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Glavni i odgovorni urednik

Zorica Živković, M.D., Msc., PhD

Zorica Živković is a paediatrician and consultant in paediatric pulmonology at Children's Hospital for Lung Diseases and Tuberculosis, Medical Center "Dr Dragiša Mišović", Belgrade, Serbia.
Dr. Živković graduated from the Medical School University of Belgrade in 1984. She received a master's degree in paediatric radiology and pulmonology at the same University in 1991. and a doctoral thesis in paediatric bronchology in 1996 from the Medical School University of Belgrade. She completed a residency in paediatrics at the Children's University Hospital in Belgrade in 1992. Her postgraduate education and expertise in paediatric pulmonology and bronchology was received in Budapest (Hospital Sombathely), Frankuft on Main (University Children's Hospital), London (King's College Hospital, Royal Brompton and Great Ormond Hospital), and Paris (Hospital Armaund Trousseu). Her main focus is paediatric pulmonology, bronchology and allergology, with a special focus on asthma, allergic rhinitis, and bronchopulmonary diseases in children. Her research interests include risk factors for early wheezing and development of childhood asthma, prenatal and postnatal factors that moderate the natural history of asthma, eosinophilic biomarkers of childhood asthma and atopy, such as exhaled nitric oxide. Additionaly, Dr Živković's interest include efficacy and long-term outcomes of pharmacological antiasthma agents in children particulary by use of allergen specific immunotherapy. Dr. Živković served at the Medical Academy/US Medical School, European University Belgrade, Serbia, where she was the full Professor in Paediatrics, Chair in Paediatrics .In addition to serving as chair of paediatrics she was the Dean of Medical Academy/US Medical School from August 2011 until March 2013.

Currently, she is a member of the Faculty of Pharmacy Novi Sad, Serbia, as full professor in Clinical Medicine, and Allergy .She has been the principal investigator in a number of groundbreaking studies in asthma and respiratory infections in children. Her clinical trials have discovered epidemiological data on prevalence of asthma and atopy in childen in Serbia and the nearby region, worldwide know International Study on Asthma and Allergy in Children (ISAAC) phase 3. She has been an active participant in decision making Task Force Groups of the European Respiratory Society, which worked on the definition of wheezing illnesses in early infancy, harmonization of paediatric respiratory medicine in Europe (paediatric HERMES), and rare diseases in childhood. Currently, her role in COST Action, (European Cooperation in Science and Technology) is national represented for project BM1407-Better Evidence to Advance Therapeutic options for PCD (BEAT-PCD) as well as a member of Management Committee
Dr. Živković was principal investigator for Serbia for the international project called SINPHONIE (Schools Indoor Pollution and Health: Observatory Network in Europe) SINPHONIE was funded by the European Parliament and carried out under a contract with the European Commission's Directorate-General for Health and Consumers (DG SANCO) (SANCO/2009/C4/04, contract SI2.570742)
Dr Živković is a member of the National Coordination Group on Asthma and COPD.

Pozdravna reč urednika

Veliko mi je zadovoljstvo da najavim prvi broj časopisa Preventivna pedijatrija, zvaničnu publikaciju Udruženja za preventivnu pedijatriju Srbije. Naš novi časopis je stručna publikacija, u kojoj će se, u skladu sa principima Udruženja, objavljivati stručni, naučni, originalni i pregledni članci iz oblasti preventivne pedijatrije, vesti i novosti i saopštenja sa kongresa i stručnih sastanaka, takodje iz oblasti prevencije. Svaki novi projekat mora imati jasnu ideju zašto nastaje. Naš novi časopis ima opravdani razlog za postojanje, pedijatri u našoj sredini imaju potrebu da se iskažu i pisanom reči, da komuniciraju u okvirima svojih istraživanja i prakse, da uspostavljaju veze sa pedijatrima iz celog sveta, i za takve snažne porive, ovaj vid publikacije će biti najbolji način. Naša pedijatrijska javnost ima mnogo toga da ponudi, da bude objavljeno i pročitano. Nadamo se da će časopis Preventivna pedijatrija ostvariti svoj cilj, izlaziti kontinuirano i u pisanoj i elektronskoj formi, i približiti stručnjake iz zemlje i inostranstva u zajedničkoj ideji, da budemo otvoreni, vidljivi i na nivou zadatka. Sa velikim poštovanjem za kolege i saradnike, koji su učestvovali u izradi ovog broja časopisa, želimo da im se zahvalimo na ambiciji, entuzijazmu i stručnosti. Nijedan pedijatar, stručnjak, naučnik ili ekspert nije sam dovoljan da dokaže svoje znanje i izuzetna mi je čast da imam podršku takvih iskusnih pedijatara kao što su članovi našeg uredjivačkog odbora i internacionalnog saveta. Nastojaćemo da ostanemo čvrsto povezan tim, otvorenih ideja i pruženih ruku za svaki dalji kontakt, napredak u nauci i inicijativu.

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Editor-in-chief welcome address

It is my great pleasure to announce the first issue of Preventive Paediatrics, the official journal of the Association of Preventive Paediatrics of Serbia. This publication intends to be the new scientific journal composed of original review articles related to preventive paediatrics published to fulfill the main goal of the association. In addition, news, updates, and reports from congresses and scientific meetings will be presented as well. Every new project should have a clear goal. Our new journal has a perfect objective for launching. Paediatricians should have a publication to express their needs, communicate and share their investigations, expertise and practice, and finally to establish international relations. For all these reasons, written material is the best way to present this information. Our national paediatric community has a lot to offer which deserves to be published and read. We hope that Preventive Paediatrics will be able to reach the main goal of continuous publication in written as well as on-line form. Furthermore, we believe that it will be able to connect experts from Serbia internationally and help in the joining of visions and ideas. With utmost respect for our colleagues and collaborators who worked on the very first issue, we would like to express our gratitude for their ambition, enthusiasm, and expertise. Paediatricians, scientists and experts cannot all work alone and we are pleased to have the support of such superb and experienced paediatricians from our Editorial as well as our International Board. We will keep our team tightly connected, but still open to original ideas from new contacts, developments, and initiatives.

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PREGLED LITERATURE – REVIEW ARTICLE

Paediatric Well Child Care in the First Year of Life

Pedijatrijski pregledi i imunizacija u prvoj godini života

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Summary Well child care is a discipline within paediatrics that evaluates the progression of a patient's nutrition, development, psychosocial advancement, physical examination, and immunization status at specific time points throughout childhood. One vital component of well child care is to designate time for age-appropriate anticipatory guidance about upcoming developmental milestones; therefore promoting optimal health and preventing injury. Many countries developed nationally recognized preventive programs for the first year of life including the immunization schedule. In many countries worldwide general practice physicians and/or nurses supervise child development and immunizations. The article summarizes well child care in the United States in the first year of life recommendations provided by The American Academy of Paediatrics.

Key words: infants, development, immunization

Sažetak Razvojna pedijatrija je posebna disciplina u okviru pedijatrije, koja se bavi praćenjem rasta i razvoja deteta, ishranom , psihosocijalnim aspektom, sistematskim pregledima i imunizacijom. Jedan od zadataka razvojne pedijatrije je utvrditi kliničke vodiče koji omogućavaju praćenje razvojnih karakteristika prema uzrastu , ali i ostali zadaci su bitni - promocija optimalnog zdravstvenog stanja i prevencija povredjivanja.Mnoge zemlje imaju nacionalne programe za preventivnu pedijatriju u prvoj godini života, uključujući i precizno definisane šeme imunizacije. U nekim zemljama, ovaj posao sprovode lekari opšte prakse i /ili obučene meidinske sestre. Imajući u vidu , razlike u izvodjenju ovih programa preventivne pedijatrije u Sjedinjenim američkim državama, želimo da iznesemo preporuke koje je izdalo Američko udruženje za pedijatriju.

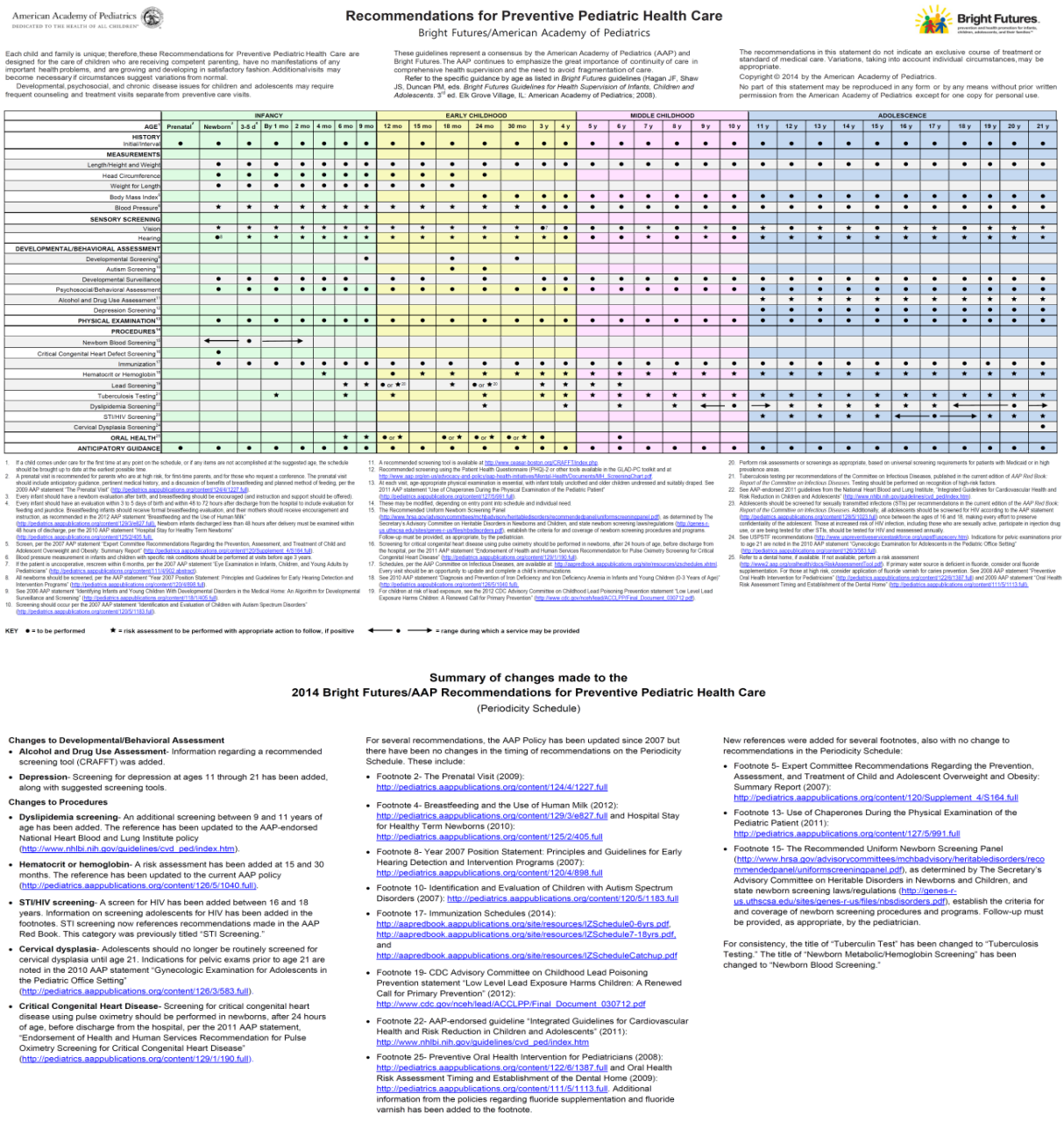
Ključne reči: deca, razvoj, imunizacija

Introduction

Paediatricians have the privilege to help build a child's foundation in health that will guide them into adulthood (1). Well child care is a discipline within paediatrics that evaluates the progression of a patient's nutrition, development, psychosocial advancement, physical examination, and immunization status at specific time points throughout childhood. One vital component of well child care is to designate time for age-appropriate anticipatory guidance about upcoming developmental milestones; therefore promoting optimal health and preventing injury (1). Many European countries, such as France and Sweden, have general practice physicians and/or designated nurses that supervise general development and immunizations, only referring patients to a paediatrician for care outside their scope of practice (2). In the United States, paediatricians provide both well child care and treat acute illnesses in a primary care setting, an established "medical home".

The American Academy of Paediatrics (AAP) and *Bright Futures* recommend that children receive twenty-nine well child visits between birth and 21 years of age (Figure 1); eleven of them within the first three years of life (1). This article outlines paediatric well child care in America in the first year of life, with recommended visits at birth, 1 month, 2 months, 4 months, 6 months, 9 months, and 12 months of age.

In America, well child care begins before newborn hospital discharge and is focused on disease screening. All neonates receive the newborn screening panel blood test, a state-dependent selection of diseases with results tracked in a national registry. This screening focuses on illnesses where proper early therapy can slow disease progression and improve outcomes (3). Panels concentrate on conditions such as, cystic fibrosis, sickle cell anemia, congenital hypothyroidism, and inborn errors of metabolism (3). The next preventative testing is critical congenitalheart disease (CCHD) screening, performed when the patient is greater than 24 hours old. By obtaining pre- and post-ductal



American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN™

Recommendations for Preventive Pediatric Health Care

Bright Futures/American Academy of Pediatrics

Bright Futures.
prevention and health promotion for infants, children, adolescents, and their families™

Each child and family is unique; therefore, these Recommendations for Preventive Pediatric Health Care are designed for the care of children who are receiving competent parenting, have no manifestations of any important health problems, and are growing and developing in satisfactory fashion. Additional visits may become necessary if circumstances suggest variations from normal.

Developmental, psychosocial, and chronic disease issues for children and adolescents may require frequent counseling and treatment visits separate from preventive care visits.

These guidelines represent a consensus by the American Academy of Pediatrics (AAP) and Bright Futures. The AAP continues to emphasize the great importance of continuity of care in comprehensive health supervision and the need to avoid fragmentation of care.

Refer to the specific guidance by age as listed in *Bright Futures* guidelines (Hagan JF, Shaw JS, Duncan PM, eds. *Bright Futures Guidelines for Health Supervision of Infants, Children and Adolescents*. 3rd ed. Elk Grove Village, IL: American Academy of Pediatrics; 2008).

	INFANCY								EARLY CHILDHOOD							MIDDLE CHILDHOOD						ADOLESCENCE										
AGE[1]	Prenatal[1]	Newborn[1]	3-5 d[1]	By 1 mo	2 mo	4 mo	6 mo	9 mo	12 mo	15 mo	18 mo	24 mo	30 mo	3 y	4 y	5 y	6 y	7 y	8 y	9 y	10 y	11 y	12 y	13 y	14 y	15 y	16 y	17 y	18 y	19 y	20 y	21 y
HISTORY Initial/Interval	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
MEASUREMENTS																															
Length/Height and Weight		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Head Circumference		●	●	●	●	●	●		●	●	●	●																			
Weight for Length		●	●	●	●	●	●		●	●	●																				
Body Mass Index[2]												●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Blood Pressure[3]		★	★	★	★	★	★	★	★	★	★	★	★	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
SENSORY SCREENING																															
Vision[4]		★	★	★	★	★	★	★	★	★	★	★	★	●[7]	●	●	●	★	●	★	●	★	●	★	★	●	★	★	●	★	★	★
Hearing[5]		●[6]	★	★	★	★	★	★	★	★	★	★	★	★	●	●	●	★	●	★	●	★	★	★	★	★	★	★	★	★	★	★
DEVELOPMENTAL/BEHAVIORAL ASSESSMENT																															
Developmental Screening[8]								●			●		●																		
Autism Screening[9]											●	●																			
Developmental Surveillance		●	●	●	●	●	●		●	●		●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Psychosocial/Behavioral Assessment		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	★	★	★	★	★	★	★	★	★	★
Alcohol and Drug Use Assessment[10]																						★	★	★	★	★	★	★	★	★	★
Depression Screening[10]																						●	●	●	●	●	●	●	●	●	●
PHYSICAL EXAMINATION[11]		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
PROCEDURES[12]																															
Newborn Blood Screening[13]		⟵	●	⟶																											
Critical Congenital Heart Defect Screening[14]		●																													
Immunization[15]		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hematocrit or Hemoglobin[16]						★			●	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★
Lead Screening[17]							★	★	● or ★[20]		★	● or ★[20]		★	★	★	★															
Tuberculosis Testing[21]				★			★		★			★		★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★
Dyslipidemia Screening[22]												★		★	★				★	⟵	●	⟶	★	★	★	★	★	★	⟵	●	⟶	★
STI/HIV Screening[23]																						★	★	★	★	★	⟵	●	⟶	★	★	★
Cervical Dysplasia Screening[24]																															●	
ORAL HEALTH[25]							★	★	● or ★		● or ★	● or ★	● or ★	●			●														
ANTICIPATORY GUIDANCE	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

1. If a child comes under care for the first time at any point on the schedule, or if any items are not accomplished at the suggested age, the schedule should be brought up to date at the earliest possible time.
2. A prenatal visit is recommended for parents who are at high risk, for first-time parents, and for those who request a conference. The prenatal visit should include anticipatory guidance, pertinent medical history, and a discussion of benefits of breastfeeding and planned method of feeding, per the 2009 AAP statement "The Prenatal Visit" (http://pediatrics.aappublications.org/content/124/4/1227.full).
3. Every infant should have a newborn evaluation after birth, and breastfeeding should be encouraged (and instruction and support should be offered).
4. Every infant should have an evaluation within 3 to 5 days of birth and within 48 to 72 hours after discharge from the hospital to include evaluation for feeding and jaundice. Breastfeeding infants should receive formal breastfeeding evaluation, and their mothers should receive encouragement and instruction, as recommended in the 2012 AAP statement "Breastfeeding and the Use of Human Milk" (http://pediatrics.aappublications.org/content/129/3/e827.full). Newborn infants discharged less than 48 hours after delivery must be examined within 48 hours of discharge, per the 2010 AAP statement "Hospital Stay for Healthy Term Newborns" (http://pediatrics.aappublications.org/content/125/2/405.full).
5. Screen, per the 2007 AAP statement "Expert Committee Recommendations Regarding the Prevention, Assessment, and Treatment of Child and Adolescent Overweight and Obesity: Summary Report" (http://pediatrics.aappublications.org/content/120/Supplement_4/S164.full).
6. Blood pressure measurement in infants and children with specific risk conditions should be performed at visits before age 3 years.
7. If the patient is uncooperative, rescreen within 6 months, per the 2007 AAP statement "Eye Examination in Infants, Children, and Young Adults by Pediatricians" (http://pediatrics.aappublications.org/content/111/4/902.abstract).
8. All newborns should be screened, per the AAP statement "Year 2007 Position Statement: Principles and Guidelines for Early Hearing Detection and Intervention Programs" (http://pediatrics.aappublications.org/content/120/4/898.full).
9. See 2006 AAP statement "Identifying Infants and Young Children With Developmental Disorders in the Medical Home: An Algorithm for Developmental Surveillance and Screening" (http://pediatrics.aappublications.org/content/118/1/405.full).
10. Screening should occur per the 2007 AAP statement "Identification and Evaluation of Children with Autism Spectrum Disorders" (http://pediatrics.aappublications.org/content/120/5/1183.full).
11. A recommended screening tool is available at http://www.ceasar-boston.org/CRAFFT/index.php.
12. Recommended screening using the Patient Health Questionnaire (PHQ)-2 or other tools available in the GLAD-PC toolkit and at http://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/Mental-Health/Documents/MH_ScreeningChart.pdf.
13. At each visit, age-appropriate physical examination is essential, with infant totally unclothed and older children undressed and suitably draped. See 2011 AAP statement "Use of Chaperones During the Physical Examination of the Pediatric Patient" (http://pediatrics.aappublications.org/content/127/5/991.full).
14. These may be modified, depending on entry point into schedule and individual need.
15. The Recommended Uniform Newborn Screening Panel (http://www.hrsa.gov/advisorycommittees/mchbadvisory/heritabledisorders/recommendedpanel/uniformscreeningpanel.pdf), as determined by The Secretary's Advisory Committee on Heritable Disorders in Newborns and Children, and state newborn screening laws/regulations (http://genes-r-us.uthscsa.edu/sites/genes-r-us/files/nbsdisorders.pdf), establish the criteria for and coverage of newborn screening procedures and programs. Follow-up must be provided, as appropriate, by the pediatrician.
16. Screening for critical congenital heart disease using pulse oximetry should be performed in newborns, after 24 hours of age, before discharge from the hospital, per the 2011 AAP statement "Endorsement of Health and Human Services Recommendation for Pulse Oximetry Screening for Critical Congenital Heart Disease" (http://pediatrics.aappublications.org/content/129/1/190.full).
17. Schedules, per the AAP Committee on Infectious Diseases, are available at http://redbook.aappublications.org/site/resources/izschedules.xhtml. Every visit should be an opportunity to update and complete a child's immunizations.
18. See 2010 AAP statement "Diagnosis and Prevention of Iron Deficiency and Iron-Deficiency Anemia in Infants and Young Children (0-3 Years of Age)" (http://pediatrics.aappublications.org/content/126/5/1040.full).
19. For children at risk of lead exposure, see the 2012 CDC Advisory Committee on Childhood Lead Poisoning Prevention statement "Low Level Lead Exposure Harms Children: A Renewed Call for Primary Prevention" (http://www.cdc.gov/nceh/lead/ACCLPPF/inal_Document_030712.pdf).
20. Perform risk assessments or screenings as appropriate, based on universal screening requirements for patients with Medicaid or in high prevalence areas.
21. Tuberculosis testing per recommendations of the Committee on Infectious Diseases, published in the current edition of *AAP Red Book: Report of the Committee on Infectious Diseases*. Testing should be performed on recognition of high-risk factors.
22. See AAP-endorsed 2011 guidelines from the National Heart Blood and Lung Institute, "Integrated Guidelines for Cardiovascular Health and Risk Reduction in Children and Adolescents" (http://www.nhlbi.nih.gov/guidelines/cvd_ped/index.htm).
23. Adolescents should be screened for sexually transmitted infections (STIs) per recommendations in the current edition of the *AAP Red Book: Report of the Committee on Infectious Diseases*. Additionally, all adolescents should be screened for HIV according to the AAP statement (http://pediatrics.aappublications.org/content/128/5/1023.full) once between the ages of 16 and 18, making every effort to preserve confidentiality of the adolescent. Those at increased risk of HIV infection, including those who are sexually active, participate in injection drug use, or are being tested for other STIs, should be tested for HIV and reassessed annually.
24. See USPSTF recommendations (http://www.uspreventiveservicestaskforce.org/uspstf/uspscerv.htm). Indications for pelvic examinations prior to age 21 are noted in the 2010 AAP statement "Gynecologic Examination for Adolescents in the Pediatric Office Setting" (http://pediatrics.aappublications.org/content/126/3/583.full).
25. Refer to a dental home, if available. If not available, perform a risk assessment (http://www2.aap.org/oralhealth/docs/RiskAssessmentTool.pdf). If primary water source is deficient in fluoride, consider oral fluoride supplementation. For those at high risk, consider application of fluoride varnish for caries prevention. See 2008 AAP statement "Preventive Oral Health Intervention for Pediatricians" (http://pediatrics.aappublications.org/content/122/6/1387.full) and 2009 AAP statement "Oral Health Risk Assessment Timing and Establishment of the Dental Home" (http://pediatrics.aappublications.org/content/111/5/1113.full).

KEY ● = to be performed ★ = risk assessment to be performed with appropriate action to follow, if positive ⟵ ● ⟶ = range during which a service may be provided

Summary of changes made to the
2014 Bright Futures/AAP Recommendations for Preventive Pediatric Health Care
(Periodicity Schedule)

Changes to Developmental/Behavioral Assessment

- **Alcohol and Drug Use Assessment**- Information regarding a recommended screening tool (CRAFFT) was added.
- **Depression**- Screening for depression at ages 11 through 21 has been added, along with suggested screening tools.

Changes to Procedures

- **Dyslipidemia screening**- An additional screening between 9 and 11 years of age has been added. The reference has been updated to the AAP-endorsed National Heart Blood and Lung Institute policy (http://www.nhlbi.nih.gov/guidelines/cvd_ped/index.htm).
- **Hematocrit or hemoglobin**- A risk assessment has been added at 15 and 30 months. The reference has been updated to the current AAP policy (http://pediatrics.aappublications.org/content/126/5/1040.full).
- **STI/HIV screening**- A screen for HIV has been added between 16 and 18 years. Information on screening adolescents for HIV has been added in the footnotes. STI screening now references recommendations made in the AAP Red Book. This category was previously titled "STI Screening."
- **Cervical dysplasia**- Adolescents should no longer be routinely screened for cervical dysplasia until age 21. Indications for pelvic exams prior to age 21 are noted in the 2010 AAP statement "Gynecologic Examination for Adolescents in the Pediatric Office Setting" (http://pediatrics.aappublications.org/content/126/3/583.full).
- **Critical Congenital Heart Disease**- Screening for critical congenital heart disease using pulse oximetry should be performed in newborns, after 24 hours of age, before discharge from the hospital, per the 2011 AAP statement, "Endorsement of Health and Human Services Recommendation for Pulse Oximetry Screening for Critical Congenital Heart Disease" (http://pediatrics.aappublications.org/content/129/1/190.full).

For several recommendations, the AAP Policy has been updated since 2007 but there have been no changes in the timing of recommendations on the Periodicity Schedule. These include:

- Footnote 2- The Prenatal Visit (2009): http://pediatrics.aappublications.org/content/124/4/1227.full
- Footnote 4- Breastfeeding and the Use of Human Milk (2012): http://pediatrics.aappublications.org/content/129/3/e827.full and Hospital Stay for Healthy Term Newborns (2010): http://pediatrics.aappublications.org/content/125/2/405.full
- Footnote 8- Year 2007 Position Statement: Principles and Guidelines for Early Hearing Detection and Intervention Programs (2007): http://pediatrics.aappublications.org/content/120/4/898.full
- Footnote 10- Identification and Evaluation of Children with Autism Spectrum Disorders (2007): http://pediatrics.aappublications.org/content/120/5/1183.full
- Footnote 17- Immunization Schedules (2014): http://aapredbook.aappublications.org/site/resources/IZSchedule0-6yrs.pdf, http://aapredbook.aappublications.org/site/resources/IZSchedule7-18yrs.pdf, and http://aapredbook.aappublications.org/site/resources/IZScheduleCatchup.pdf
- Footnote 19- CDC Advisory Committee on Childhood Lead Poisoning Prevention statement "Low Level Lead Exposure Harms Children: A Renewed Call for Primary Prevention" (2012): http://www.cdc.gov/nceh/lead/ACCLPP/Final_Document_030712.pdf
- Footnote 22- AAP-endorsed guideline "Integrated Guidelines for Cardiovascular Health and Risk Reduction in Children and Adolescents" (2011): http://www.nhlbi.nih.gov/guidelines/cvd_ped/index.htm
- Footnote 25- Preventive Oral Health Intervention for Pediatricians (2008): http://pediatrics.aappublications.org/content/122/6/1387.full and Oral Health Risk Assessment Timing and Establishment of the Dental Home (2009): http://pediatrics.aappublications.org/content/111/5/1113.full. Additional information from the policies regarding fluoride supplementation and fluoride varnish has been added to the footnote.

New references were added for several footnotes, also with no change to recommendations in the Periodicity Schedule:

- Footnote 5- Expert Committee Recommendations Regarding the Prevention, Assessment, and Treatment of Child and Adolescent Overweight and Obesity: Summary Report (2007): http://pediatrics.aappublications.org/content/120/Supplement_4/S164.full
- Footnote 13- Use of Chaperones During the Physical Examination of the Pediatric Patient (2011): http://pediatrics.aappublications.org/content/127/5/991.full
- Footnote 15- The Recommended Uniform Newborn Screening Panel (http://www.hrsa.gov/advisorycommittees/mchbadvisory/heritabledisorders/recommendedpanel/uniformscreeningpanel.pdf), as determined by The Secretary's Advisory Committee on Heritable Disorders in Newborns and Children, and state newborn screening laws/regulations (http://genes-r-us.uthscsa.edu/sites/genes-r-us/files/nbsdisorders.pdf), establish the criteria for and coverage of newborn screening procedures and programs. Follow-up must be provided, as appropriate, by the pediatrician.

For consistency, the title of "Tuberculin Test" has been changed to "Tuberculosis Testing." The title of "Newborn Metabolic/Hemoglobin Screening" has been changed to "Newborn Blood Screening."

Figure 1. Recommendations for Preventive Paediatric Health Care

oxygen saturations, usually in the right hand and one foot, critical cyanotic heart lesions can be identified that may have been missed on prenatal ultrasound (4).

A pulse oximetry reading greater than or equal to 95% in either extremity with a less than or equal to 3% difference between extremities is considered a pass; any failed screen requires further testing and/or evaluation by a paediatric cardiologist (4). Finally, the AAP recommends all babies receive a hearing screen within the first month of life called Auditory Brainstem Evoked Response testing or ABER (5). This testing evaluates a baby's brain response to sound, even while the infant is sleeping. Most infants have this performed before hospital discharge and will follow up with audiology for a failed screen. Any infant identified with hearing impairment should receive therapy by six months of age; thus fostering speech and language skills, academic progression, and social-emotional development (5).

After hospital discharge, preventative care continues with a primary care paediatrician. The first office visit is at about 3-5 days of life to establish care and evaluate feeding, weight, and jaundice risk factors (6). Anticipatory guidance by the paediatrician addresses issues including car seat safety, tobacco avoidance, and safe sleep. Families are also educated that a fever of 38 Celsius or greater is considered a medical emergency requiring medical evaluation for sepsis. Finally, the first vaccine recommended by the Centers for Disease Control and Prevention immunization

schedule is for Hepatitis B, given either upon hospital discharge or during this first appointment (7).

The next recommended visit by the AAP is by one month of life to again monitor growth during this critical time of development (6). For these and all future visits, referenced by Figure 1, the AAP recommends evaluation of length, weight, head circumference, and weight for length growth parameters. These values are plotted on growth curves and percentiles are followed at each future visit. In addition, vision, hearing, and developmental and behavioral assessments are completed. Anticipatory guidance at this age reinforces the teaching from birth and after hospital discharge.

Subsequent visits for examination and immunization are at two, four, and six months of age. Growth and development are again assessed while providing evaluation of age-specific milestones (6). Anticipatory guidance focuses on prevention of Sudden Infant Death Syndrome (SIDS), proper nutrition, and illness prevention. Early on, sleep routines are discussed with parents encouraging babies to be placed on their backs to sleep.

At the four month visit, paediatricians will discuss the introduction of solid food often beginning with rice cereal. Before babies become mobile, safety proofing of the home is an important topic to be addressed to prevent infant injury. Scheduled vaccines at these three visits include Rotavirus, Hepatitis B, Diphtheria, Tetanus, Acellular Pertussis, Haemophilus Influenza Type B, Pneumococcal Conjugate Valence 13, and inactivated Poliovirus. During influenza season, the first vaccine dose can be given at 6 months of age with a second dose 4 weeks later (7).

The next well-child visit at 9 months focuses specifically on childhood development. Specific screening measures are utilized to evaluate parental observation of milestone attainment. The Parents' Evaluation of Developmental Status (PEDS) is a screening tool used to identify delays and problems in behavior that may need further evaluation (8). It focuses on gross and fine motor development and communication skills. Example questions include evaluating for eye contact and pincer grasp at 9 months of age. By identifying deficiencies, children can be referred for more testing and/or therapy. Early intervention is vital in ensuring the child reaches their full neurodevelopmental potential (8). Resources are provided at the state level until preschool age. Anticipatory guidance continues to address the safety of a very active baby who may already be crawling. The paediatrician will also likely encourage foods with a variety of textures and starting healthy snacks. There are often no vaccinations given at the 9 month visit, though this is clinic dependent.

The final preventative visit of the first year is at 12 months. In addition to routine assessments, the one year well child visit consists of screening for iron deficiency anemia and lead poisoning that can lead to neurologic impairment (9). In the United States, lead poisoning found in house paint is a primary cause of anemia and families are routinely educated about this hazard. This is also the appropriate time for fluoride varnish to be applied to teeth, either in the dentist or paediatrician's office. When applied every 6 months up to 3 years of age, fluoride treatment reduces caries by 38% over a two year span (10). If they have not yet started, children are encouraged to start brushing teeth at last two times a day. Paediatricians also prepare parents for the upcoming milestones of walking and language acquisition emphasizing a safe environment free of potential harm. Finally, this visit includes first doses of Measles, Mumps, Rubella, Varicella, and Hepatitis A vaccines (7).

Well child visits are the cornerstone of preventative paediatric care. The physician spends these appointments evaluating the health of the child and providing education to the entire family. By having well-established guidelines established by the AAP, paediatricians can monitor growth and development at fixed intervals and provide age-specific screening. Delivery of thorough and effective well child care allows paediatricians to assist children and their parents prevent illness and develop healthy habits that will follow them for a lifetime.

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References:

1. Coker T, Thomas T, Chung P. Does Well-Child Care Have a Future in Paediatrics? Paediatrics. 2013; 131: S149-S159. DOI 10.1542/peds.2013-0252f
2. Kuo A, Inkelas M, Lotstein D, Samson K, Schor E, Halfon N. Rethinking Well-Child Care in the United States: An International Comparison. Paediatrics. 2006; 118: 1692-1702.DOI 10.1542/peds.2006-0620
3. Watson M, Mann M, Lloyd-Puryear M, Rinaldo P, Howell R. American College of Medical Genetics Newborn Screening Expert Group.Newborn Screening: Towards a Uniform Screening Panel and System-Executive Summary. Paediatrics. 2006; 117: S296-S307. DOI 10.1542/peds.2005-2633l
4. Section on Cardiology and Cardiac Surgery Executive Committee, Mahle W, Martin G, Beekman R, Morrow W, Rosenthal G, Snyder C et al. Endorsement of Health and Human Services Recommendation for Pulse Oximetry Screening for Critical Congenital Heart Disease. Paediatrics. 2012; 129; 190-192. DOI 10.1542/peds.2011-3211
5. Joint Committee on Infant Hearing. Year 2007 Position Statement: Principles and Guidelines for Early Hearing Detection and Intervention Programs. Paediatrics. 2007; 120:898-916. DOI10.1542/peds.2007-2333
6. Hagan J, Shaw J, Duncan P. Bright Futures. 3rd Edition. Elk Grove Village, IL: American Academy of Paediatrics; 2007: 1-650. Copyright © 2007 American Academy of Paediatrics. Reproduced with permission. DOI: 10.1542/peds.2013-3965
7. Centers for Disease Control and Prevention, Nationalhttp://www.cdc.gov/ncird/Centerhttp://www.cdc.gov/nci

rd/forhttp://www.cdc.gov/ncird/Immunizationhttp://www.cdc.gov/ncird/andhttp://www.cdc.gov/ncird/Respiratoryhttp://www.cdc.gov/ncird/Diseases. Immunization guidelines birth to 6 years. 2015.

8. American Academy of Paediatrics. Policy Statement: Identifying Infants and Young Children with Developmental Disorders in the Medical Home: An Algorithm for Developmental Surveillance and Screening. Paediatrics. 2006; 118: 405-420. DOI 10.1542/peds.2006-1231
9. Baker R, Greer F. The Committee on Nutrition. Clinical Report – Diagnosis and Prevention of Iron Deficiency and Iron-Deficiency Anemia in Infants and Young Children (0-3 Years of Age). Paediatrics. 126: 1040-1050. DOI 10.1542/peds.2010-2576
10. Hawkins R, Locker D, Noble J. Prevention. Part 7: Professionally applied topical fluorides for caries prevention. British Dental Journal. 2003; 195: 313-317. DOI 10.1038/sj.bdj.4810527

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PREGLED LITERATURE – REVIEW ARTICLE

Perinatal Autopsy and Placental Examination an Important Contribution to Diagnosis and Follow-up after a Fetal Loss

Prenatalna autopsija i ispitivanje placente kao važan doprinos dijagnostici i praćenju nakon gubitka ploda

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Summary Fetopathology is the study of fetal deaths or eventually developmental anomalies occurring during early or late pregnancy. The major objectives of the fetal or perinatal autopsy are to evaluate gestational age, document growth and development, detect congenital abnormalities, analyze clinical diagnosis and treatment and determine the cause of death and possible recurrence risk. It must be associated to the analysis of the placenta to respond to questions concerning the cause of death or risks of recurrence in a subsequent pregnancy. The analysis follows a well-developped protocol and the results have to be interpreted by a multidisciplinary group including the obstetrician, the genetist, the neonatologist and the pathologist.

Key words: fetal autopsy, cause of death, placental examination

Sažetak Fetopatologija je nauka o razvojnim anomalijama fetusa ili fetalnoj smrti koje se javljaju tokom rane ili kasnije trudnoće. Osnovni cill fetalne ili perinatalne biopsije je da se utvrdi gestacijska starost, utvrdi stepen razvoja ploda, utvrdi prisustvo kongenitalnih anomalija, analizira klinička dijagnoza i sprovedena terapija, kao i da se utvrdi uzrok smrti i mogući rizik od ponovljene fetalne smrti. Obavezno se ispituje i stanje placente, kako bi se utvrdio uzro fetalne smrti i rizik u sledećoj trudnoći. Analize se sprovode po strogo odredjenim protokolima, a rezultati se interpretiraju multidiciplinarnim pristupom, u kome učestvuju akušeri, genetičari, neonatolozi i patolozi.

Ključne reči: fetalna autopsija, uzrok smrti, ispitivanje placente

Introduction

Pregnancy loss is one of the most common obstetrics complications affecting over 30% of conceptions. Most of them occur in the first trimester of gestation and are due essentially to problems with implantation or chromosomal anomalies and may not be clinically apparent.

However 12-15% of conceptions result in clinically recognized pregnancy loss. Fewer than 5% of pregnancies are lost after 10 weeks of gestation. The late fetal deaths are particularly devastating for families and clinicians. And answers to several questions are needed.

For the clinicians, what is the cause of the death? were complications of therapy? what is the recurrence risk? For the families, why did my baby die? Did I do something wrong? Will this happen again?

The autopsy of the fetus as well the placental examination can help by providing informations which can answer to some of these questions.

Aim of the Patologist

For a perinatal pathologist the main goal of the perinatal autopsy dissection is to characterize all pathologic findings (Figure 1) (1).

Fetal death is defined as death prior to the complete extraction or expulsion from its mother of a product of conception irrespective of the duration of pregnancy.

It is divided in early (<22 weeks of gestation), intermediate (between 22 and 27 weeks of gestation) and late (> 28 weeks of gestational age). Of these, early are designated as abortions whereas intermediate and late are known as stillbirths (2).

The key objectives of autopsy examination are identification of causes of death, elucidation of pathogenic mechanisms and quality control of clinical mechanism. Therefore a well-developed protocol must be followed and the results have to be interpreted by a multidisciplinary group including obstetricians, geneticists, neonatologists and the pathologist.

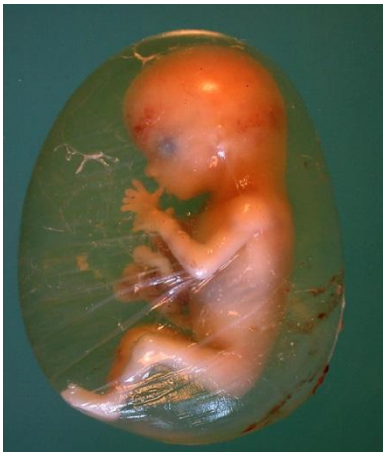

Figure 1: Well developped fetus in his amniotic cavity

Perinatal Autopsy Procedure

Before the autopsy, the pathologist must check the type of consent given, consult the clinicians, determine the questions that have to be answered and collect the informations about the pregnancy, gynecological history from the mother and fetal development (ultrasounds, laboratory tests, age of gestation and any data susceptible to help the interpretation of the autopsy findings).

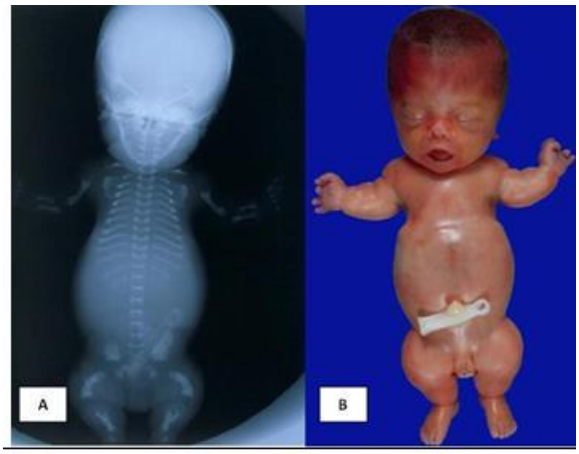

Figure 2. Fetus with thanatophoric dysplasia. X-rays showing skelettal dysplasia (A) and External view of the same fetus (B

It is important to receive a well preserved material (fetus and placenta). Then the external and internal examination must be performed after having obtained radiographs and photographs of the fetus and if necessary having proceeded to genetic analyses (3;4).
Photographs: External photographs of the perinate must be taken showing the full body features (antero-posterior and lateral) with close-ups of the face, hands, feets, external genitalia and any abnormalities found.

Radiographs: The main use of the X-rays is to assess primary ossification centers as a measure of fetal maturation, bone length as a measure of fetal growth and to detect bone abnormalities (Figure 2) (5; 6).

External examination: Measurements of crown heel, crown rump, head circumference, foot length and weight are taken for comparison with standard charts (7). A discrepancy of 20 mm indicates microcephaly or macrocephaly or a disproportionate body. Facial dysmorphism, inner and outer canthal distances are helpful.

For an appropriate examination of the fetus or infant a checklist is necessary. Some examples of findings will illustrates the importance of a well-followed protocol (8).

- *Head and skull:* Bulging fontanelles indicate, intracranial disorder. Defect of the scalp are seen in trisomy 13.
- *Skin:* Multiple hemangiomas suggest Osler-Rendu-Weber syndrome; leaf-shaped café-au-lait spots, a tuberous sclerosis. Meconium staining of the skin or orifices indicates intrauterine hypoxia.
- *Face*: Cataracts may be present in congenital infections as well as in systemic diseases, genetic or metabolism errors. Hypertelorism with short palpebral fissures, short nose, long smooth philtrum and thin upper lip are found in fetal alcool syndrome. A proboscis with a cyclopic eye is frequent in trisomy 13. Choanal atresia, coloboma, heart disease, retarded growth and development are seen in CHARGE syndrome. Micrognathia or retrognathia are often seen in aneuploidy.
- *Neck*: Multiple ptérygium syndrome or postnuchal cystic hygrome occurs in monosomy XO, trisomy 21 and trisomy 18. A posterior midline swelling or defect could be due to a cervical meningocoele (Figure 3) (9).

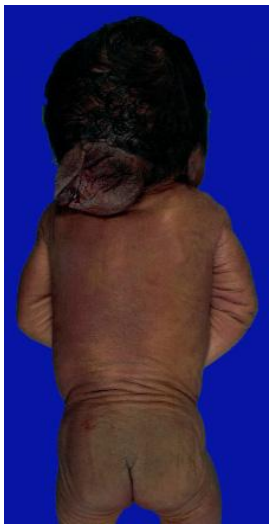

Figure 3: Cervical myelomeningocele

- *Chest*: A small abnormal shaped chest with short ribs is present in skeletal dysplasias (Figure 2).
- *Abdomen*: Abdomen distention can be due to ascites, organomegaly, intestinal obstruction or tumor.

- *Extremities:* Simian crease, sandal gap, typically occur in trisomy 21, polydactyly in trisomy 13 and some skeletal dysplasias. Overgrowth of a digit occurs in Proteus syndrome.
- *Genitalia*: External malformed or ambiguous genitalia can be associated with renal and anal anomalies.

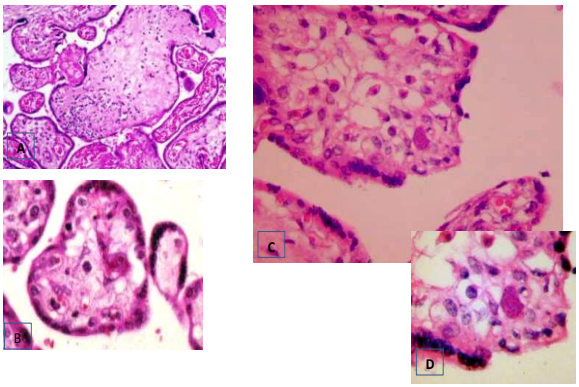

Figure 4. Placental infections:
. (A; B) viral inclusions of cytomegalovirus
. (C;D), toxoplasma cyst

Dissection

Standard neonatal textbooks explain in details the various dissection techniques. A systematic dissection of all internal organs must be conducted with care in order to visualize their locations and their interractions. A removal of the organs «en bloc» from the body cavity and separation of the organs in a second time remains the best technique to perform an optimal macroscopic examination. All the organs will be weighed and small samples of tissues will be submitted for histological analysis. Removal of the brain and the spinal cord will complete the dissection.

Placental Examination

Placental examination is required as an important part of the perinatal autopsy (10; 11). Findings of placental insufficience (12) and fetal vascular obstruction/umbilical cord pathology are important findings in stillbirth related to cause of death (10) as well as the presence of placental infections (chorioamnionitis). In addition, placental examination in the midtrimester of pregnancy can also inform about a preterm delivery in previable fetuses (13).

A systematic analysis applies also to the placental examination. The umbilical cord, then the amniotic membranes, the fetal and maternal surfaces must be described and sampled. Hypercoiling of the umbilical cord indicates hypoxia. Chorioamnionitis is the most common placental lesion associated with cerebral palsy and preterm infants (14). Extensive placental infarction correlates with ischemic cerebral injury, particularly periventricular white matter necrosis in stillbirths.

Special Techniques

Special techniques may be required to make a definitive diagnosis such as cytogenetic analyses, fluorescent in situ hybridization for chromosomal abnormalities or PCR for detection of common and unusual infectious agents like Toxoplasma gondii, Rubella, Cytomegalovirus, Herpes simplex, Parvovirus B19 (15) or Coxsakie virus, Trypanosoma cruzi, Treponema pallidum (Figure 4) (16).
If a metabolic disorder is suspected, tissue samples need to be taken within 4-6 hours of death. Skin for fibroblasts culture should be placed in growth media at room temperature, muscle, heart, brain, liver should be frozen and taken for electron microscopy.

Conclusion

Fetal death remains a common, traumatic and in some cases preventable complication of pregnancy.

Common causes for fetal death include chromosomal abnormalities, genetic syndromes, infections, maternal diseases and abnormalities of multiple gestation.

Pathologic examination can confirm clinical diagnosis or provide definitive diagnosis.

Clinicians should encourage investigations of potential causes of fetal death to facilitate emotional closure and to asses recurrence risks.

References

1. Ernst LM, Gawron L, Fritsch MK. Pathologic examination of fetal and placental tissue obtained by dilation and evacuation Arch. Pathol. Lab. Med 2013; 137: 326-337
2. Ernst LM. A pathologist's perspective on the perinatal autopsy. Seminars in Perinatology 2015; 30: 55-63
3. Meagher-Villemure K, Osterheld MC.La foetopathologie : son rôle. 2. Le fœtus : ses énigmes. Medecine et Hygiène 2001; 59: 2162-2168
4. Osterheld MC, Meagher-Villemure K. La foetopathologie : son rôle. 2. Le placenta : une interface. Medecine et Hygiène 2001; 59: 2171-2172
5. Olsen EO, Espeland A, Maartmann-Moe H et al. Diagnostic value of radiography in cases of perinatal death : a population based study. Arch. Dis. Child Fetal Neonatal Ed. 2003; 88: 52-54
6. Arthurs OJ, Calder AD, Kiho L, Taylor AM, Sebire NJ. Routine perinatal and paediatric postmortem radiography : detection rates and implications for practice Pediatr. Radiol. 2014; 44(3): 252-257
7. Hansen K, Sung CJ, Huang C et al. Reference values for second trimester fetal and neonatal organ weights and measurements. Pediatr. Dev. Pathology 2003; 6: 160-167
8. Sankar VH, Phadke SR. Clinical utility of fetal autopsy and comparison with prenatal ultrasound findings. Journal of Perinatology 2006; 26: 224-229

9. Papp C, Szigcti Z, Jao JG, Toth-Pal E, Hajdu J, Papp Z. The role of perinatal autopsy in the management of pregnancies with major fetal trisomies Pathology-Research and Practice 2007; 203(7): 525-531
10. Uroos F, Rana S, Taukin K, Sufian Z. Fœtal autopsy-categories and causes of death. Journal of Clinical and Diagnostic Research 2014; 8(10): 5-8
11. Regiani Bonetti L, Ferrari P et al. The role of fetal autopsy and placental examination in the causes of fetal death: a retrospective study of 132 cases of stillbirths. Archives of Gynecology and Obstetrics 2011; 283(2): 231-241
12. Menghrajani P, Osterheld MC. Significance of hemorrhagic endovasculitis in placentae from stillbirths. Pathol. Res. Pract. 2008; 204 (6): 389-394
13. Srinivas SK, Ernst LM, Edlow AG, Elovitz MA. Can placental pathology explain second-trimester outcomes ? Am. J. Obst. Gynecol. 2008; 199(4): 4021-4025
14. Quinn PA, Butany J, Chipman M et al. A prospective study of microbial infection in stillbirths and neonatal death. AJOG 1985; 151: 238-249
15. De Kriger PR, van Elsacker-Niele AMW, Mulder-Stapel A et al. Detection of Parvovirus B19 injection in first and second trimester fetal loss, Pediatr. Pathol. Lab. Med. 1998; 18: 23-24
16. Wainwright HC. My approach to performing a perinatal or neonatal autopsy. Journal of Clinical Pathology 2006; 59: 673-680

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PREGLED LITERATURE – REVIEW ARTICLE

Plućno krvarenje u novorođenčeta i mogućnosti prevencije

Pulmonary Haemorrhagie in Newborn and Ways of Prevention

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Sažetak Plućno krvarenje predstavlja teško akutno pogoršanje koje ima visoku stopu neonatalnog mortaliteta i morbiditeta. Nekoliko faktora rizika koji dovode do plućnog krvarenja je identifikovano ali tačna patogeneza nije poznata. Značajnu ulogu u nastanku plućnog krvarenja u neonatologiji ima razvoj plućnog edema koji obično nastaje usled povećanog plućnog protoka. Hemodinamski značajni duktus arteriozus, prematuritet, intrauterusni zastoj rasta i primena plućnog surfaktanta značajno doprinose povećanoj incidenci plućnog krvarenja. Specifična terapija ne postoji. U ovom članku posebna pažnja je posvećena identifikaciji faktora rizika i aktuelnim stavovima o tretmanu kao mogućnostima za prevenciju plućnog krvarenja kod novorođenčeta.

Ključne reči: plućno krvarenje , novorođenče, faktori rizika , prevencija

Summary Pulmonary hemorrhage is an acute deterioration that has a high rate of neonatal mortality and morbidity. Several risk factors that lead to pulmonary hemorrhage have been identified but the exact pathogenesis is not known. Important role in the development of pulmonary hemorrhage in neonatology is the development of pulmonary edema, which usually occurs due to increased pulmonary flow. Hemodynamically significant ductus arteriosus, prematurity, intrauterine growth and application of pulmonary surfactant significantly contribute to the increased incidence of pulmonary hemorrhage. There is no specific therapy. In this article, special attention was dedicated to the identification of risk factors and pulmonary hemorrhage treatments as a ways for its prevention

Keywords:pulmonary hemorrhage, newborn, risk factors, prevention

Uvod

Plućno krvarenje (PK) predstavlja teško akutno pogoršanje koje karakteriše prisustvo sveže krvi u gornjim respiratornim putevima ili tubusu ako je beba intubirana. Predstavlja vid fulminantnog plućnog edema sa pojavom eritrocita i kapilarnog filtrata u plućima. Plućna hemoragija je po pravilu praćena ozbiljnim poremećajem vitalnih funkcija i mora se jasno razdvojiti od pojave male količine hemoragičnog sadržaja koji je posledica traume nakon otežane intubacije ili agresivne aspiracije. Hematokrit tečnosti koja se nalazi u disajnim putevima je obično 15 do 20 procenata niži u odnosu na venski hematokrit dok je koncentracija proteina ove tečnosti veća u odnosu na koncentraciju proteina u plazmi. Prema svojim osnovim hematološkim i biohemijskim karakterisitikama tečnost koja se nalazi u tubusu najviše odgovara kapilarnom filtratu.

Incidenca

Plućno krvarenje se obično javlja u prvoj nedelji života kod beba lakših od 1500 gr koje imaju perzistentni duktus arteriozus (DAP), dobile su dobile su surfaktant i nalaze se na nekoj vrsti respiratorne potpore.

Incidenca iznosi 1-12 na 1000 živorođene dece. Među rizičnom populacijom (pramaturitet ili intrauterusni zastoj rasta) ova stopa raste do 50 slučajeva na 1000 živorođene (1). Mortalitet je izuzetno visok i iznosi i do 50%.

Etiologija

Faktori rizika za nastanak PK su oni koji koji se odnose na terminsku i preterminsku novorođenčad.

Kod terminske novorođenčadi plućna hemoragija se javlja u slučajevima mekonijumske aspiracije, sistemske hipotenzije i kod beba kod kojih se potreba za ventilacijom javlja već u porođajnoj sali.

Kod preterminske dece faktori rizika podrazumevaju intrauterusni zastoj rasta, primenu surfaktanta, duktus arteriouzus sa značajnim levo-desnim šantom. Takođe, asfiksija i hipoksija su dodatni faktori rizika, a pojava sepse koja se dalje može komplikovati razvojem diseminovane vaskularne koagulopatije dovodi pacijenta u ozbiljan rizik za razvoj PH. Napokon, muški pol i višeplodna trudnoća su dodatni faktori rizika.

Patogeneza

Tačna patogeneza plućne hemoragije nije poznata i do sada je prezentovano više teorija. Prvi značajniji rad na ovu temu je objavljen 1973 godine (2). Prema autorima ove studije smatralo se da je direktni razlog nastanka PK razvoj plućnog edema usled slabosti leve komore što bi bila posledica asfiksije. Dosta kasnije West je akcenat stavio na stres oštećenje kapilara koje dovodi do cepanja endotelne barijere usled čega dolazi do curenja hemoragijske tečnosti u alveole (3). Najverovatnije objašnjenje je da PK nastaje akumulacijom kapilarnog filtrata u plućnom intersticijumu, koji, kako ovo stanje napreduje, preplavljuje vazdušne puteve kroz alveolarni epitel. Postoji jasna asocijacija između PK i značajnog levo-desnog smera šanta koji dovodi do povišenog protoka kroz plućno vaskularno korito (4).

Dakle, PK u neonatusa predstavlja završni oblik plućnog edema. Plućni edem predstavlja akumulaciju ekstravaskularne tečnosti u intersticijumu pluća. Uzroci plućnog edema su predstavljeni na tebeli 1. Na tabeli su prikazane četiri grupe poremećaja koje dovode do nastanka plućnog edema u čijoj osnovi stoji poremećaj Starlingove jednačine. U fiziološkim uslovima, tečnost prelazi iz kapilara u intersticijum, a potom se preko limfnih sudova drenira u sistemsku cikrulaciju. Količinu filtrata određuje kapilarni hidrostatski pritisak umanjen za osmotski pritisak koji vlada duž kapilarnog zida. Povećanje neto razlike između filtracionih (hidrostatičkih) pritiska i onkotskih pritisaka potencira intersticijalni influks kao i povećana permeabilnost vaskularnog zida. Svaki od navedenih uzročnika u tabeli 1 dovodi do poremećaja u odnosima koji čine Starlingovu jednačinu i koji regulišu neto količinu protoka čime dovode do razvoja plućnog edema što predstavlja uvod u plućnu hemoragiju.

Tabela 1. Uzroci plućnog edema
Table 1. Causes of pulmonary oedema

1. Povećan plućni mikrovaskularni pritisak	**2. Redukovan intravaskularni onkotski pritisak**	**3. Redukovana limfatična drenaža**	**4. Povećana mikrovaskularna permeabilnost**
Srčani zastoj	Prematuritet	Plućni intesticijalni emfizem	Sepsa
Hipoksija	Hidrops	Plućna fibroza	Endotoksemija
Transfuzije	Hiperhidracija	Povećan centralni venski pritisak	Embolija
Intravenozna primena lipida (TPI)	Hipoproteinemija		Oksidativni stres
Povećan plućni protok			
Plućna hiperplazija			

Uzroci plućnog edema (5):

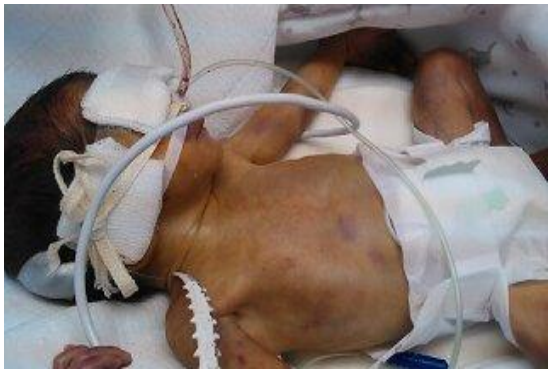
U grupi uzročnika plućnog edema usled povećanja mikrovaskularnog pritiska posebno se izdvaja hemodinamski značajan duktus kada dolazi do povećanog protoka kroz plućne kapilare što dovodi do povećanja hidrostatičkog odnosno mikrovaskularnog pritiska i dovodi do povećane količine filtrata koji prodire u intersticijum i dovodi do nastanka plućnog edema. Primena velike količine derivata krvi, koloida ili elektrolita mogu dodatno da povećaju volumen krvi koji prolazi kroz pluća i da na taj način dodatno pogoršava kliničku sliku plućnog edema i uzrokuje (PK).

Perzistentni arterijski duktus (DAP) predstavlja veliku vaskularnu formaciju koja povezuje plućnu arteriju sa descendentnom aortom i kojom krv, zahvaljujući visokom plućnom vaskularnom protoku zaobilazi pluća tokom fetalnog života. Nakon rođenja dolazi do postepenog zatvaranja DAP-a na koji, pored ostalog utiče porast arterijskog parcijalnog pritiska kiseonika što dovodi do snažne vazokonstrikcije. Kompletno zatvaranje se odvija u dve faze. Prva je funkcionalna kada nastaje konstrikcija muskularnog sloja duktusa čime prestaje protok krvi. U drugoj fazi nastje strukturno zatvaranje kada dolazi do ishemije i nekroze intime (6). Tokom faze funkcionalnog zatvaranja moguće je ponovno otvaranje DAP-a spontano ili npr. usled sepse. Na zatvaranje utiču nezrelost, mehanička ventilacija, respiratorni distres sindrom. Dijagnostika DAP-a je složena. Prva dva postnatalna dana DAP je klinički nem. Klasični znaci DAP-a (šum, puni pulsevi i aktivni prekordijum) imaju malu senzitivnost u odnosu na ultrazvučni pregled srca. Tek šestog i sedmog dana dolazi do poklapanja kliničkog i ultrazvučnog nalaza što praktično znači da krv šantuje dva dana pre nego što DAP postane klinički prepoznatljiv. Hemodinamski značajan je DAP koji ima više od 1,5 mm u prečniku kod dece ispod 1500 grama sa ili bez retrogradnog protoka u descendentnoj aorti (7). Smer šanta DAP-a zavisi od plućne vaskularne rezistencije. Obično se misli da je DA balansiran ili levo-desni ali u stvari u većini slučajeva pritisak u plućnoj arteriji je manji od sistemskog i šant je levo-desni. Kod hemodimamski značajnog DAP-a, značajan volumen krvi prelazi iz sistemske u plućnu cirkulaciju. Na taj način sistemski protok slabi i postaje insuficijentan šta dalje produbljuje hipoksiju vitalnih organa i utiče na povećanje neonatalnog morbiditeta. Dakle krv recirkuliše kroz pluća tako da protok krvi kroz pluća može biti i dva do tri puta veći od sistemskog (8, 9). U plućnim kapilarima vlada nizak otpor i plućni kapilari nisu stvoreni za tako visoke protoke. Fetalni plućni protok iznosi od 10 do 20 ml/kg/min., a kod hemodinamski značajnih duktusa plućni protok može biti veći od 500 ml/kg/min(10)! Primena plućnog surfaktanta dovodi do daljeg smanjenja PVR-a i do povećanog protoka krvi kroz plućne kapilare što pogoršava respiratorni status i uvodi pacijenta u plućni edem koji je faktor rizika za nastanak PK (11,12).

Tokom septičnog šoka i endotoksemije dolazi do povećanje sinteze proinflamatornih citokina, pre svega interleukina 1, 6, 8, 10 i tumor nekrozis faktora koji povećavaju vaskularnu permeabilnost, stvaraju hipotenziju i šok što predstavlja uvod u plućni edeme i razvoj plućne hemoragije.

Klinička slika

PK obično nastaje između drugog i četvrtog postnatalnog dana. To je dramatično i iznenadno kliničko pogoršanje koje nastaje sa pojavom crvenog i penušavog sekreta u tubusu ili ustima. Novorođenče je blede ili ikterične boje kože, u generalizovanoj hipotoniji, cijanotično, bradikardično, agonalnih respiratonih pokreta ili pak apnoično, septičnog aspekta, ne reaguje (Slike 1,2).



Slika 1

.***Slika 2.***

Slika 1&2. Plućna hemoragija kod prevremeno rođenog deteta na respiratornoj potpori sa tragovima sveže krvi u tubusu.

Figure 1& 2. Pulmonary haemorrhage in premature baby on respiratory support and traces of fresh blood in endotracheal tube

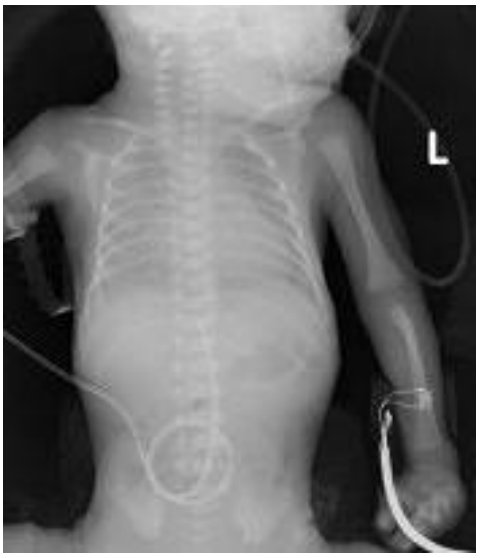
Terminske bebe mogu biti aktivne i iritabilne usled hipoksije i neusklađene sa respiratorom. Usled srčane insfucijencije može se javiti tahikardija i šum DAP-a. Drugi znaci kardiovaskularnog kolapsa uključuju hepatosplenomegaliju, periferne odnosno generalizovane edeme dok se na plućima čuju pukoti sa difuznom oslabljenim disajnim zvukom usled smanjene aeracije pluća.

Kod pacijenata sa PK preduzimamo brojna laboratorijske i druga ispitivanja.

Hematološka ispitivanja: iako je hematokrit filtrata oko 10% značajne količine krvi mogu biti izgubljene naročito kod pacijenata ekstremno male telesne mase. U toku prva 24 sata razvija se ozbiljna anemija koja zahteva anemiju. Takođe, moguć je sekundarni razvoj DIK-a.

Nakon hematoloških potrebno je uraditi i biohemijske analize. Obično se kod novorođenčadi sa PH nalazi hipoglikemija, hipokalcemija i hipoalbuminemija, a usled razvoja hipvolemijskog šoka i DIK-a, moguće su komplikacije u vidu akutne bubrežne insuficijencije kada je svakako potrebno proširiti spektar traženih analiza.

Radiografski snimak pluća u slučaju PH je obavezan. Masivna plućna hemoragija se na rendgenskom snimku najčešće prikazuje u vidu potpuno belih pluća sa jedva primetnim bronhogramom ili se vide mrljasta zasenčenja i zone neadekvatne transparencije (Slika 3).



Slika 3. Rendgenski snimak nakon plućne hemoragije i aspiracije kod prevremeno rođene bebe koja je intubirana i sa plasiranim venskim umbilikalnim katerom.

Figure 3.Chesy X ray in pulmonary haemorrhage after the aspiration in intubated premature baby and umbilical catheter on place

Kako se stanje popravlja, promene se mogu izgubiti ili mogu, nakon nekog vremena izgledati kao promene koje daje BPD. Retko, viđa se lobarna konsolidacija u slučaju da PH nije obimna. U svakom slučaju, radiografski snimak prikazuje ozbiljan poremećaj odnosa ventilacije/perfuzije. Sve komponente gasnih analiza ukazuju pogoršanje gasne razmene. U gasnim analizama nalazimo hipoksiju, hiperkapniju, a kako stanje perzistira dolazi do razvoja metaboličke acidoze.

Skrining za sepsu je obavezan i obuhvata kompletnu bakteriološku obradu kao i izmenu antibiotske terapije.

Terapija

Primena mera kardiopulmonalne reanimacije je prioritet. Pacijent koji nije intubiran se mora intubirati. Potrebno je osloboditi disajne puteve što se obavlja sukcijom, kako bi se obezbedila odogvarajuća gasna razmena i kako se beba ne bi ugušila. Prilikom sukcije savetuje se korišćenje zatvorenog sistema, a nakon

stabilizacije, broj sukcija i njihovo trajanje je potrebno redukovati. Naročito je potrebno izbegavati duboku sukciju, tj. onu koja podrazumeva inserciju katetera do bifurkacije traheje jer takva sukcija može da dovede do traumatizacije pluća i do komplikacija u vidu pneumtoraksa ili do perforacije bronha. Savetuje se, pored navedenog, da se sukcija obavlja do unapred određene visine (visina tubusa+visina adaptera).

Nakon intubacije i oslobađanja disajnih puteva koriguju se parametri mehaničke ventilacije što podrazumeva veći inspiratorni pritisak sa povećanjem inspiratornog vremena (0,4-0,5 s) uz veću koncentraciju inspiratorne frakcije kiseonika. Takođe, poveća se i pritisak na kraju ekspirijuma (PEEP) koji u slučaju PH treba da iznosi od 6 do 8 cm H_2O. Ove vrednosti PEEP-a obezbeđuju stabilizaciju alveola i tamponadu plućnih kapilara čime se sprečava krvarenje. Povećanjem navedenih parametara mehaničke ventilacije stvaramo, s druge strane uslove za nastanak hiperinflacije i barotraume što predtsvalja uvod u razvoj BPD-a.

Sledeća terapijska mera obuhvata korekciju volumena i hipotenzije. Preporučuje se bolus kristaloida od 10-15 ml/kg za 30 minuta, primena sveže smrznute plazme. Po korekciji volumena, a u clju održanja krvnog pritiska i kontraktilnosti miokarda potrebno je obezbediti inotropnu potporu.

U slučaju produbljivanja respiratorne insuficijencije i kada je potrebno dalje povećanje srednjeg pritiska u disajnim putevima (MAP), opravdana je primena visoko-frekventne oscilatorne respiratorne potpore (HFOV). Ona dovodi do smanjenja inspiratorne frakcije kiseonika i do povećanje stope preživljavanja (13).

Za primenu adrenalina ne postoje usaglašeni stavovi iako se, u pojedenim slučajevima PK očekuje pozitivno vazokonstriktorno i inotropno dejstvo adrenalina. Takođe, postoje nedoumice u kom obliku ga primeniti: endotrahealni ili nebulizovani, razblaženi ili nerazblaženi oblik.

Paradoksalno, dok je primena plućnog surfaktanta povezana sa povećanom incidencom PK, upravo se plućni surfaktant primenjuje za lečenje. Hemoglobin, eritrociti i proteini krvi prilikom PK inaktiviraju surfaktant u plućima čime dolazi do sekundarne insuficijencije surfaktanta i razvoja respiratornog distresa. Primenom surfaktanta smanjuje se plućna komplijansa, dolazi do poboljšanja oksigenacije i stabilizacije kliničke slike (14).

Vitamin K (fitonadion) se daje radi korekcije protrombinemije.

Kao krajnja terapijska mera, kod ozbiljnih i upornih krvarenja koja su refraktorna na konvencionalnu terapiju može se primeniti aktivisani rekombinatni faktor VIIa (rFVIIa) koji se inače koristi kod pacijenata koji boluju od hemofilije A ili B sa razvijenim antitelima. U pitanju je panhemostatički agens koji aktivira spoljni put koagulacije vezivanjem za tkivni faktor i formiranjem hemostatičkog čepa na mestu vaskularne lezije, i posredno, vezivanjem za površinu trombocita i aktiviranjem sinteze trombina. Doza je 50 μg/kg dva puta dnevno u razmaku ne manjem od tri sata, naredna dva do tri dana. Prednost, pored ostalog je u primeni manjeg volumena u odnosu na prethodnu terapiju jer je ekscesivan volumen kod pacijenata sa PH kontraproduktivan tako da volumen rFVIIa prema navedenom protokolu iznosi svega 4 ml za 3 dana terapije (15, 16).

Prevalencija

Multifaktorijalna etiologija kao i složena patogeneza čine plućno krvarenje nepredvidim akutnim pogoršanjem u čijoj je osnovi hemodinamski značajan duktus arteriozus i levo-desni šant koji dovodi do povećanog protoka kroz plućne kapilare te se mere prevencije i terapije zasnivaju na postupcima identifikacije i predikcije ovih složenih mehanizama. U tom smislu su se izdvojila tri načina tretiranja duktusa arteriozusa. Najmanje agresivan pristup je terapijski tretman duktusa samo kada je on klinički prisutan, a najagresivniji je primena medikamentoznog zatvaranja kod svih rizičnih beba. U slučaju primene najmanje agresivne metode oko jedne trećine beba rođenih pre 30 nedelje gestacije će biti tretirano. Ovo je najšire prihvaćena metoda iako nema dovoljno dokaza da ona poboljšava ishod. Naredni, presimptomatski pristup podrazumeva korišćenje dijagnostičkih metoda, pre svega ultrazvuka, koji uz kliničku sliku treba da detektuje duktus i tretira ga medikamentozno pre ispoljavanja pune simptomatologije i to najčešće nakon prvog, a pre petog dana života. I na kraju, profilaktički pristup tretira svu rizičnu populaciju pacijenata i to prvog dana, obično tokom prvih šest sati života. Uprkos dokazima koji ukazuju da ova, profilaktička primena indometacina dovodi do redukcije intraventrikularne hemoragije i siptomatskog DAP-a kao i smanjene potrebe za hiruškom ligaturom, ovaj pristup nije opšteprihvaćen najviše zbog zabrinutosti da indometacin utiče na redukovanje moždanog krvotoka (16).

Prema svemu navedenom identifikacija pacijenata i primena medikamentoznog zatvaranja duktusa arteriozusa zahteva multidisciplinaran pristup, intenzivno ultrazvučno praćenje i kontinuiranu procenu kliničkog statusa. Dakle, znamo da duktus arteriozus mora biti zatvoren ali odluka o tome da li će se proces zatvaranja obaviti spontanim putem, prirodno ili pak, arteficijalno, donosi se konzilijarno i umnogome zavisi od protokola koji se primenjuju na odeljenju intenzivne nege i stanja neonatusa u datom trenutku.

Zaključak

PH predstavlja teško i akutno pogoršanje koja naročito pogađa prevremno rođenu decu male i ekstremno male telesne mase na odeljenjima intenzivne nege. Mogućnost neuroloških ispada i smrtnog ishoda je dva puta veća u odnosu na populaciju koja PK nije imala. Povećan je i rizik za nastanak konvulzija i PVL-a, a 60% novorođenčadi koja prežive PH će razviti BPD (17).

Literatura:

1. Berger TM, Allred EN, Van Marter LJ. Antecedents of clinically significant pulmonary hemorrhage among newborn infants. J Perinatology. 2000;20(5):295-300
2. Cole VA, Normand IC, Reynolds EO, Rivers RP. Pathogenesis of hemorrhagic pulmonary edema and massive pulmonary hemorrhage in the newborn. Paediatrics. 1973;
3. Evans N, Kluckow M. High pulmonary blood flow and pulmonary hemorrhage. Pediatr Res 1999; 45: 195a.
4. Greenough A, Milner AD. Pulmonary haemorrhage. In: Rennie JM, ed. Roberton's textbook of neonatology, 4th edn. Edinburgh: Churchill Livingstone, 2005, p. 512–5.
5. Clyman RI, Chan CY, Mauray F, Chen YQ, Cox W, Seidner SR, Lord EM, Weiss H, Waleh N, Evans SM, Koch CJ. Permanent anatomic closure of the ductus arteriosus in newborn baboons: the roles of postnatal constriction, hypoxia, and gestation. Pediatr Res. 1999 Jan; 45(1):19-29.
6. Nick Evans. Patent ductus arteriosus in the neonate. Current Paediatrics (2005) 15, 381-389.
7. Evans N, Iyer P. Incompetance of the foramen ovale in preterm infant requring ventilation. J Pediatr 1994; 125:786-92.
8. Evans N, Iyer P. Assesment of ductus aretriousus shunting in preterm infants requiring ventilation: effect of iner-atrial shunting. J Pediatr 1994; 125:778-785.
9. Evans N., Kluckow M. Ductal shunting, high pulmonary blood floow, and pulmonary hemorrhage. J Pediatr 2000; 137:68-72.
10. Raju TN, Langenberg P. Pulmonary hemorrhage and exogenous surfactant therapy: a meta-analysis. J Pedatr 1993; 123:603-610.
11. Kaapa P, Seppanen M, Kero P, Saraste M. Pulmonary hemodynamics after synthetic surfactant replacment in neonatal respiratory distress syndrome. J Pediatr 1993; 123:115-9.
12. AlKharfy TM. High-Frequency Ventilation in the Management of Very-Low-Birth-Weight Infants with Pulmonary Hemorrhage AmJPerinatol. 2004; 21(1):19-26
13. Pandit PB, Dunn MS, Colucci EA. Surfactant therapy in neonates with respiratory deterioration due to pulmonary hemorrhage. Paediatrics. 1995;95(1):32-36.
14. Olomu N, Kulkarni R, Manco - Johnson M, Treatment of Severe Pulmonary Hemorrhage With Activated Recombinant Factor VII (rFVIIa) in Very Low Birth Weight Infant. J perinatology. 2002;22(8):672-674.
15. Cetin H, Yalaz M, Akisu M, Karapinar DY, Kvakli K, Kultursay N. The use of recombinant activated factor VII in the treatment of massive pulmonary hemorrhage in a preterm infant. Blood Coagul Fibrinolysis. 2006;17(3):213-216.
16. Prof Nick Evans. Practical Guideline to PDA Treatment at RPA Hospital. 2013;Tomaszewska M, Stork E, Minich NM, Friedman H, Berlin S, Hack. Pulmonary hemorrhage: clinical course and outcomes among very low-birth-weight infants. Arch Pediatr Adolesc Med. 1999; 153(7):715-721.

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PREGLED LITERATURE – REVIEW ARTICLE

Preventing the Most Common Anesthesia Related Complications in Children

Prevencija najčešćih komplikacija vezanih za izvođenje anestezije kod dece

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Summary Over the last decades change in the profile of common complications in paediatric anesthesia was noticed. The differences between children and adults are distinguished especially in three areas: the high complication rate among neonates, the importance of respiratory disorders in younger children, and the high frequency of postoperative nausea and vomiting in older children. Many pitfalls and problems can be avoided by early recognition, quick intervention and strict attention to details of management

Keywords*:* prevention; complications; anesthesia; child

Sažetak Tokom poslednjih decenija uočena je promena u zastupljenosti najčešćih komplikacija u dečijoj anesteziji. Osnovne razlike između dece i odraslih mogu se grupisati u tri pojavna oblika: najveća učestalost komplikacija prisutna je kod novorođenčadi, respiratorne komplikacije karakteristične su za decu mlađeg uzrasta a najveća frekvenca postoperativne mučnine i povraćanja uočena je kod starije dece. Brojni izazovi i problemi mogu se izbeći ranim prepoznavanjem i brzom svrsishodnom intervencijom.

Ključne reči:prevencija; komplikacije; anestezija; dete

Introduction

One of the most frequent questions parents ask of a paediatric anesthesiologist is "What are the risks of anesthesia for my child (1)?"

In most circumstances, there is no noticeable change in the paediatric patient a few days following minor surgery and anesthesia; however, experience shows us this outcome cannot be guaranteed. The wise anesthesiologist acknowledges this preoperatively, although many parents may not choose to discuss their fears and the risks of anesthesia on the day of surgery. Large, retrospective, and prospective studies document a low incidence of morbidity and even less mortality in healthy children undergoing anesthesia for elective surgery. It is commonly said that the chance of injury during anesthesia is less than that during the car ride to the hospital. But unanticipated bad things have happened.

The possible complications in paediatric anaesthesia are many and one usually distinguishes:

- mortality
- major morbidity, e.g., permanent neurological damage following hypoxaemia or hyponatraemia, subglottic stenosis following intubation, more rarely limb deformities following vascular access
- "minor morbidity": with no sequelae (e.g., postoperative nausea and vomiting) or of supposed short-term duration (e.g., behavioural changes).

Progress in pharmacology, equipment and education has lead to a dramatic decrease in mortality and major morbidity caused by anaesthesia. This has increased interest in the prevention of minor sequelae but has also raised new questions regarding the effects of anaesthesia on immunity, neuronal apoptosis etc.

Minor events, significant injuries, and deaths related to the administration of anesthesia are more common in younger, sicker paediatric patients, and notably in emergency surgeries (2, 3).

Respiratory complications

Perioperative respiratory adverse events (PRAEs) are a major risk for perioperative morbidity and cause 30% of perioperative cardiac arrests in children. Typical adverse events in children with respiratory tract infection are laryngospasm, bronchospasm, breath holding, atelectasis, arterial oxygen desaturation, bacterial pneumonia, and unplanned hospital admission. Upper respiratory tract infections (URIs) are very frequent in childhood, and the

mean annual incidence of respiratory illnesses per child is higher in younger children: infants and preschool children have 6–8 colds a year.

Children presenting with signs of a serious infection, bacterial superinfection, or impairment of the lower respiratory tract are at an increased risk for adverse events; signs of serious or systemic infection include fever above 38.5°C, dyspnea, wheezing, purulent secretion and cough, pneumonia and otitis media. The parents have important influence, as passive smoking is a predictor of adverse events as well as the parents' belief that 'their child has a cold (4).

The incidence of respiratory events during anesthesia is also higher in younger children. This effect may be due to the relatively narrow infant airway and the higher incidence of respiratory tract infections in young children. The findings of increased risk for children who are younger than 1 year of age (especially children younger than 1 month) indicate the need for greater caution when caring for children who are under 1 year of age (5). Prematurity, congenital heart disease and other congenital defects place neonates and infants at higher anaesthesia risk than older children and adults.

Viral invasion of the respiratory epithelium and mucosa during a 'cold' can lead to persistent bronchial hyperreactivity and bronchoconstriction for up to 6 weeks, which is similar to the pathophysiology of asthma bronchiale. However, there is a consensus that it is no longer mandatory to postpone surgery for a period of 6 weeks. Several authors have proposed a delay of at least 2 weeks when acute clinical signs of an infection are observed (6, 7).

It has been shown that any manipulation of the upper airway of the child results in a significant increase of the risk of PRAE. Such manipulation can include the instrumental manipulation of the airway itself, for example, with bronchoscopy, or invasive airway management, for example, endotracheal intubation. Surgery near the airway, such as ENT surgery or eye surgery, and surgery with impairment of respiratory function, such as upper abdominal surgery or cardiac surgery, are also associated with increased risk (4).

Salbutamol pretreatment should be considered in all children presenting with a URI or a moist cough. Hamilton et al. (8) investigated more than 1000 children for elective general anesthesia with endotracheal intubation and found a significantly higher rate of desaturation in children treated with topical lidocaine compared with the placebo group. In this study, no difference in the incidence of laryngospasm was found. There is still a lack of evidence for the preventive effects of intravenous lidocaine on the incidence of PRAEs. Sanikop and Bhat (9) showed that 1.5 mg/kg lidocaine given 2 min before extubation resulted in a decrease in postextubational laryngospasm and coughing with statistical significance and clinical relevance.

Intravenous induction with propofol itself can be described as a safety margin because the intravenous line is already established and thus not necessary to implement during the critical interval of anesthesia induction; if complications occur, they can be treated without any loss of time. Furthermore, propofol was shown to have bronchodilating effects similar to those of volatile anesthetics. In a study comparing propofol and sevoflurane for procedural sedation for MRI, apnea with laryngospasm occurred more often during anesthesia with sevoflurane compared with propofol. However, the incidence of coughing and breath-holding was higher in the propofol group (10). von Ungern-Sternberg et al. (11) suggest that 'intravenous anesthesia with propofol might be associated with lower incidence of PRAE with a better preventive effect when used as a maintenance drug compared to sevoflurane', and Lerman (12) comments on the findings that 'one should anticipate a reduced frequency of PRAEs after intravenous induction of anesthesia than after inhalational induction, even when a minimally noxious agent such as sevoflurane is used'. Desflurane should be strictly avoided because of its bronchoconstrictory characteristics. The use of nitrous oxide in patients with pulmonary infections should be avoided, as it can lead to diffusion hypoxia and atelectasis. Atracurium may also cause bronchospasm and laryngospasm.

There is controversy in the literature regarding the use of the airway device and associated risk of laryngospasm. The endotracheal tube (ETT) was shown to be associated with increased incidence of laryngospasm. The use of facemask in URI was suggested to be associated with low incidence of laryngospasm. However, in three recent prospective studies, there was no statistical difference of the incidence of laryngospasm among facemask, LMA and ETT. This may have been attributed to beta error, too small a sample size for a rare occurrence. On the contrary, in two retrospective studies, LMA was shown to increase the incidence of laryngospasm. However, data collection accuracy and LMA's appropriate use in these studies have been questioned. It is suggested that the use of cuffed tracheal tubes in younger than 4-year-old children may predispose to laryngotracheal injury and laryngospasm (13). Recruitment maneuver for extubation of the trachea should be used, and trachea should be extubated either in deep anesthesia or after complete emergence.

When laryngospasm occurs, it is treatable with airway-opening maneuvers, deepening of sedation, application of continuous positive airway pressure and muscle relaxation. Laryngospasm is more frequent in children with an URI who had their anesthesia supervised by a less experienced anesthesiologist.

Bronchospasm during anesthesia is characterized by an expiratory wheezing, prolonged expiration, and/or increased pressure during intermittent positive pressure ventilation (IPPV) or decreased tidal volumes during pressure controlled ventilation (PCV). It is usually triggered by airway irritation, especially in patients with a pre-existing airway disease. To prevent serious desaturation during the bronchospasm, a rapid recognition and treatment of the problem is important and includes ceasing the stimulation,

deepening the anesthesia, and administering bronchodilators, adrenaline or salbutamol.

The relationship between preoperative fasting and risk of pulmonary aspiration of gastric contents is an area of constant interest. In assessing the risk of pulmonary aspiration, gastric volume is used as a surrogate to guide perioperative fasting. The practice of anesthesia has changed dramatically in recommendations for preoperative fasting.Based on the evidence from the meta-analysis and the agreement of the consultants and ASA members, clear liquids are appropriate up to 2h before elective procedures requiring general anesthesia, regional anesthesia, or monitored anesthesia care. The literature is insufficient but the consultants agree that fasting from breast milk should be maintained for 4 h. Fasting from formula, nonhuman milk, and light meal should be for 6 h, and fasting from fatty meal should be at least 8h. Guidelines from the European Society of Anaesthesiologists also have the same recommendations. This evidence applies only to children who are considered to be at normal risk of aspiration/regurgitation during anesthesia (14). The study results of Schmitz et al. stress the need for smooth induction even in patients who followed the recommended guidelines (15).

Cardiovascular complications

Intravascular fluid loss and current volume status are often underestimated in paediatric patients, especially in newborns and infants. Due to their smaller blood volume, paediatric patients are more sensitive to excessive as well as inadequate hydration. In children, heart rate may be a more sensitive guide to intravascular fluid status than blood pressure. By the time hypotension becomes apparent, severe hypovolemia is often already present, and cardiovascular collapse may soon ensue without appropriate volume resuscitation. Securing adequate intravascular access prior to surgery is a must for surgeries in which significant blood loss is expected. Failure to do so and failure to keep up with intraoperative blood loss are the most common reasons why cardiac arrests from hypovolemia are deemed to be anaesthesia- related (16).

Difficulty of intravenous cannulation is sometimes encountered especially in the preterm neonates, overweight babies and when most peripheral veins had been ruined from withdrawal of blood sample for laboratory investigations and intravenous therapy.

Large-volume or exchange transfusions in neonates and small children can result in life-threatening hyperkalemia and cardiac arrest. This is potentially preventable. Serum potassium levels can rise quickly during blood transfusions in children with a small blood volume. Blood components with the highest levels of potassium include whole blood, irradiated blood and units approaching their expiration date. To reduce the risk of transfusion-related hyperkalemia in neonates and infants, washed or fresh (i.e. less than 7 days old) packed red blood cells should be used. Packed red cells have a lower potassium load than whole blood because of the reduced amount of plasma. Life-threatening hyperkalemia can still occur with packed red blood cells if large volumes are rapidly transfused.

The most common equipment problems are complications of anaesthesiologist-placed central lines, either from induction of an arrhythmia or from creation of tamponade, hemothorax or pneumothorax (16).

Poor ASA physical status (≥III) and emergency surgery have been reported as risk factors for paediatric perioperative mortality and are the only predictive factors of mortality after cardiac arrest. Morita et al. (17) found that most incidents of perioperative cardiac arrest and death in neonates can be attributed to underlying comorbidities rather than causes related to the anesthesia. Children with heart disease exhibit higher rates of perioperative cardiac arrest and mortality when undergoing cardiac or noncardiac surgery.

Nausea and vomiting

Postoperative nausea and vomiting (PONV) is considered as one of the “big little problems” after general anesthesia. The incidence of this distressing problem can be reduced by using a total IV anesthetic (TIVA) technique instead of inhaled anesthetics and by administering antiemetics prophylactically. However, routine efforts to prevent PONV are not indicated because of the potential for adverse effects, the perception that there are increased costs, and the lack of evidence that patient satisfaction is affected.

There is good evidence from clinical trials that toddlers are less susceptible to emetic stimuli than school children and adolescents. As nausea is difficult to identify in infants and small children, studies of PONV in this patient population are usually limited to the onset of postoperative vomiting (POV). Around the age of three years, the risk to develop PV increases dramatically.

Most surgery does not have an influence on PV, even though this might have been expected by theoretical pathophysiological considerations (e.g., middle ear surgery is often considered to be a risk surgery). However, strabismus surgery is an independent risk factor for PV.

The longer an emetic stimulus (e.g., administration of volatile anesthetics and opioids) is present, the more likely it is that this trigger leads to nausea and vomiting. The positive history of PONV is an unequivocally accepted risk factor for further PONV symptoms at future anesthesia. Thus, it was not surprising to notice that this was also the case in children. More interesting is that children with parents or siblings who have experienced PV or PONV after a previous anesthesia are at increased risk. The question is whether this family association with PV/PONV is genetically or behaviorally determined. There is some evidence in the literature that genetic aspects might be involved (18).

The mechanism for the potential antiemetic effect of performing locoregional anesthesia in children remains speculative. When performed intraoperatively, a locoregional block reduced the need for opioids and also for

large doses of volatile anesthetics that were shown to be a main cause for PV during the early stage of recovery.
It is not surprising that the administration of postoperative opioids had a tendency to increase PV, because opioids are known to cause PONV.

Murat et al. study(19) gave very interesting finding that the incidence of adverse events during anaesthesia was similar in patients operated as an emergency compared with nonemergency surgery, but vomiting was less frequently reported in patients operated as an emergency compared with nonemergency surgery.
High-risk patients must be given multimodal prophylaxis, involving both the avoidance of known risk factors and the application of multiple validated and effective antiemetic interventions (20).

Conclusion

Despite an overall improvement in mortality and morbidity rates for anaesthetized children over the past 50 years, the long-recognized fact that anaesthesia related complications occur more frequently in the paediatric population still holds true. Infants are at greatest risk of complications and they suffer predominantly respiratory complications.

References

1. Cohen MM, Cameron CB, Duncan PG.Paediatric anesthesia morbidity and mortality in the perioperative period. Anesth Analg. 1990; 70:16-7.
2. Bharti N, Batra YK, Kaur H. Paediatric perioperative cardiac arrest and its mortality: database of a 60-month period from a tertiary care paediatric centre. Eur J Anaesthesiol. 2009; 26(6):490-495.
3. Brandom BW, Callahan P, Micalizzi DA. What happens when things go wrong? Paediatr Anaesth. 2011; 21(7):730-736.
4. Becke K. Anesthesia in children with a cold. Curr Opin Anaesthesiol. 2012; 25(3):333-339.
5. Gonzalez LP, Pignaton W, Kusano PS, Módolo NS, Braz JR et al. Anesthesia-related mortality in paediatric patients: a systematic review. Clinics (Sao Paulo) 2012; 67(4):381-7.
6. von Ungern-Sternberg BS, Boda K, Schwab C, et al. Laryngeal mask airway is associated with an increased incidence of adverse respiratory events in children with recent upper respiratory tract infections. Anesthesiology 2007; 107:714–719.
7. Rachel Homer J, Elwood T, Peterson D, et al. Risk factors for adverse events in children with colds emerging from anesthesia: a logistic regression. Paediatr Anaesth 2007; 17:154–16.
8. Hamilton ND, Hegarty M, Calder A, Erb TO, von Ungern-Sternberg BS. Does topical lidocaine before tracheal intubation attenuate airway responses in children? An observational audit. Paediatr Anaesth. 2012; 22(4):345-50.
9. Sanikop CS, Bhat S. Efficacy of intravenous lidocaine in prevention of post extubation laryngospasm in children undergoing cleft palate surgeries. Indian J Anaesth 2010; 54:132–136.
10. Oberer C, Ungern-Sternberg BS, Frei FJ, et al. Respiratory reflex responses of the larynx differ between sevofluran and propofol in paediatric patients. Anesthesiology 2005; 103:1142–1148.
11. von Ungern-Sternberg, Boda K, Chambers NA, et al. Risk assessment for respiratory complications in paediatric anaesthesia: a prospective cohort study. Lancet 2010; 376:773–783.
12. Lerman J. Perioperative respiratory complications in children. Lancet 2010; 376:745–746.
13. Al-alami AA, Zestos MM, Baraka AS. Paediatric laryngospasm: prevention and treatment. Curr Opin Anaesthesiol. 2009; 22(3):388-395.
14. Hanna AH, Mason LJ. Challenges in paediatric ambulatory anesthesia. Curr Opin Anaesthesiol. 2012; 25(3):315-320.
15. Schmitz A, Kellenberger CJ, Neuhaus D, et al. Fasting times and gastric contents volume in children undergoing deep propofol sedation: an assessment using magnetic resonance imaging. Paediatr Anaesth 2011; 21:685–690.
16. Lee C, Mason L. Complications in paediatric anaesthesia. Curr Opin Anaesthesiol. 2006; 19(3):262-267.
17. Morita K, Kawashima Y, Irita K, Kobayayashi T, Goto Y, Iwao Y, et al.Perioperative mortality and morbidity in 1999 with a special reference to age in 466 certified training hospitals of Japanese Society of Anesthesiologists–report of Committee on Operating Room Safety of Japanese Society of Anesthesiologists. Masui. 2001; 50(8):909-921.
18. Eberhart LH, Geldner G, Kranke P, Morin AM, Schäuffelen A et al. The development and validation of a risk score to predict the probability of postoperative vomiting in paediatric patients. Anesth Analg. 2004; 99(6):1630-1637.
19. Murat I, Constant I, Maud'huy H. Perioperative anaesthetic morbidity in children: a database of 24,165 anaesthetics over a 30-month period. Paediatr Anaesth. 2004; 14(2):158-166.
20. Rüsch D, Eberhart LH, Wallenborn J, Kranke P. Nausea and vomiting after surgery under general anesthesia: an evidence-based review concerning risk assessment, prevention, and treatment. Dtsch Arztebl Int. 2010; 107(42):733-741.

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PREGLED LITERATURE – REVIEW ARTICLE

Cardiovascular risk prediction in children with focus on obesity

Rizik od kardiovaskularnih bolesti kod gojazne dece

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Summary The majority of children at risk for future cardiovascular disease who need specific and systematic cardiovascular risk assessments are obese children. However, there are still many unresolved questions related to pathophysiology, recognition and management of obese children. Currently, the most prevalent paradigm for identifying children at risk forcardiovascular events is based on the population approachand identification of the level and/or number of traditional risk factors. However risk assessment methods basedon, traditionalrisk factors solely have proven to be suboptimal and unreliable. Since early atherosclerosis commonly occurs in the absence of abnormal threshold levels of risk factors, the traditional risk factors based approach has recently shifted to "individual-based approach". Such a new concept is focused on the identification of asymptomatic structural target organ changes or more recently subclinical functional cardiac or vascular target organ changes to identify children at risk.

***Keywords**:* cardiovascular risk, children, obesity

Sažetak Većina dece sa rizikom za prevremeni nastanak kardiovaskularnih bolesti (KVS) jesu gojazna deca. Danas postoji još uvek puno kontraverzi vezano za patofiziologiju KVS bolesti u gojazne dece, njihovu pravovremenu dijagnostiku I način terapije. Trenutna doktrina u kliničkom pristupu gojaznoj deci se sastoji u identifikaciji broja I nivoa tradicionalnih faktora rizika. Ovakav pristup može biti prilično nepouzdan I zbog toga se sve više teži ranom prepoznavanju I kvantifikaciji subkliničkih organskih promena koje prethode KVS morbidnim događanjima. U radu će biti prikazane aktuelne dileme vezane za rizik stratifikaciju gojazne dece sa osvrtom na rizik predikciju KVS bolesti u odraslih.

Ključne reči: kardiovaskularni rizik, deca, gojaznost

Introduction

It is a general truth that correct prediction in everyday life appears to be more of the exception rather than the rule. This is especially obvious for future individual health prediction, particularly future cardiovascular risk (CV) prediction in obese individuals which often turns out to be wrong or widely inaccurate.

The majority of children at risk for future cardiovascular disease who need specific and systematic cardiovascular risk assessments are obese children with metabolic syndrome (MetS) (1,2,3). However, there are still many unresolved questions related to pathophysiology, recognition and management of obese children. The remoteness of incident CVS morbid events from general cardiovascular health in childhood many years beforehand, makes the relationship of cardiovascular health status in childhood with cardiovascular events later in life hardly feasible (4).

Currently, the most prevalent paradigm for identifying children at risk for cardiovascular events is based on thepopulation approach and identification of the level and/or number of traditional risk factors(1,5). However risk assessment methods based on, traditional risk factors solely have proven to be suboptimal and unreliable. It was clearly shown that statistical approaches to determine the influence of traditional risk factors (markers) on the occurrence of CVS diseases are over-simplified and inadequate for that purpose. By relying on such markers many high risk children are oversighted and left untreated, and many low risk children are inappropriately targeted for treatment(6).Since early atherosclerosis commonly occurs in the absence of abnormal threshold levels of risk factors, the traditional risk factors based approach has recently shifted to "individual-based approach".

Such a new concept is focused on the identification of asymptomatic structural target organ changes or more recently subclinical functional cardiac or vascular target

organ changes to identify children at risk. Of note, this approach is not only clinically proven but also biologically justified (7).

Surprisingly we routinely still don't take into account structural or functional target organ (TO) changes which are a necessary precondition and intermediate end points for developing CV morbid events regardless of the level of target risk factor.

Assessment of arterial structure and function as well as endothelial function together with assessment of left ventricle geometry and function are some of the potentially useful clinical approaches for early identification of children at increased cardiovascular risk (8, 9, 10).

To summarize, although much of currently recommended medical practice and essentially all evidence-based practice assume the application of population mean effects to individuals, we should try to change our view on this topic from statistical to more biologically approach.

Population based cardiovascular risk assessment model in adults. How does it work?

Almost all current CV risk prediction models (both for children and adults) are based on multivariable regression equations derived from different cohorts in which the levels of traditional or non-traditional risk factors are assigned points to predict CVS outcome (11, 12, 13). In fact we are usually measuring a number of different parameters (metabolic or genetic biomarkers, anthropometric parameters, environmental factors) without having knowledge of their biological meaning in real sense. Although we are cognizant that there is a statistical relation between risk factor and CVS events, it is still not quite clear are they just in casually or casual association with future CVS outcome. Furthermore, the most of the currently used cardiovascular risk prediction models in adults are devised for older individuals (>40 year) having perhaps well-established cardiovascular disease or high life time risk, but low 10-years risk (12).

If we look at the most relevant CVS risk scoring models in adults: Framingham heart study, European Systematic Coronary Risk Evaluation (SCORE), Prospective Cardiovascular Munster (PROCAM) model Reynolds Risk Score, it is not so hard to conclude that strategies based on risk factors measurements are not the best way to select individuals at increased CV risk.

In prospective Atherosclerosis Risk in Communities Study (ARIC) study in adult patients who develop coronary heart disease less than one forth were classified in high risk category, with Framingham risk scores greater than 20 %. Moreover, overall 70 % or more of individuals who developed coronary heart disease have low or medium Framingham risk scores (14, 15). Another, highly cited study by Sachdeva et al, focused on singular traditional risk factors assessment in adults hospitalized with acute coronary artery disease, showed that almost 77 % of patients had normal values of LDL, (below 130 mg/dl), 61,8 % had normal values of triglyceride (below 150 mg/dl) and 45,4 % had normal values of HDL (>40 mg/dl)(16). Study by Futterman et al. also reported the similar percentageof patients (near 50%) without any of the conventional risk factors, developing coronary artery disease (17).

Recently, many authors have tried to improve risk prediction by adding novel recently characterized putative risk factors such as inflammatory and thrombogenic biomarkers. Most notably, lipoprotein(a), C-reactive protein, uric acid, interleukin-6, fibrinogen, plasminogen-activator-inhibitor 1 (PAI-1) levels, serum amyloid A and P, fibrinogen, BM: I-CAM1, V-CAM1, selectin E, von Willebrand factor (18).

All of them are closely related with body fat mass and are markedly elevated in most patients with obesity but don't add much to improve CVS risk prediction over the currently established predictive models.

This is also the case with genetic biomarkers added to conventional risk factor algorithms, such as 9p21 risk alleles which additive benefit was small. Although initially looked very promising, after considering the strength of the available evidence any screening for genetic CAD risk variants or any clinical use of algorithms based on genetic scores are not recommend to calculate future CV risk (19).

The most relevant criticism of any given doctrine based on the traditional cardiovascular factor assessment is that risk prediction models provide risk estimates for populations but not individuals.

Recently Joshi and Nasir found considerable heterogeneity between risk factors and atherosclerotic burden as measured by coronary calcium score. They have reported that in high-traditional risk groups with 0 CAC, the event rates are consistently low and in traditional low-risk groups with elevated CAC (CAC>100), the event rates are consistently high.(20) Of note, to data there are no randomized clinical trials showing that all currently used risk assessment guidelines might improve CVS outcome (21).

Cardiovascular risk assessment in obese children

Although the relationship between adult obesity and cardiovascular disease (CVD) has been shown in adults, the relationship of childhood obesity and cardiovascular disease in adulthood remains unclear. On the other hand the relationship between singular or multiple traditional risk factors in childhood with CVS outcome is well established.

It is demonstrated that about one third of obese children have metabolic syndrome (MetS) which is the name for a group of risk factors dyslipidemia, hypertension, insulin resistance, that raises risk for CVD and other health problems both in children and adults (3). Several different MetS scores and algorithms which predict adult cardiometabolic risk in children have been developed, but diagnostic test results against a clinical outcome, such as CVD, have not been published for most of them, and they have not been validated in other populations. Although we presume that the critical duration of exposure to these risk factors may accumulate at an earlier time point, resulting in premature signs of cardiovascular disease there are no studies to date have directly assessed the impact of MetS on cardiovascular disease outcome. Only Magnussen et al. found that youth with MetS had 2 to 3 times the risk of having high cIMT and T2DM as adults compared with those

free of MetS at youth (22). Of note, obesity alone was shown to have similar predictive value as presence of metabolic syndrome MetS itself (22).

The most comprehensive study investigating the long term influence of obesity on CVS outcome in adulthood involved 276,835 Danish school children for whom measurements of height and weight were available. The risk of any coronary heart disease event, a nonfatal event, and a fatal event among adults was positively associated with BMI at 7 to 13 years of age for boys and 10 to 13 years of age for girls. The associations were linear for each age, and the risk increased across the entire BMI distribution. Furthermore, the risk increased as the age of the child increased (23).

On the other hand, systematic review done by Lloyd et alhave challenged the previously accepted view that the presence of childhood obesity is unindependent risk factor for CVD and that this period should be a priority for public health intervention(24). They have found little evidence to suggest that childhood obesity is an independent risk factor for CVD risk. Correspondingly the next systematic review on this issue also provides little evidence to suggest that childhood overweight and obesity are independent risk factors for metabolic and cardiovascular risk during adulthood. Instead, the data demonstrate that the relationships observed are dependent on tracking of BMI between childhood and adulthood, alongside persistence of dietary patterns and physical activity. Unexpectedly, adjustment for adult BMI uncovered unexpected negative associations between childhood BMI and adult disease, suggesting a protective effect of childhood obesity at any given level of adult BMI (25).

Nevertheless, autopsy studies and few observational studies have shown that CVS risk factors typical for MetS are related to the development of atherosclerosis. One of the most striking of the findings in the Bogalusa study has clearly established the significant risk factors in youth, well described in about 1000 publications and four books (26).

Magnussen et al. studied changes in adiposity (BMI,waist circumference, skinfold thickness), fitness (bicycle testing), plasma lipids (TC, LDL-C, HDL-C, TG), smoking and socioeconomic status (parental education level) in 539 young Australians in the Childhood Determinants of Adult Health Study (1).

Baseline measurements were made in 1985 when participants were 9, 12, and 15 years old, and again between 2004 and 2006. Among those with hypertriglyceridemia in youth, 79% of males and 97% of females had normal values 20 years later. The majority of those with elevated levels of HDL-C at follow-up had normal levels at baseline. Both TC and LDL-C tended to be more constant, and most youngsters with elevations at baseline had them at follow-up, later in life (27).

When participants had adverse lipid profiles at baseline, gained weight, or continued to smoke at follow-up, they were more likely to have dyslipidemia as well. Similarly, those without adverse lipid profiles at baseline were significantly more likely to have dyslipidemia later if they gained weight or continued to smoke in the interim. Last, those who had normal lipid profiles at baseline,but who developed higher risk at follow-up had greater gains in weight, reduced fitness, and failed to rise socioeconomically.

Also of note was the association of long-term aerobic exercise training and upward social mobility from youth to adulthood, with higher HDL-C levels. The data suggested that, whether dyslipidemia was present or not in youth, risk factor modification significantly impacted risk when those individuals became adults some 20 years later. The Pathobiological Determinants of Atherosclerosis in Youth (PDAY) studied 2,876 persons 15–34 years of age who died of external causes, and found a strong concordance between coronary and aortic atherosclerosis and risk factors. The early PDAY score of modifiable risk factors and its variation predict risk in youth and may be useful in identifying high risk individuals. Recent imaging studies reflect the same pathophysiology.

The Cardiovascular Risk in Young Finns study sought to determine whether childhood risk factors were associated with a 6-year change in carotid intima media thickness (CIMT) in young adulthood independent of the current risk factors. In 1,809 subjects who were followed for 27 years from baseline (in 1980, age 3–18 years), CIMT was measured both in 2001 and 2007. Childhood risk factors assessed included LDL-C, HDL-C, BP, obesity,diabetes, smoking, physical activity, and frequencyof fruit consumption. In participants with zero, one, two, and ≥three risk factors, CIMT increased during 6 years by 35, 46, 49, and 61 μm (P = 0.0001) (28). This relationship remained significant after adjustment for adulthood risk. Of the individual childhood variables, physical inactivity and infrequent fruit consumption were associated with accelerated CIMT progression after adjusting for the adult risk factors. The associations of childhood lipid values and BMI with CIMT progression became non significant when adjusted for current (adulthood) risk factor levels. In those risk factors with greater relative importance of adult values– HDL/LDL ratio and obesity – correction of adverse childhood factors in adulthood appeared to attenuate the ill effects of childhood burdens suggesting that interventions to improve lipid and weight abnormalities between youth and adulthood would be productive. International Childhood Cardiovascular Cohort (I3C) consortium investigated the age at which risk factors influenced CIMT later in adulthood. The analyzed parameters of 4380 participants included total cholesterol, blood pressure, BMI, triglycerides measured from age 3–18 years, and CIMT measured in adulthood ages 20–45 years, mean follow-up 22.4 years. The number of childhood risk factors was predictive of higher CIMT when measured at ages 9, 12, 15, and 18 years with higher probability of a raised CIMT as number of risk factors increased.

Conclusion

Similar to CVS risk prediction in adults, currently, the most prevalent paradigm for identifying obese children at high risk for cardiovascular events is based on the identification of the same conventional (traditional) population risk factors and estimation of number and level of these factors. However the association between risk factors and CVS event rates is continuous at all levels of the risk factors and the slope of risk is modest. So the current recommendation to treat risk factors when levels exceed a certain threshold is neither statistically nor medically

justified. Furthermore, the relationship between risk factors and early disease is dependent in large part on intrinsic individual differences in response to risk factors which is inherited and might some day be detectable in genomic analyses.On the other hand, it is rational to conclude that so called risk factors for morbid CVS events are actually risk factors for functional and structural abnormalities of arteries and heart likely to precede occurrence of CVS morbid events. The question is, do we need to follow previous doctrine and try to find another promising marker more specific and sensitive for future CVD and wait another 40 or 50 years for hard CVS outcome to occur, or we should try to change our concept and look at the presence of other pathology substrate likely to progress to CV morbid events.

Left ventricular mass and carotid intima media thickness are nowadays widely chosen as the physiological parameters of interest because their structural alterations precede the development of atherosclerosis and have been correlated with other risk factors for coronary heart disease regardless of risk factors. The only handicap is that information on structural cardiovascular alterations (are suggestive of more established disease) than the incipient mainly functional changes.

We are also now enlightened with proofs that endothelial function represents an integrative index of both "overall CV risk burden factors burden and the sum of all vasculoprotective factors in an individual. Considering that endothelial dysfunction is a well-established response to cardiovascular risk factors and precedes the development of atherosclerosis it is likely that the status of an individual endothelial function may be a missing link between cardiovascular risk factor burden and the propensity to develop atherosclerotic disease.

Over the past decades many methodological approaches have been developed to measure the pathophysiological function of the endothelium in humans and it seems that endothelial function measurement which is now possible may lead to much better estimation of CVS risk and identification of high risk patients. A few of these methods are easily applied in adults and children and have a fair reproducibility.

However no standard recommendation exist, and different method used in research limited ability to make comparation and generalization of reported finding so additional data are needed before these methods can be adopted in clinical evaluation (29–31).

References

1. Hartiala O, Magnussen CG, Kajander S, Knuuti J, Ukkonen H, Saraste A, et al. Adolescence risk factors are predictive of coronary artery calcification at middle age: the cardiovascular risk in young Finns study. J Am Coll Cardiol [Internet]. Elsevier Inc.; 2012 Oct 9 [cited 2015 Jan 3];60(15):1364–70. Available from: http://www.ncbi.nlm.nih.gov/pubmed/22981553
2. Chen X, Wang Y. Tracking of blood pressure from childhood to adulthood: a systematic review and meta-regression analysis. Circulation [Internet]. 2008 Jun 24 [cited 2014 Dec 27];117(25):3171–80. Available from: http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=3568631&tool=pmcentrez&rendertype=abstract
3. Ferreira AP, Oliveira CER, França NM. Metabolic syndrome and risk factors for cardiovascular disease in obese children: the relationship with insulin resistance (HOMA-IR). J Pediatr (Rio J) [Internet]. 2007 Feb 1 [cited 2015 Jan 3];83(1):21–6. Available from: http://www.jped.com.br/conteudo/Ing_resumo.asp?varArtigo=1562&cod=&idSecao=4
4. Lurbe E, Cifkova R, Cruickshank JK, Dillon MJ, Ferreira I, Invitti C, et al. Management of high blood pressure in children and adolescents: recommendations of the European Society of Hypertension. J Hypertens [Internet]. 2009 Sep [cited 2014 Dec 18];27(9):1719–42. Available from: http://www.ncbi.nlm.nih.gov/pubmed/19625970
5. Mahoney LT, Thompson BH, Lauer M, Burns TL, Witt JD. Coronary Risk Factors Measured in Childhood and Young Adult Life Are Associated With Coronary Artery Calcification in Young Adults : The Muscatine Study. 21(2).
6. McGill HC, McMahan C a., Zieske a. W, Malcom GT, Tracy RE, Strong JP. Effects of Nonlipid Risk Factors on Atherosclerosis in Youth With a Favorable Lipoprotein Profile. Circulation [Internet]. 2001 Mar 20;103(11):1546–50. Available from: http://circ.ahajournals.org/cgi/doi/10.1161/01.CIR.103.11.1546
7. Morrison KM, Dyal L, Conner W, Helden E, Newkirk L, Yusuf S, et al. Cardiovascular risk factors and non-invasive assessment of subclinical atherosclerosis in youth. Atherosclerosis [Internet]. 2010 Feb [cited 2015 Jan 3];208(2):501–5. Available from: http://www.ncbi.nlm.nih.gov/pubmed/19699477
8. Litwin M, Niemirska A, Sladowska J, Antoniewicz J, Daszkowska J, Wierzbicka A, et al. Left ventricular hypertrophy and arterial wall thickening in children with essential hypertension. Pediatr Nephrol [Internet]. 2006 Jun [cited 2015 Jan 3];21(6):811–9. Available from: http://www.ncbi.nlm.nih.gov/pubmed/16565870
9. Doyon A, Kracht D, Bayazit AK, Deveci M, Duzova A, Krmar RT, et al. Carotid artery intima-media thickness and distensibility in children and adolescents: reference values and role of body dimensions. Hypertension [Internet]. 2013 Sep [cited 2015 Jan 3];62(3):550–6. Available from: http://www.ncbi.nlm.nih.gov/pubmed/23817494
10. Richey P a, Disessa TG, Somes GW, Alpert BS, Jones DP. Left ventricular geometry in children and adolescents with primary hypertension. Am J Hypertens [Internet]. Nature Publishing Group; 2010 Jan [cited 2015 Jan 3];23(1):24–9. Available from: http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=2795788&tool=pmcentrez&rendertype=abstract
11. Gaziano T a, Young CR, Fitzmaurice G, Atwood S, Gaziano JM. Laboratory-based versus non-laboratory-based method for assessment of cardiovascular disease risk: the NHANES I Follow-up Study cohort. Lancet [Internet]. 2008 Mar 15;371(9616):923–31. Available from: http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=2864150&tool=pmcentrez&rendertype=abstract
12. Kones R. Primary prevention of coronary heart disease: integration of new data, evolving views, revised goals, and role of rosuvastatin in management. A comprehensive survey. Drug Des Devel Ther [Internet]. 2011 Jan [cited 2014 Dec 10];5:325–80. Available from:

http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=3140289&tool=pmcentrez&rendertype=abstract
13. Desai D a, Zakaria S, Ouyang P. Initiation of statin therapy: are there age limits? Curr Atheroscler Rep [Internet]. 2012 Feb [cited 2015 Jan 3];14(1):17–25. Available from: http://www.ncbi.nlm.nih.gov/pubmed/22086344
14. Yang EY, Nambi V, Tang Z, Virani SS, Boerwinkle E, Hoogeveen RC, et al. Clinical implications of JUPITER (Justification for the Use of statins in Prevention: an Intervention Trial Evaluating Rosuvastatin) in a U.S. population insights from the ARIC (Atherosclerosis Risk in Communities) study. J Am Coll Cardiol [Internet]. 2009 Dec 15 [cited 2015 Oct 8];54(25):2388–95. Available from: http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=2829945&tool=pmcentrez&rendertype=abstract
15. Murphy TP, Dhangana R, Pencina MJ, Zafar AM, D'Agostino RB. Performance of current guidelines for coronary heart disease prevention: optimal use of the Framingham-based risk assessment. Atherosclerosis [Internet]. 2011 Jun [cited 2015 Aug 26];216(2):452–7. Available from: http://www.ncbi.nlm.nih.gov/pubmed/21411089
16. Sachdeva A, Cannon CP, Deedwania PC, Labresh KA, Smith SC, Dai D, et al. Lipid levels in patients hospitalized with coronary artery disease: an analysis of 136,905 hospitalizations in Get With The Guidelines. Am Heart J [Internet]. 2009 Jan [cited 2015 Sep 28];157(1):111–7.e2. Available from: http://www.ncbi.nlm.nih.gov/pubmed/19081406
17. Futterman LG, Lemberg L. Fifty percent of patients with coronary artery disease do not have any of the conventional risk factors. Am J Crit Care [Internet]. 1998 May [cited 2015 Oct 8];7(3):240–4. Available from: http://www.ncbi.nlm.nih.gov/pubmed/9579251
18. Lloyd-jones DM. Risk Prediction in Cardiovascular Medicine Cardiovascular Risk Prediction Basic Concepts , Current Status , and Future Directions Rationale for CVD Risk Prediction. 2010;1768–77.
19. Gränsbo K, Almgren P, Sjögren M, Smith JG, Engström G, Hedblad B, et al. Chromosome 9p21 genetic variation explains 13% of cardiovascular disease incidence but does not improve risk prediction. J Intern Med [Internet]. 2013 Sep 25 [cited 2015 Oct 8];274(3):233–40. Available from: http://www.ncbi.nlm.nih.gov/pubmed/23480785
20. Joshi PH, Nasir K. Discordance between Risk Factors and Coronary Artery Calcium: Implications for Guiding Treatment Strategies in Primary Prevention Settings. Prog Cardiovasc Dis [Internet]. Jan [cited 2015 Oct 8];58(1):10–8. Available from: http://www.ncbi.nlm.nih.gov/pubmed/25982215
21. Kengne AP, Patel A, Colagiuri S, Heller S, Hamet P, Marre M, et al. The Framingham and UK Prospective Diabetes Study (UKPDS) risk equations do not reliably estimate the probability of cardiovascular events in a large ethnically diverse sample of patients with diabetes: the Action in Diabetes and Vascular Disease: Preterax. Diabetologia [Internet]. 2010 May [cited 2015 Oct 8];53(5):821–31. Available from: http://www.ncbi.nlm.nih.gov/pubmed/20157695
22. Magnussen CG, Koskinen J, Chen W, Thomson R, Schmidt MD, Srinivasan SR, et al. Paediatric metabolic syndrome predicts adulthood metabolic syndrome, subclinical atherosclerosis, and type 2 diabetes mellitus but is no better than body mass index alone: the Bogalusa Heart Study and the Cardiovascular Risk in Young Finns Study. Circulation [Internet]. 2010 Oct 19 [cited 2015 Oct 7]; 122(16):1604 – 1611. Available from: http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=3388503&tool=pmcentrez&rendertype=abstract
23. Baker JL, Olsen LW, Sørensen TIA. Childhood body-mass index and the risk of coronary heart disease in adulthood. N Engl J Med [Internet]. 2007 Dec 6 [cited 2015 Oct 26];357(23):2329–37. Available from: http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=3062903&tool=pmcentrez&rendertype=abstract
24. Lloyd LJ, Langley-Evans SC, McMullen S. Childhood obesity and adult cardiovascular disease risk: a systematic review. Int J Obes (Lond) [Internet]. 2010 Jan [cited 2015 Oct 6];34(1):18–28. Available from: http://www.ncbi.nlm.nih.gov/pubmed/19434067
25. McMullen S. Childhood obesity: the impact on long-term risk of metabolic and CVD is not necessarily inevitable. Proc Nutr Soc [Internet]. 2014 Jul 16 [cited 2015 Oct 22];73(03):389–96. Available from: http://www.ncbi.nlm.nih.gov/pubmed/25027289
26. Berenson GS. Bogalusa Heart Study: a long-term community study of a rural biracial (Black/White) population. Am J Med Sci. 2001;322(5):293–300.
27. Laitinen TT, Pahkala K, Venn A, Woo JG, Oikonen M, Dwyer T, et al. Childhood lifestyle and clinical determinants of adult ideal cardiovascular health: the Cardiovascular Risk in Young Finns Study, the Childhood Determinants of Adult Health Study, the Princeton Follow-Up Study. Int J Cardiol [Internet]. 2013 Oct 30 [cited 2015 Oct 9];169(2):126–32. Available from: http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=3863693&tool=pmcentrez&rendertype=abstract
28. Oikonen M, Laitinen TT, Magnussen CG, Steinberger J, Sinaiko AR, Dwyer T, et al. Ideal cardiovascular health in young adult populations from the United States, Finland, and Australia and its association with cIMT: the International Childhood Cardiovascular Cohort Consortium. J Am Heart Assoc [Internet]. 2013 Jun [cited 2015 Oct 13];2(3):e000244. Available from: http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=3698791&tool=pmcentrez&rendertype=abstract
29. Tryggestad JB, Thompson DM, Copeland KC, Short KR. Obese Children Have Higher Arterial Elasticity Without a Difference in Endothelial Function: The Role of Body Composition. Obesity [Internet]. Nature Publishing Group; 2012;20(1):165–71. Available from: http://dx.doi.org/10.1038/oby.2011.309/nature06264
30. Raitakari OT, Rönnemaa T, Järvisalo MJ, Kaitosaari T, Volanen I, Kallio K, et al. Endothelial function in healthy 11-year-old children after dietary intervention with onset in infancy: the Special Turku Coronary Risk Factor Intervention Project for children (STRIP). Circulation [Internet]. 2005 Dec 13 [cited 2015 Jan 3];112(24):3786–94. Available from: http://www.ncbi.nlm.nih.gov/pubmed/16330680
31. Arrebola-Moreno AL, Laclaustra M, Kaski JC. Noninvasive assessment of endothelial function in clinical practice. Rev Esp Cardiol (Engl Ed) [Internet]. 2012;65(1):80–90. Available from: http://www.ncbi.nlm.nih.gov/pubmed/22099430

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PREGLED LITERATURE – REVIEW ARTICLE

Gestalt Therapy as Preventive Measure in Everyday work in Paediatricians Practice

Geštalt terapija kao mera prevencije u svakodnevnom radu u pedijatrijskoj praksi

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Summary

Gestalt therapy as a humanistic therapy with holistic approach uses techniques that focuses on gaining an awareness of emotions and behaviors in the present rather than in the past, here rather that there. Due to etiology of most commonly health disturbance in everyday paediatrician's practice psychological reasons is one of commonly mentioned risk factors. This article shows how gestalt therapy can be used as preventive measures and support to everyday paediatrician's practice. Aim of this work was to implement gestalt therapy in paediatrician's practice due to achieving completely holistic health care and prevent possible episode of asthma attack, eczema or vomiting or diarrhea as most common symptoms in practice. Beside medical treatment, we practice gestalt therapy together with children and parents. Number of asthma attack episodes decreased same as intensity. This was really considerable in ordinary "stressful" situations that were earlier very significant detail in anamnesis. Same was with vomiting or diarrhea. Picture of gestalt therapy in named situations was one based on a horizontal relationship. Exactly that provided me a holistic approach as paediatrician and therapist. Together with children and parents we explored nuances within relationships (paying careful attention to present experience). Through different cases we realized that important (support) factor for children with asthma, eczema and some gastrointestinal disorders and their recovery is one of parents, mostly mother.

Keywords:gestalt therapy,holistic health, asthma, allergy, eczema, gastrointestinal disorders, quality of life

Sažetak Od svih priznatih i poznatih terapija, geštalt psihoterapiju možemo pozicionirati u sam vrh svih psihoterapija po svome holističkom pristupu koji se primenjuje u radu sa pacijentima**.** Na osnovu podataka o etiologiji različitih zdravstvenih tegoba koje se sreću u pedijatrijskoj ordinaciji psihološki faktori jedni su od najčešće spominjanih. Cilj rada je bio da, u skladu sa dostizanjem što potpunijeg holističkog pristupa zdravstvenom zbrinjavanju u pedijatrijskoj praksi, implementiramo geštalt terapiju i na taj način podržimo mere prevencije koje bi umanjile broj asmatičnih napada, ekcema, povraćanja ili proliva (kao najčešćih simptoma u pedijatrijskoj ordinaciji). Individualni rad sa decom i roditeljima je bio osnovni metod implementacije geštalt terapije u pedijatrijskoj ordinaciji. Broj akutnih asmatičnih napada se smanjio, kao i njihova jačina. Ovi rezultati su bili izuzetno značajni u tzv. stresnim situacijama. Slična situacija je bila i sa povraćanjem ili dijarejama. Rad geštalt terapeuta odnosio se na horizontalni odnos. Upravo takav odnos je omogućio holistički pristup kako pedijatra tako i geštalt terapeuta. Zajedno sa decom i roditeljima istraživali smo nijasne u odnosima koje kreiraju. U radu sa različitim pacijentima uvideli smo da važan faktor za decu sa astmom, ekcemom ili nekim gastrointestinalnim problemom, kao i za njihov oporavak, ima uloga jednog od roditelja, najčešće majke.

Ključne reči: geštalt terapija, holističko zdravlje, astma, alergija, ekcem, gastrointestinalne tegobe, kvalitet života

How Gestalt works

Gestalt therapy is built upon two central ideas: that the most helpful focus of psychotherapy is the experiential present moment, and that everyone is caught in webs of relationships; thus, it is only possible to know ourselves against the background of our relationships to others (1).

Gestalt therapy as a humanistic therapy uses techniques that focuses on gaining an awareness of emotions and behaviors in the present rather than in the past, here rather that there.

That is a reason that gestalt therapists use questions such as: "What are you doing (or be aware of) right now? How are you doing it? Where are you right now?" Very important for therapy process is rule that therapist does not interpret experiences for the patient, but therapist and patient, do, work together to help the patient understand him/herself (2). That is a reason that gestalt therapists use to say for themselves that they work "Here and Now, What and How".

Gestalt therapy begins with the very first contact. There is no separate diagnostic or assessment period. Instead, assessment and screening are done as part of the ongoing relationship between patient and therapist. This assessment includes determining the patient's willingness and support for work using gestalt method (either in individual or group work or constellations), as well as determining the compatibility between the patient and the therapist (3).

As Clarkson define: "Gestalt practice represents a complete body of theory and technique which appears to use the major tenets of existentialism in the counseling and psychotherapeutic situation".Clarkson has summarized and updated a number of "fundamentals" of the gestalt approach, including: a dialogic therapeutic relationship, wholeness, the organismic tendency towards self-regulation, authenticity of the psychotherapist, respect for the integrity of defense and the challenge to change, the here-and-now, and the philosophical and ecological fact of response-ability. Gestalt psychotherapy emphasizes the movement towards health (and healthy self-regulation) and as such challenges a strictly 'medical model' view of disease: symptom - diagnosis – "cure" (4).

The founding father of gestalt psychotherapy, Fritz Perls, was very clear about this: "The description of psychological health and disease is a simple one. It is a matter of the identifications and alienations of the self: if a man identifies with his forming self, does not inhibit his own creative excitement and reaching towards the coming solution; and conversely, if he alienates what is not organically his own and therefore cannot be organically interesting, but rather disrupts the figure background, then he is psychologically healthy" (5).

Number of researches and articles were published until today regarding to child development, different pathology and use of gestalt therapy. Gari M. Yontef decline that "all concepts, principles and theoretical discussions presented in the body of gestalt literature available today can be related to child growth and development as well as to child pathology".Shmuckler and Friedman have connected personality theory and child development through play: "Since play can be regarded as a central developmental process, it provides an important link between understanding healthy development and clinical process".

The most important fact is that gestalt therapy has holistic approach to the person (patient/client). This is one of most important reason (beside work in "here and now") that this direction of psychotherapy is used in everyday physicians practice to support different medical treatments (6).

Looking from the side of physicians, the holistic physician will support the patient in confronting the problems beneath the surface that are the cause of the disease from a holistic perspective. The holistic process theory of healing and the related quality of life theories state that the return to the natural state of being is possible whenever the person gets the resources needed for the existential healing (7). The resources needed are "holding" in the dimensions awareness, respect, care, acknowledgment, and acceptance with support and processing in the dimensions feeling, understanding, and letting go of negative attitudes and beliefs. Existential healing is not a local healing of any tissue, but a healing of the wholeness of the person, making him much more resourceful, loving, and knowledgeable of himself, his own needs and wishes. In letting go of negative attitudes and beliefs, the person returns to a more responsible existential position and an improved quality of life. The philosophical change of the person healing is often a change towards preferring difficult problems and challenges, instead of avoiding difficulties in life (7).

Due to etiology, the most of health disturbance in everyday paediatrician's practice has some psychological base (beside life style, as one of commonly mentioned risk factor). Asthma, allergy, and eczema are believed to have a psychosomatic dimension (7), which can be understood due to the fact that many children and adolescents who have asthma, allergy, or eczema grow out of it. This is very fortunate because many modern-day children suffer from allergies.

Number of medications exist today on pharmaceuticals market and might relieve the children from the worst of these symptoms, but the problems often remain throughout life, as a chronic disease (7).

We often see that the child's quality of life and health status from the perspective of holistic medicine often is a thermometer for the thriving of the whole family (7). Depending on the phase of development, young children need the confirmation from the society (8).

Main idea for this collaborative (combined) work as paediatrician and gestalt therapist came from McPherson definition of chronically sick children who have some special needs of care: "Children with special health care needs ate those who have or are at risk for a chronic physical, developmental, behavioral, or emotional condition and who also require health and related services of a type or amount beyond that required by children generally" (9).

How we worked

Discussing with parents who were willing to work on personal development, to improve the general quality of life in the family and their relationship with the children, we started with individual work with them and their child, in the same time while children's treatment went on. I created dual process (parallel process) with children and family, as paediatrician and gestalt therapist.Beside medical treatment, we practice gestalt therapy together with children and parents and in some cases with parents (mostly mothers) individually. We established and implement this way of holistic approach on a weekly basis.

Children also were helped (10, 11) if their parents agreed to do work on personal development, to improve the general quality of life in the family and their relationship with the child. We often see that the child's quality of life and health status from the perspective of holistic medicine often is a thermometer for the thriving of the whole family (6).

Actually, children were perfect (without mistakes) thermometer for the thriving of the whole family, their relationships, boundaries, interpersonal conflicts, etc.

The improvement of the named symptoms is noticed after only a few sessions (5-6) with a paediatrician skilled in using gestalt therapy tools and able to coach the children and parents successfully through a few weeks (8-12) intensive gestalt therapy while children used prescribed medications and did all necessarily diagnostic procedures and checkup controls. According to our data base for purpose of this article we present just health condition generally (without laboratory analyses, quality and quantity of prescribed medications, etc.) Number of asthma attack episodes decreases, same as intensity. Period between two episodes last longer. This fact was very important (for continue therapy) in ordinary "stressful" situations that were earlier most significant risk factor. Similar result we got with vomiting or diarrhea. Number of episodes of named symptoms decreased after a period of 2 months (8 sessions) for a one third.

Gestaltz therapy integrated in paediatricians practice

The inspiration for implementation of my gestalt approach to sick children and their parents came firstly from a practical concern to set up work with children (and/or their parents) more on the map within the holistic health care. Looking at them, not only as patients with certain medical disturbance who need medications and different diagnostic procedures and later, possible, prolonged treatments, but also as *figure* with different background, unique environment, the uniqueness of each person's experience, awareness of what is present in the here and now, and creation of shared understanding through dialogue. Inter-reaction between the individual and the environment, and within the individual and the environment was viewed through the so-called *ground*, the field they created with me led me to stay there (in that field) and look in same. Figure might be anything within the environment or situation that was the focus of attention of that moment. Groundwas the environment or background surrounding the figure. Ground includes all that is within one's field of perception (physical and emotional), but that is not the focus of attention (but is important to take in consideration). Figures exist within *boundaries*that define and separate them from the environment.

My picture of gestalt therapy in named situations was one based on a *horizontal relationship*. Exactly that provided me a holistic approach as paediatrician and therapist. Together with children and parents we explored nuances within relationships (paying careful attention to present experience).

Two written work were very useful for complete named work, both as paediatrician and therapist. One was article written by Kate Tudor: "Integrating Gestalt in Children's Groups" where she described gestalt "contact cycle" both as a practical tool for such work as well as a theoretical framework for understanding phases of child development and for integrating other psychotherapeutic approaches (12). Second one was book "Brief Gestalt Therapy" written by Gaie Houston, focusing on brief and time-limited therapies. This book sets out to describe how gestalt therapy can be used to good purpose and with good outcomes, working either with individuals or groups (13).

Mentioning the contact cycle and interruptions of the same we should to be aware that the contemporary model often cited is Clarkson. This "Cycle of Gestalt formation and destruction" is usually known as "contact cycle" or "gestalt cycle".

The figure 1 illustrates the seven stages of the "gestalt cycle" of experience: *sensation*, *awareness*, *energy mobilization*, *action*, *contact*, *resolution* and *withdrawal of attention*. Any human experience begins with sensory arousal that is brought about by one or more of the five senses (touch, smell, sight, hearing, and taste).

Figure 1: Cycle of Gestalt formation and destruction (Adapted by «The cycle of Gestalt formation and destruction», Petruska Clarkson, p. 33., 1999.)

This arousal stems from elements in the environment and leads to an awareness of figures. Awareness occurs when figures emerge from sensations. Awareness focuses attention on important elements (figures) within the environment (ground) so that important elements emerge as clearly differentiated figures. Awareness is continuous and ongoing. Energy is the potential or capability to do work. Awareness brings about an awakening of internal energy, which produces the additional strength necessary to bring important background elements into focus (make figural). In the Gestalt sense, energy mobilization refers to the work that takes place in order to produce a clearly differentiated (14).

The same cycle, with the concepts explained in language accessible to children, was suggested by Kate Tudor (this "translation" on children's language described Kate Tudor cited in above mentioned article):

- Sensation ~ feel
- Awareness ~ know
- Energy mobilization ~ think
- Action ~ do/act
- Contact ~ make it
- Resolution ~ enjoy
- Withdrawal of attention ~ let go

It is possible to interrupt any phase of named cycle. Place of interruption will define defense mechanisms. The individual is encouraged to become aware of his or her own feelings and behaviors, and their effect upon his environment in the here and now. The way in which he or she interrupts or seeks to avoid contact with the present environment is considered to be a significant factor when recovering from psychological disturbances. By focusing the individual on their self-awareness as part of present reality, new insights can be made into their behavior, and they can engage in self-healing. Some of the contact interruption occur through projection (seeing outside one's self what belongs to one's self), introjection (swallowing whole instead of assimilating, chewing, and digesting), retroflection (directing impulses towards the self that rightly should be directed to the other, as in anger directed toward self-causing depression or psychosomatic symptoms), and confluence (dissolving the self-other boundary and merging with the other). By focusing the individual on how contact-making occurs or is disturbed, new insights can be made and the fluid process of adequate contacting resumed.

Through different cases we realized that important (support) factor for children with asthma, eczema and some (very often) gastrointestinal disorders and their recovery is one of parents (mostly mother). Her/his (mother/father) functionality provide certain, non-prolonged recovery.

Very serious obstacle was to explain and mobilize parents to improve quality of life. It had be done by coaching them creating a schedule of everyday daily activities (different for everyone individually) (15). Children with allergy and asthma, same with gastrointestinal disorders were also supported and helped by their parents who were able to work on personal development, to improve the general quality of life in the family and their relationship with the child**.**

Main concept for successful work was the only possible base that the essence of human life is contact. Contact is where one person meets another person, or meets the outside world. Every organism is capable of effective and fulfilling contact with others in their environment and pursues ways of having contact with others so that the organism can survive and grow to maturity. All contact is creative and dynamic. If contact is not interfered with by what Perls-Goodman called disturbances of the contact boundary, the individual can grow, through assimilation of new experiences.

In our combined therapy, the parents and children were encouraged to experience their own feelings and behaviors in the here and now. Together we tried to recognize the way contact was interrupted. The way in which parents (or children) interrupt contact with the present environment is considered to be a significant factor in creating and maintaining dysfunctional patterns of behavior. Cure of the contact interruptions (work on) would provide healthy relationship between parents and children, and that should provide positive psychological effects (acknowledgment, awareness, respect, care, and acceptance), good health conditions (less chronicity, less acute attack episodes, less comorbidity, less complications) and better life style. There is completely holistic health care (mind, body, spirit). This is a place to count on gestalt therapy as preventive measure in everyday paediatrician's practice. This way of work, paediatrician and gestalt therapist in collaboration, could provide help and support, both children and parents on multidimensional level (physical, social, emotional, kindergarten or school or work).

As professionals, doing our own mission (we are trained for) we might expect quality work improvement if, without any boundaries, corporate and work together as multidisciplinary team (paediatricians, gestalt therapists, psychologists, nurses). This is not a small task, but can be done over time.

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References

1. Latner J. The Theory of Gestalt Therapy, in Gestalt therapy: Perspectives and Applications. Cambridge, MA: Gestalt Press; 2000.
2. Polster E. Every Person's Life is Worth a Novel. New York: Norton; 1987.
3. Hausner S. Čak i po cijenu života, Sistemske konstelacije u radu s oboljelima. Zagreb: Pistacio d.o.o.; 2015.
4. Yontef, G. Resent Trends in Gestalt Therapy in United States and What We Need to Learn from Them. The British Gestalt Journal 1, 1991; 5-20
5. Perls FS, Hefferline RF, Goodman P. Gestalt Therapy: Excitement and Growth in the Human Personality. New York: Bantam; 1973.
6. Ginger S. Geštalt terapija: umetnost kontakta. Beograd: Psihopolis; 2010. p.83-111.
7. Ventegodt S, Morad M, Merrick J. Clinical Holistic Medicine: Developing from Asthma, Allergy, and Eczema. TheScientificWorldJOURNAL 4. 2004; 936–942
8. Hercigonja KD. Ethical Dilemas in Children and Adolescents Looking from the Viewpoint of Changing families and Society. Proceedings of the 1st International and Interdisciplinary Congress – Contemporaneity, Ethics, Awareness, Psychotherapy. 2015 Sept. 18-20; Zagreb, Hrvatska. Beograd: Srpsko udruženje za geštalt psihoterapiju; 2015
9. Jackson AP, Vessey J, Schapiro N. Primary Care of the Child with the Chronic Condition. 5 th ed. St. Luis: Mosby Elsevier Inc.; 2010.
10. Ventegodt S, Morad M, Vardi G, Merrick J. Clinical holistic medicine: holistic treatment of children. TheScientificWorldJOURNAL 4. 2004; 581–588

11. Bomon H. Duša kao dimenzija iskustva. Zagreb: Intronaut; 2014. p.76-88
12. Tudor K. Integrating Gestalt in Children's Groups. The British Gestalt Journal 1. 1991; 21-28
13. Houston G. Brief Gestalt Therapy. London: SAGE Publications Ltd; 2003.
14. Pecotić L. Awareness and Contemporaneity: Information, technology, Communication. Proceedings of the 1st International and Interdisciplinary Congress – Contemporaneity, Ethics, Awareness, Psychotherapy. 2015 Sept. 18-20; Zagreb, Hrvatska. Beograd: Srpsko udruženje za geštalt psihoterapiju; 2015.
15. Joyce P, Sills C. Skills in Gestalt, Counseling & Psychotherapy. 3rd ed. London: SAGE Publications Ltd; 2014.

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PREGLED LITERATURE – REVIEW ARTICLE

Prevencija zlostavljanja i zanemarivanja dece

Prevention of Child Maltretmant and Abuse

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Sažetak Nasilje nad decom ne predstavlja izolovani problem (pojedinačni ili porodični), već problem društva u celini, i kao takvom, treba mu se pristupiti oraganizovano, sistematski, na svim društvenim nivoima.
Činjenica da jos uvek ne postoje adekvatni podaci o obimu i posledicama zlostavljanja i zanemarivanja dece u velikoj meri usporava donošenje odgovarajućih mera prevencije. Na žalost, danas se većina preventivnih mera fokusira na žrtve i počinioce, dok se akcije koje se bave rešavanjem osnove problema stavljaju u drugi plan.
Stvaranje sigurnog i podsticajnog okruženja za decu postiže se kroz primarnu, sekundarnu i tercijarnu prevenciju. Sva tri nivoa prevencije u međusobnoj su interakciji, prožimaju se i dopunjuju, a pojedinačno ih treba posmatrati isključivo kao delove prevencije u celini.

Ključne reči: zlostavljanje, zanemarivanje, deca, prevencija

Summary Violence against childrens not unisolated problem, individual or family, but a problem of society as a whole, and as such, should be assessed and organized, systematicaly, at all social levels.
The fact that there are still no adequate data on the extent and consequences of child abuse and neglect greatly slows the adoption of appropriate preventive measures. Unfortunately, today, most prevention measures focused on the victims and perpetrators, and the actions that deal with problem solving basics put into the background.
Creating a safe and supportive environment for childrens should be achieved through primary, secondary and tertiary prevention. All three levels of prevention interact, overlap and complement each other, but individually they should be regarded solely apart of prevention in general.

Keywords:maltretmant, abuse,children, prevention

Uvod

Nasilje nad decom je istorijski poznata pojava koja je stara koliko i ljudska civilizacija. To je problem koji prožima sva društva, sve kulture i sve regione sveta. Nasilje nad decom predstavlja grubo kršenje prava deteta, izaziva patnju, ozbiljno ugrožava razvoj, dobrobit, pa i sam život deteta, i ostavlja višestruke, dugotrajne, i krajnje ozbiljne posledice po fizičko i mentalno zdravlje, psihosocijalni razvoj, i budući život. Specifičnost statusa deteta jeste njegova zavisnost i bespomoćnost koja ga čini podložnim različitim vidovima nasilja. Porodica koja bi detetu trebalo da pruža neophodnu ljubav, sigurnost, i osećaj da je u njoj najzaštićenije, ujedno može da bude i izvor njegove najintenzivnije ugroženosti.

Deca su, istorijski gledano, bila izložena različitim vidovima i formama nasilja. Tek u drugoj polovini 20. veka javljaju se prvi pokušaji definisanja ove ukorenjene pojave(1). Savremeno definisanje nasilja nad decom polazi od potreba, interesa i osobenosti ličnosti deteta. Danas se nasilje nad decom posmatra kao niz nehumanih odnosa, koji se kreću od zapostavljanja - nedovoljne brige za razvojne potrebe i ličnost deteta, preko zanemarivanja - odsustva ili ograničene mogućnosti zadovoljavanja razvojnih i osnovnih potreba i socijalne sigurosti deteta, do zlostavljanja - ugrožavanja psihičkog i fizičkog integriteta ličnosti deteta i napada na njegovu samosvojnost i posebnost (2).

Pravo na prevenciju i zaštitu od svih oblika nasilja predstavlja osnovno pravo svakog deteta, utvrđeno u Konvenciji o pravima deteta (3) i drugim dokumentima Ujedinjenih nacija, Saveta Evrope i ostalih međunarodnih organizacija koje je država Srbija ratifikovala kao članica tih organizacija(4). Potpisivanjem Konvencije o pravima deteta, naša zemlja je preuzela obavezu da preduzima mere za sprečavanje fizičkog i mentalnog nasilja nad decom, zloupotrebe i zanemarivanja, svih oblika seksualnog izrabljivanja, i seksualne zloupotrebe dece, nasilnog odvođenja i trgovine decom, svih drugih oblika eksploatacije štetnih za dete, mučenja, nehumanih i ponižavajućih postupaka, i kažnjavanja. Obavezala se da obezbedi zaštitu deteta od svih oblika nasilja u porodici, u institucijama, i široj društvenoj sredini. Konvencija određuje obavezu države da obezbedi mere podrške za saniranje posledica zlostavljanja, fizički i psihički oporavak žrtvi nasilja, i njihovu socijalnu reintegraciju (4).

Poštovanje prava i unapređenje položaja dece, a posebno sprečavanje i zaštita dece od nasilja, zagarantovano je Ustavom (5) i brojnim strateškim dokumentima i zakonima iz oblasti socijalne i zdravstvene zaštite, obrazovanja, pravosuđa i policije. U svim dokumentima definisana je opšta politika zemlje prema deci, dok je zaštita dece od svih oblika zlostavljanja, zanemarivanja, iskorišćavanja, i nasilja istaknuta kao jedan od prioritetnih ciljeva (6, 7).

Modeli i definicije zlostavljanja i zanemarivanja

Proces prevencije i zaštite dece od zlostavljanja i zanemarivanja zahteva multidisciplinarni pristup, te je zbog toga opšta saglasnost u odnosu na definiciju zlostavljanja i zanemarivanja prvi uslov za uspešnost procesa zaštite deteta.

Neadekvatni odnosi prema deci koji štete njihovom razvoju, opisuju se kroz različite pojmove: zlostavljanje, zloupotreba, zanemarivanje, zapuštanje, osujećenje razvojnih potreba, eksploatacija i sl. Pojam zloupotrebe obuhvata one odnose prema deci u kojima se ona koriste radi nekih interesa i potreba drugih osoba na račun potreba, interesa i ličnosti dece. Zanemarivanje obuhvata propuste u odnosu prema deci koji mogu da osujete zadovoljavanje njihovih razvojnih potreba. Termin zlostavljanje se ponekad koristi samo za označavanje onih događaja, situacija, stanja ili ponašanja kojima se povređuje integritet i oštećuje razvoj deteta. Zlostavljanje je, međutim, širi pojam koji obuhvata aktivne i pasivne aspekte zlostavljanja dece. Aktivna zloupotreba moći pretpostavlja direktno nanošenje telesne i duševne povrede i oštećenja. Pasivna zloupotreba moći podrazumeva propuste i zanemarivanje fizičkih, psihičkih i emocionalnih potreba deteta, što ugrožava razvoj ili dovodi do propusta u nezi i osiguranju bezbednosti, koji imaju za posledicu povrede i oštećenja. Ovo znači da dete može biti zlostavljano tako što mu se nanose povrede ili oštećenja, ali i propuštanjem (nečinjenjem) radnji koje omogučavaju nesmetan razvoj i sigurnost deteta.

Deca mogu biti zlostavljana u porodici koja se stara o njima ili u okviru institucije ili zajednice u kojoj borave. Zlostavljanje deteta može doći od strane poznatih i nepoznatih osoba. Zlostavljanje i zanemarivanje podrazumevaju odnose i ponašanja pojedinaca i institucija kojima se ugrožava ili ometa normalan psihički i fizički razvoj, integritet ličnosti ili se osujećuje zadovoljenje osnovnih potreba. U savremenoj literaturi pod pojmom zlostavljanja i zanemarivanja dece objedinjuju se svi oblici nasilja nad decom. Jedna od definicija zlostavljanja i zanemarivanjapodrazumeva postupke roditelja ili detetovih staratelja kojima se detetu nanosi telesna i/ili emocionalna bol ili se zanemaruje u toj meri da je ugroženo njegovo emocionalno zdravlje i razvoj (8).

Prema definiciji Svetske zdravstvene organizacije, zloupotreba ili zlostavljanje deteta obuhvata sve oblike fizičkog, odnosno emocionalnog zlostavljanja, seksualnu zloupotrebu, zanemarivanje ili nemaran postupak, kao i komercijalnu ili drugu eksploataciju, što dovodi do stvarnog ili potencijalnog narušavanja zdravlja deteta, njegovog preživljavanja, razvoja ili dostojanstva u okviru odnosa koji uključuje odgovornost, poverenje ili moć (9). Ova definicija prihvaćena je kod nas u Opštem protokolu za zaštitu dece od zlostavljanja i zanemarivanja (10), a prihvaćena je i od strane Međunarodnog udruženja za prevenciju zloupotrebe i zanemarivanja dece (11).

Naučna saznanja i istraživanja u ovoj oblasti pomažu da se odrede efikasni profesionalni pristup detetu koje ima potrebu za zaštitom. Preko procesa procene se dolazi do činjenica o detetovim specifičnim zdravstvenim i razvojnim potrebama i okolnostima života porodice. U tom procesu veliku važnost ima i sagledavanje i razumevanje etiologije zlostavljanja. Jedan od najčešćih etioloških modela zlostavljanja i zanemarivanja (pored ostalih) zasniva se na razumevanju višefaktorske uslovljenosti zlostavljanja.

Ovaj etiološki model, takozvani "ekološki model zlostavljanja" posmatra zlostavljanje kroz uticaj rizičnih i zaštitnih faktora, naglašavajući značaj njihovih međusobnih interakcija (12):

- roditeljski faktori (samohrani roditelji, mladi roditelji, roditelji koji su i sami bili žrtve zlostavljanja u detinjstvu, zavisnici od psihoaktivnih supstanci, roditelji niskog obrazovnog nivoa i dr.),
- sociokulturni faktori (niski prihodi, nezaposlenost, socijalna izolacija, visoka stopa kriminaliteta),
- faktori sredine (porodica, institucije, škola),
- faktori vezani za samo dete (neželjeno dete, prevremeno rođeno dete, dete ometeno u razvoju i dr.).

Pored opšte definicije zlostavljanja deteta, prihvaćene su i definicije četiri posebna tipa zlostavljanja deteta: fizičko zlostavljanje, seksualna zloupotreba, emocionalno zlostavljanje i zanemarivanje deteta. U nekim klasifikacijama izdvaja se i eksploatacija kao poseban oblik zloupotrebe deteta, a u novije vreme se izdvaja i vršnjačko nasilje(13, 14).

Fizičko zlostavljanje deteta je ono koje dovodi do stvarnog ili potencijalnog fizičkog povređivanja usled neke interakcije ili odsustva interakcije, koja potpada pod razuman okvir nadzora roditelja ili osobe koja je na položaju na kome ima odgovornost, moć nad detetom ili njegovo poverenje (9).
To je namerno nanošenje ozleda i nesprečavanje istih. Može se ispoljiti kao izolovani incident ili ponavljana aktivnost hroničnog karaktera. Ova vrsta zlostavljanja za posledicu ima ozlede i znakove koji su posledica ozleda, a nalaze se na raznim delovima tela. Neke vrlo ozbiljne ozlede, kao što su povrede glave, kod vrlo male dece nisu odmah vidljive. Fizička povreda se može naneti detetu i tako što roditelj ili staratelj namerno izaziva simptome bolesti kod deteta. Ove situacije se obično nazivaju indukovanim bolestima ili sindrom Minhauzen (15).
Emocionalno zlostavljanje podrazumeva ponavljane radnje ili izostanak radnji roditelja ili staratelja, što kao posledicu ima ozbiljne i trajne posledice na ponašajne, kognitivne, afektivne i druge mentalne smetnje u detetovom emocionalnom razvoju. Ovakvo ponašanje roditelja i staratelja razvija osećaj bezvrednosti i odbačenosti kod

deteta. Emocionalno zlostavljanje može se definisati kao hroničan stav ili postupanje roditelja, odnosno drugih staratelja, koje ometa razvoj detetove pozitivne slike o sebi (16).U emocionalnom zlostavljanju, povrede nisu fizički vidljive, ali posledice mogu biti teže nego kod bilo koje druge vrste zlostavljanja.

Emocionalno zlostavljanje podrazumeva i razvojno i uzrastno neodgovarajuća očekivanja od deteta, ili učestalo zastrašivanje i izazivanje nesigurnosti.

Seksualna zloupotreba deteta je uključivanje deteta u seksualnu aktivnost koju ono ne shvata u potpunosti, sa kojom nije saglasno ili za koju nije razvojno doraslo, nije u stanju da se sa njom saglasi ili onu kojom se krše zakoni ili socijalni tabui društva (9).

Seksualna zloupotreba deteta je aktivnost između deteta i neke odrasle osobe ili drugog deteta koje ima, zbog svog uzrasta ili razvoja, položaj koji mu daje odgovornost, poverenje ili moć i gde aktivnost ima za cilj da pruži uživanje ili zadovolji potrebe druge osobe. Ovo može obuhvatati ali se ne ograničava samo na: navođenje ili primoravanje deteta da se upusti u bilo kakvu kontaktnu ili nekontaktnu seksualnu aktivnost, eksploatatorsko korišćenje deteta za prostituciju ili druge nezakonite seksualne radnje i eksploatatorsko korišćenje dece za pornografske predstave i materijale.

Zanemarivanje predstavlja nemar ili propust roditelja ili staratelja da obezbedi razvoj deteta u svim oblastima zdravlja, obrazovanja, emocionalnog razvoja, ishrane, smeštaja i bezbednih životnih uslova, a u okviru razumno raspoloživih sredstava porodice ili staratelja, što narušava ili može sa velikom verovatnoćom narušiti zdravlje deteta ili njegov fizički, mentalni, duhovni, moralni ili društveni razvoj. Ono obuhvata i propust u obavljanju pravilnog nadzora i zaštite dece od povređivanja u onolikoj meri u kojoj je to izvodljivo (9).

Zanemarena deca koja ne dobijaju adekvatnu emocionalnu, kognitivnu, socijalnu i fizičku stimulaciju, fizičku negu i ishranu mogu pretrpeti nepovratne zastoje u različitim aspektima svog razvoja. Iako bi samo jedan jedini incident zanemarivanja mogao imati ozbiljne posledice, većina slučajeva zanemarivanja može se prepoznati po obrascu odsustva nege deteta.

Eksploatacija/korupcija deteta podrazumeva navođenje na socijalno neprihvatljivo i destruktivno ponašanje. Odnosi se i na korišćenje deteta za rad ili druge aktivnosti u korist drugih osoba. Eksploatacija deteta se može ostvarivati dopuštanjem ili ohrabrivanjem deteta na: antisocijalno ponašanje (npr. prostitucija, učešće u pornografskim medijima, kriminalne aktivnosti, zloupotrebu supstanci, nasilno ponašanje ili "kvarenje" drugih osoba); razvojno neodgovarajuće ponašanje (parentifikacija ili infantilizacija deteta, proživljavanje roditeljevih neispunjenih snova); gubitak razvojno adekvatne autonomije ličnosti kroz ekstremnu umešanost, sveprisutnost i/ili dominaciju; nedopuštanje detetu da razvija svoja shvatanja, osećanja i želje; potpuno rukovođenje detetovim životom i ograničavanje kognitivnog razvoja.

Vršnjačko zlostavljanje označava kinjenje ili tiranisanje deteta od strane vršnjaka, koje se ponavlja u dužem vremenskom periodu na način i u obimu u kome je detetu koje je žrtva teško da se odbrani. Najčešće je među decom školskog uzrasta. Vršnjačko zlostavljanje događa se kada slabije i povučenije dete biva namerno (i po pravilu ponavljno) povređivano, a da za to nema nikakvog povoda ili razloga (17).

Posledice zlostavljanja

Različiti oblici zloupotrebe i zanemarivanja deteta često su udruženi, a njihove posledice složene. Na primer, fizička zloupotreba je praćena širokim rasponom fizičkog i emocionalnog povređivanja, od najlakšeg do najtežeg. U većini situacija zlostavljnja, fizička ozleda ne predstavlja najtežu ili najdugotrajniju posledicu, već su to posttraumatske akutne reakcije kao i dugotrajno dejstvo na emocionalni razvoj deteta. Potrebno je dobro poznavati uzroke i procese koji dovode do zlostavljanja radi planiranja prevencije, ranog otkrivanja i tretmana tih pojava kroz odgovarajuće institucije, programe, i društvene akcije, kako bi se mogle poduzeti odgovarajuće mere.

Zlostavljanje i zanemarivanje dece u većini slučajeva se događa višekratno, a posledice zavise od uzrasta žrtve. Zlostavljanje u detinjstvu dovodi do negativnog delovanja na: neurološki i intelektualni razvoj, uspeh u školi i životna očekivanja, socio - emocionalni razvoj; socijalne odnose i ponašanje; mentalno zdravlje u celini (18).

Posledice zlostavljanja zavise od vrste zlostavljanja, uzrasta deteta, trajanja i učestalosti zlostavljanja, ličnih karakteristika deteta, reakcije odraslih na obelodanjivanje, postojanja podrške, i trenutka dobijanja psihološke pomoći. One se mogu ispoljiti neposredno po neželjenom incidentu ili dugoročno.

<u>*Neposredne posledice*</u> su pre svega poricanje - otcepljivanje od traumatičnog događaja, što utiče na kasniji razvoj i adaptaciju deteta. Kod takve dece dolazi do osećanje krivice i povlačenje iz kontakata sa okruženjem što ometa dalji intelektualni, emocionalni i socijalni razvoj. Javljaju se napadi besa i povremena agresija - ponašanje kojim se najčešće u vršnjačkoj grupi prevazilazi doživljaj gubitka kontrole i bespomoćnosti, kao i čitav niz mogućih problema u ponašanju, poremećaja navika i razvojnih smetnji.

<u>*Dugoročne posledice*</u> su razvoj posttraumatskog stresnog poremećaja kao i čitav niz mentalnih poremećaja koji se dovode u vezu sa ranim traumatskim doživljajima: depresija, panični poremećaj, poremećaji ishrane, zloupotreba alkohola/narkotika, samopovređivanje, pokušaj suicida, kao i negativne psihološke reakcije - smanjeno samopoštovanje, osećaj gubitka/nedostatka kontrole, teškoće uspostavljanja intimnosti, i kasnije seksualne teškoće i drugi problemi u adolescenciji ili kasnijem životnom dobu.

Nabrojani oblici zlostavljanja i zanemarivanja dece, kao i njihove posledice se često javljaju udruženi i imaju dugotrajno dejstvo na psihički i fizički razvoj deteta. Zato je važno učiniti sve u cilju prevencije zanemarivanja i zlostavljanja, kao i zaštite deteta, kada do zlostavljanja dođe. Saradnja svih institucija i organizacija koje se na

različite načine bave ovim problemom (pravosuđe, policija, socijalna zaštita, zdravstvo, školstvo) i njihova koordinisana akcija u kojoj je na centralnom mestu interes deteta, jedini je način borbe protiv nasilja nad decom i mladima (14).

Prevencija zlostavljanja

Nasilje nad decom ne predstavlja izolovani problem (pojedinačni ili porodični), već problem društva u celini, i kao takvom, treba mu se pristupiti oraganizovano, sistematski, na svim društvenim nivoima.

Činjenica da jos uvek ne postoje adekvatni podaci o obimu i posledicama zlostavljanja i zanemarivanja dece u velikoj meri usporava donošenje odgovarajućih mera prevencije. Na žalost, danas se većina preventivnih mera fokusira na žrtve i počinioce, dok se akcije koje se bave rešavanjem osnove problema stavljaju u drugi plan.

Stvaranje sigurnog i podsticajnog okruženja za decu postiže se kroz primarnu, sekundarnu i tercijarnu prevenciju. Sva tri nivoa prevencije u međusobnoj su interakciji, prožimaju se i dopunjuju, a pojedinačno ih treba posmatrati isključivo kao delove prevencije u celini.

Primarna prevencija

Primarna prevencija podrazumeva rad na prevenciji nasilja u porodici i u društvu. Praktično podrazumeva sve aktivnosti koje će sprečiti pojavu zlostavljanja ili zanemarivanja dece.

Pored opštih mera primarne prevencije koje društvo preduzima (mere usmerene ka opštoj javnosti ili celoj populaciji), a u koje spadaju mere sa ciljem smanjenja siromaštva, edukacija roditelja i zajednice, povećanje dostupnosti i kvaliteta usluga službi koje se staraju o deci, Posebnim protokolom sistema zdravstvene zaštite za zaštitu dece od zlostavljanja i zanemarivanja definisane su i konkretne aktivnosti koje zdravstvena služba može da sprovede u saradnji sa drugim sektorima:

- edukacija javnosti o štetnosti nasilja, o nenasilnoj komunikaciji, o opštem protokolu i posebnim protokolima za zaštitu dece od zlostavljanja, postojećim zakonskim aktima o nasilju u porodici i drugim vrstama nasilja,
- edukacija roditelja o pravima dece, pravilnoj nezi i stimulaciji dečjeg razvoja,
- uspostavljanje saradnje sa relevantnim institucijama u cilju edukacije 18 dece o nenasilnoj komunikaciji, konstruktivnom rešavanju sukoba, samoosnaživanju za prijavljivanje nasilja,
- organizovanje okruglih stolova, foruma i izložbi o zaštiti dece od zlostavljanja,
- jačanje kapaciteta nevladinog sektora i udruženja roditelja u borbi protiv nasilja,
- razvoj preventivnih programa za zaštitu dece od zlostavljanja na nivou zdravstvene ustanove, obrazovno-vaspitnih ustanova i lokalne zajednice,
- spremnost da se deluje u slučaju pojave zlostavljanja (to podrazumeva edukovano osoblje, jasnu podelu uloga i odgovornosti unutar zdravstvene ustanove, definisanu saradnju sa centrom za socijalni rad, policijom, obrazovno-vaspitnim ustanovama i drugim relevantnim institucijama).

Sekundarna prevencija

Sekundarna prevencija obuhvata aktivnosti koje su orijentisane ka otkrivanju i registrovanju dece i porodica kod kojih postoji povećan rizik od pojave zlostavljanja i zanemarivanja i rad sa njima. Najčešće, ove porodice prepoznaju se tokom kućnih poseta patronažnih sestara i redovnih kontrolnih i sistematskih pregleda dece, te upravo na pomenute aktivnosti treba obratiti posebnu pažnju, budući da predstavljuju najznačajniji izvor informacija.

Određene porodice nose znak visokog rizika. Tu spadaju:

- porodice sa problemima nasilja (najčešće ponavljanim problemima nasilja)
- porodice čiji clan (ili članovi) zloupotrebljavaju psihoaktivne supstance
- socijalno ugrožene porodice
- egzistencijalno ugrožene porodice

Najbolji rezultati u radu sa identifikovanim visokorizičnim grupama postižu se tokom kućnih poseta, kroz razgovor i savetovanje.

Tercijarna prevencija

Tercijarna prevencija obuhvata rad sa zlostavljanom i zanemarenom decom i rad sa zlostavljačima (izuzetno je bitan rad, kako sa zlostavljačem, tako i sa nezlostavljajućim roditeljem) kako bi se sprečilo ponovno zlostavljanje i umanjile posledice zlostavljanja i zanemarivanja. Dakle, u tercijarnu prevenciju ubrajaju se aktivnosti koje sprovode zdravstveni radnici i saradnici kada se zlostavljanje ili zanemarivanje vec dogodilo (ili se još uvek događa). Tercijarna prevencija, radi svoje složenost, zahteva učešće, kako zdravstvenih radnika, tako i stručnjaka iz drugih sistema, van zdravstvene zaštite.

Cilj trecijarne zaštite je, ukoliko je to moguće, sačuvati porodicu i sprečiti smeštanje zlostavljane i zanemarene dece u institucije ili u alternativne vidove porodične nege.

Ukoliko, dakle, zlostavljanje i zanemarivanje dece predstavlja, ne pojedinačni, već društveni problem, onda prevencija zlostavljanja i zanemarivanja dece predstavlja društvenu odgovornost.

Neprihvatljivo je čekati da se zlostavljanje dogodi kako bismo, kao društvo, reagovali.

Ono što sistem zdravstvene zaštite čini jedinstvenim jeste prevencija. Kroz prevenciju uslovi odrastanja potencijalno ugrožene dece mogu se poboljšati, formiranjem zdravog okruženja detinjstvo se može učiniti srećnijim, a nesagledive posledice po kvalitet života individue trajno se mogu sprečiti.

Zaključak

Zlostavljanje deteta od strane njemu bliskih osoba koje bi trebalo da mu pružaju neophodnu ljubav i sigurnost, ostavlja nesagledive posledice po njegov psihofizicki razvoj i kasniji zivot. Pored lakših ili veoma teških telesnih povreda koje mogu izazvati ozbiljne deformitete i trajni invaliditet,

izloženost porodičnom nasilju u ranom detinjstvu praćeno je i širokim spektrom neurotskih, prepsihotičkih i psihosomatskih smetnji, kao i otežanim emocionalno-socijalnim funkcionisanjem u odraslom dobu. Evidentan je i rizik da dete izloženo nasilju projektuje ponašanje i stavove agresivnog roditelja i time i samo postane nasilno, ili pak da usvoji ulogu žrtve.

Posledice zlostavljanja na mentalno zdravlje deteta su raznovrsne i različitog su stepena: od kognitivnih problema (intelektualna inhibicija, razvojne disharmonije, problemi sa koncentracijom), preko psiholoških problema u funkcionisanju (depresivnost, strah, strepnja, samodestruktivnost, suicidalnost), do problema u funkcionisanju u odraslom dobu, kao odloženih posledica zlostavljanja i zanemarivanja (granični poremećaj ličnosti, depresija, bolesti zavisnosti).

Problemi socijalnog funkcionisanja ogledaju se u češćem javljanju kriminogenog ponašanja i transgeneracijskom prenošenju obrazaca nasilničkog ponašanja. Brižljiva i stimulativna sredina u prve tri godine života deteta važan je faktor u razvoju mozga dece, pa deca koja su na najranijem uzrastu pretrpela zlostavljanje mogu imati neodgovarajući moždani razvoj i prateće posledice. Praćenje fizički zlostavljane dece pokazalo je da se kod neke dece razvijaju ozbiljne psihičke poteškoće. To je posebno izraženo kod dece koja su izložena hroničnom zlostavljanju, odnosno, kod dece koja odrastaju u porodicama u kojima su pretnje, brojna ili nedosledna pravila ponašanja, surovo i hirovito kažnjavanje, sastavni deo vaspitanja. Traumatizacija u detinjstvu je prediktor za razvoj disocijativnog poremećaja, graničnog poremećaja ličnosti, poremećaja pažnje sa hiperaktivnošću, opozicionalnog poremećaja, poremećaja sa prkošenjem i suprotstavljanjem, anksioznih poremećaja, antisocijalnog poremećaja ličnosti, shizofrenije, psihoza, poremećaja hranjenja, kao i simptoma paranoidnog, narcisoidnog, anti-socijalnog, opsesivno-kompulzivnog, pasivno-agresivnog i depresivnog poremećaja ličnosti.

Vodjenje evidencije o deci koja su izložena bilo kom obliku nasilja je profesionalna, pravna i moralna obaveza zdravstvenih radnika, imajući u vidu činjenicu da zlostavljanje i zanemarivanje ostavlja brojne kratkoročne i dugoročne posledice štetne za razvoj deteta.

Sve aktivnosti u području zlostavljanja i zanemarivanja dece treba da budu usmerena na poboljšanje zaštite dece na svim nivoima, u cilju eliminisanja ili ublažavanja posledica zlostavljanja, počevši od neposrednog rada sa decom, pa do socijalne politike.

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Neophodno je preventivno delovanje u cilju sprečavanja svih oblika nasilja nad decom, kao i multidisciplinami pristup u organizovanju i sprovodjenju zaštite u konkretnim slušajevima zlostavljanja, uz stvaranje uslova za normalan psihofizički i socijalni razvoj deteta. To direktno vodi do smanjenja obima zlostavljanja i zanemarivanja, a time i do poboljšanja mentalnog zdravlja u populaciji.

Literatura:

1. Đuričić Banjanin N. Udarac po duši – sociološka studija zlostavljanja deteta u porodici. Institut za sociološka i kriminološka istraživanja. Beograd: 1998.: 25
2. Milosavljević M. Nasilje nad decom. Fakultet političkih nauka. Beograd: 1998. :21
3. Konvencija Ujedinjenih nacija o pravima deteta. Generalna skupština Ujedinjenih nacija, Njujork, 44. Zasedanje. 20. novembar 1989.
4. Nacionalna strategija za prevenciju i zaštitu dece od nasilja. "Sl. glasnik RS", br. 122/2008
5. Ustava Republike Srbije. "Službeni glasnik RS", broj 98/06
6. Polazni okvir nacionalne strategije protiv nasilja, Ministarstvo rada, zapošljavanja i socijalne politike. Beograd: 2006.
7. Posebni protokol sistema zdravstvene zaštite dece od zlostavljanja i zanemarivanja. Ministarstvo zdravlja, Beograd: 2009.
8. Kempe R.S., Kempe C. H. Child abuse, London: Fontana;1978.
9. Konsultacija o sprečavanju zloupotrebe dece. Svetska zdravstvena organizacija. Ženeva: 1999
10. Opšti protokol za zaštitu dece od zlostavljanja i zanemarivanja. Ministarstvo rada, zapošljavanja i socijalne politike. Beograd: 2005.)
11. Intersektorski pristup zlostavljanju dece. ISPCAN, 2003
12. Commission on Behavioral and Social Sciences and Education, National Research Council. Understanding child abuse and neglect. Panel on Research on Child Abuse and Neglect. Washington, DC: National Academy Press; 1993.
13. Zaštita dece od zlostavljanja i zanemarivanja – primena opšteg protokola" - projekat "Zaštita dece od nasilja u Jugoistočnoj Evropi" – Centar za prava deteta, Beograd: 2011.
14. Priručnika za primenu Posebnog protokola sistema zdravstvene zaštite za zaštitu dece od zlostavljanja i zanemarivanja. Institut za mentalno zdravlje. Beograd: 2012
15. Schreier H. Munchausen by proxy defined. Paediatrics. 2002; 110: 985– 988)
16. Killen, K. Izdani: zlostavljana djeca su odgovornost svih nas. Društvo za psihološku pomoć: Zagreb; Sinapsa: 2001.
17. Program prevencije vršnjačkog zlostavljanja. Za sigurno i poticajno okruženje u školama. Knjižica za roditelje. UNICEF, Zagreb: 2010.
18. Ajduković Marina. Utjecaj zlostavljanja i zanemarivanja u obitelji na psihosocijalni razvoj djece. Dijete i društvo. Zagreb; Godina 3;, Broj 1-2; 2001: 59 -77

PREGLED LITERATURE – REVIEW ARTICLE

How good is early introduction of complementary food?

Rano uvođenje mešovite hrane – da ili ne?

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Summary Timing of first exposure to solid foods for children has been changed over the last 40 years. In the 1970s, there was growing evidence supporting an association between timing of weaning and the increasing prevalence of allergic diseases. Many studies recommended delaying solids after 6 months of age based on the concept that introducing solids too early could play a role in food allergy.
Conversely, through the last years, several studies have investigated whether delay in timing of solid food introduction after 6 months of age could determine food allergy instead of preventing it. Furthermore if an early weaning could have more favorable results than postponing it. This review discusses the current guidelines about the optimal timing of introduction of solids in children.

Key words: allergy, complementary food, child

Sažetak U poslednjih 40 godina, preporuke za uvodjenje solidne hrane u prvoj godini života dece, su promenjene. Sedamdesetih godina prošlog veka, rano uvodjenje mešovite hrane povezano je sa porastom alergijskih bolesti kod dece. Mnogi naučnici su podržali koncept kasniejg uvodjenja solidne hrane, nakon šestog meseca života, sa ciljem prevencije razvoja nutritivne alergije.
Medjutim, poslednjih godina, istraživanja su pokazala suportan koncept, to jest da uvodjenje solidne hrane nakon šestog meseca života, olakšava razvoj nutritivne alergije, umesto da je prevenira, što znači da bi rano uvodjenje mešovite čvrste hrane imalo koristan efekat. Ovaj članak obradjuje aktuelne kliničke vodiče sa temom optimalnog uvodjenja solidne hrane kod dece.

Ključne reči: alergija, ishrana, deca

Introduction

Food allergy and allergic diseases are commonly encountered in many countries, affecting 6-8% of children (1)and there is a great interest in understanding the reasons for the rising prevalence of the allergic disorders (2).

The prevalence of food allergy is highest in infants and toddlers, with 2.5% of infants suffering from cow's milk allergy, while other allergens such as egg, nuts, soya, wheat and fish/shellfish are also common (3).

In the 1970s, there has been a progressive and dramatic delay in timing of first exposure to solid foods for all children until after 6 months of age based on the hypothesis of reducing the prevalence of food allergy. But these recommendations do not appear to have been successful in preventing food allergy (4).

Recently, with advances in allergy research, a more active approach to managing food allergy is being adopted. This approach includes first of all, early dietary introduction of potentially allergenic foods that are tollerate (5).

In fact, with a better understanding of the immune system, it is now clear that delays in timing of introduction of allergenic foods may have actively contributed to the rising prevalence of food allergy in conjunction with other environmental and genetic factors(2).

We reviewed emerging literature and present the current clinical revised guidelines published in the UK and US about timing of introduction (both for high risk infants but also for the general population) aiming to provide a true evidence base in infant feeding process.

OLD recommendations

In the 1970s some studies have been published showing an increased risk for eczema and possibly asthma in babies who were introduced to solid foods very early. First of all, in a 10-year longitudinal study, Ferguson et al. observed that very early exposure (before four months of life) to a varied solid food diet may predispose susceptible children to recurrent or chronic eczema (6).

In a randomized, controlled trial, Zeiger et al. reported that early (before fourth month) combined maternal and

infant allergen avoidance of food antigens significantly reduced the risk of eczema in children of atopic parents (7). Later, a joint statement by the European Society for Paediatric Allergology and Clinical Immunology (ESPACI) Committee on hypoallergenic formulas and by the European Society for Paediatric Gastroenterology, Hepatology and Nutrition Weaning and allergy prevention (ESPGHAN) Committee on nutrition advised postponing the introduction of solid foods to infants beyond six months of age to prevent atopic diseases (8).

Furthermore, a position statement from the AmericanAcademy of Paediatrics (APP) recommended withholding cow's milk until the age of one year, eggs until the age of two years, and peanuts, tree nuts and fish until the age of three years, particularly in high risk children (9).

In 2001, the World Health Organization limited their recommendations and proposed exclusive breastfeeding for the first six months of life and the introduction of solids only thereafter, even in not-at-risk infants (10).

And even a more recent consensus document from the American College of Allergy, Asthma, and Immunology, emphasizing the need for specific practical guidelines for parents and health professionals, suggested that in high-risk infants the introduction of dairy products should be delayed until 12 months of age, eggs until 24 months and peanuts, tree nuts, fish and seafood (fishes and shellfish) until three years of age (11).

New concepts

There have been dramatic changes in evidence for timing of first exposure to solid foods for children over the last years. Different prospective studies have failed to demonstrate an association between early introduction of complementary foods and either eczema or food allergy. Conversely, an increased risk of atopic dermatitis, eczema and allergic sensitisation (with or without symptoms) has been associated with delayed introduction of eggs, milk, cereals and other solids (12,13,14).

In two birth cohort studies, Zutavern et al. found an increased risk of eczema and atopic dermatitis related to the late introduction of eggs, milk, vegetables and meat products. There was a statistically significant increased risk of eczema in relation to the late introduction of these foods (15,16).

Poole et al. analyzing children who were first exposed to cereals after six months of age concluded that they had an increased risk of wheat allergy compared to children who were first exposed to cereals before six months of age (17). Similarly, Nwaru et al. showed that allergic sensitisation to any food allergens was associated with the late introduction of potatoes, oats, rye, meat, fish and eggs (beyond four months of age). Similarly, sensitisation to any inhalant allergens was associated with the late introduction of potatoes, oats, rye, meat and fish (18).

What about peanut? Du Toit et al. demonstrated that despite precise guidelines recommending avoidance of peanuts during infancy, which are strictly applied in the United Kingdom, Australia and North America, peanut allergy continues to increase in these countries; whereas this sensitisation is decreasing among children from Israel. Since the median consumption of peanut products in Israel for infants aged 8-14 months is 7,1 g/month, and 0 g/month in the UK (p < 0,01), it is fascinating to hypothesize that early introduction of peanuts during infancy, rather than strict avoidance, would prevent the development of peanut allergy (19).

Venter et al. showed that peanut sensitisation and reported allergy in children born in 1994-1996 increased from 1989 but seems to have stabilised or slightly decreased since the late 1990s, although not significantly (1).

Amin et al. in a cohort of patients diagnosed with ''food allergy'' from 2003 to 2008 demonstrated that the percentage of peanut allergic children in 2008 was slightly larger than in 2003 but this difference was not statistically significant (20).

Recentely, The Learning Early about Peanut Allergy (LEAP) randomized, open label controlled trial has been published. The authors enrolled 640 children aged 4– 10 months at high risk of peanut allergy (defined as a history of egg allergy or severe eczema), without current peanut allergy (SPT< 4mm on study entry and no history of reaction to peanut) in order to examine the effect of early peanut consumption on peanut allergy Infants were randomized to either regular consumption of peanut protein (2g in three serves per week) or peanut avoidance and the prevalence of peanut allergy in the two groups was assessed and compared at 5 years of age. They concluded that peanut consumption was associated with an 86% reduction in peanut allergy at 60 months of age in SPT negative cohort and 70% in SPT positive cohort. At 60 months, the mean diameter of wheals and peanut specific IgE titers were higher in the peanut avoidance group than in the consumption group. Furthermore, the peanut consumption group showed a significantly greater and earlier increase in levels of peanut specific IgG and IgG4. Early sustained consumption of peanut products was associated with a substantial and significant decrease in the development of peanut allergy in high risk infants (21).

Nowdays: "Work in progress"

Several intervention studies currently in progress could have the potential role to clarify the link between timing of infant feeding and food allergy.

After LEAP study, just published, in UK the EAT study is ongoing to examine the effect of early consumption of a range of potentially allergenic foods on IgE-mediated allergy to any of these foods. The EAT study will involve 2 500 infants with mothers recruited during pregnancy. The intervention arm will introduce six potentially allergenic foods into the infants' diets prior to 6 months of age (cow's milk, egg, wheat, sesame, fish and peanut). The control arm will follow standard UK government advice (exclusive breastfeeding until 6 months of age and no introduction of

allergenic foods – egg, wheat, peanuts, tree nuts, seeds, fish and shellfish - before 6 months of age). The outcomes examined will be IgE-mediated food allergy to the six intervention foods between 1 and 3 years of age (22).

In Germany, the Hen's Egg Allergy Prevention (HEAP) study will involve 800 children, randomized to receive either hen's egg or a placebo at 4–6 months of age, with the effect on egg allergy measured at 12 months of age (23).

There are three important ongoing studies into the prevention of food allergy in Australia: STAR (Solids Timing for Allergy Research), STEP (Starting Time for Egg Proteins) and BEAT (Beating Egg Allergy) studies. They will include about 1900 hight-moderate and intermediate risk with or without eczema randomized to receive egg powder or a placebo (rice powder) from 4 to 6.5 months of age aiming at determining the development of egg allergy or sensitization at 12 months (24).

Early results from the STAR trial indicate that a high proportion of high risk infants with eczema already have sensitization to foods as well as clinical reactivity prior to the introduction of solid foods at 4 to 5 months of age indicating the possible need for interventions prior to the introduction to solid foods to prevent food allergy(25).

Conclusions

There is no convincing scientific evidence that avoidance or delayed introduction of potentially allergenic foods, such as fish and eggs, reduces allergies either in infants considered at increased risk for the development of allergy, or even in those not considered to be at increased risk.

Conversely, there is strong evidence stating that delaying the introduction of certain foods may actually increase (rather than decrease) the prevalence of allergic diseases.

It is important to review current guidelines about timing of solid food introduction in different countries and provide a true evidence base to inform public health practice such as infant feeding guidelines.

References:

1. Venter C, Hasan Arshad S, Grundy J, et al. Time trends in the prevalence of peanut allergy: three cohorts of children from the same geographical location in the UK. Allergy 2010;65:103–8
2. Szajewska H. Early nutritional strategies for preventing allergic disease. Isr Med Assoc J. 2012 Jan;14(1):58-62.
3. Sicherer SH, Sampson H. Food allergy. J Allergy Clin Immunol 2010;125 (Suppl 2): S116–25.
4. Koplin JJ., Allen KJ. Optimal timing for solids introduction – why are the guidelines always changing? Clinical & Experimental Allergy, 43, 826–834.
5. Anagnostou K, Stiefel G, Brough H, du Toit G, Lack G, Fox AT. Active management of food allergy: an emerging concept Arch Dis Child. 2015 Apr;100(4):386-90.
6. Fergusson DM, Horwood LJ, Shannon FT. Early solid food feeding and recurrent childhood eczema: a 10-year longitudinal study. Paediatrics. 1990;86:541-6
7. Zeiger RS, Heller S, Mellon MH, ForsytheAB, O'Connor RD, Hamburger RN, et al. Effect of combined maternal and infant allergen avoidance on development of atopy in early infancy: a randomized study. J Allergy Clin Immunol. 1989;84:72-89.
8. Host A, Koletzko B, Dreborg S, Muraro A, Wahn U, Aggett P, et al. Dietary products used in infants for treatment and prevention of food allergy. Joint Statement of the European Society for Paediatric Allergology and Clinical Immunology (ESPACI) Committee on Hypoallergenic Formulas and the European Society for Paediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN) Committee on Nutrition. Arch Dis Child. 1999;81:80-4.
9. AmericanAcademy of Paediatrics. Committee on Nutrition. Hypoallergenic infant formulas. Paediatrics. 2000;106:346-9
10. The Optimal Duration of exclusive breastfeeding: report of an Expert consultation. Geneva. http://www.who.int/nutrition/publications/optimal duration of exclusive breastfeeding report eng.pdf
11. Fiocchi A, Assa'ad A, Bahna S, Adverse Reactions to Foods Committee; American College of Allergy. Asthma and Immunology Food Allergy and the introduction of solid foods to infants: a consensus document. Ann Allergy Asthma Immunol. 2006;97:10-20.
12. Zutavern A, von Mutius E, Harris J, Mills P, Moffatt S, White C, et al. The introduction of solids in relation to asthma and eczema. Arch Dis Child. 2004;89:303-8.
13. Snijders BE, Thijs C, van Ree R, van den Brandt PA. Age at first introduction of cow milk products and other food products in relation to infant atopic manifestations in the first 2 years of life: the KOALA Birth Cohort Study. Paediatrics. 2008;122:e115-22.
14. Sariachvili M, Droste J, Dom S, Wieringa M, Hagendorens M, Stevens W, et al. Early exposure to solid foods and the development of eczema in children up to 4 years of age. Pediatr Allergy Immunol. 2010;21:74-81.
15. Zutavern A, Brockow I, Schaaf B, von Berg A, Diez U, Borte M, et al., LISA Study Group. Timing of solid food introduction in relation to eczema, asthma, allergic rhinitis, and food and inhalant sensitization at the age of 6 years: results from the prospective birth cohort study LISA. Paediatrics. 2008;121:e44-52.
16. Zutavern A, Brockow I, Schaaf B, Bolte G, von Berg A, Diez U, et al. Timing of solid food introduction in relation to atopic dermatitis and atopic sensitization: results from a prospective birth cohort study. Paediatrics. 2006;117:401-11.
17. Poole JA, Barriga K, Leung DY, Hoffman M, Eisenbarth GS, Rewers M, et al. Timing of initial exposure to cereal grains and the risk of wheat allergy. Paediatrics. 2006;117:2175-82.
18. Nwaru BI, Erkkola M, Ahonen S, Kaila M, Haapala AM, Kronberg- Kippilä C, et al. Age at the introduction of solid foods during the first year and allergic sensitization at age 5 years. Paediatrics. 2010;125:50-9
19. Du toit G, Katz Y, Sasieni P, Mesher D, Maleki SJ, Fisher HR, et al. Early consumption of peanuts in infancy is associated with a low prevalence of peanut allergy. J Allergy Clin Immunol. 2008;122:984-91.
20. Amin JA, Davis MC. Changes in prevalence and characteristics of IgE-mediated food allergies in children referred to a tertiary care center in 2003 and 2008. Allergy Asthma Proc. 2012;33:95-101
21. Du Toit G, Roberts G, Sayre PH, Bahnson HT, Radulovic S, Santos AF, Brough HA, Phippard D, Basting M, Feeney M, Turcanu V, Sever ML, Gomez Lorenzo M, Plaut M, Lack G;

LEAP Study Team. Randomized trial of peanut consumption in infants at risk for peanut allergy. N Engl J Med. 2015 Feb 26;372(9):803-13.
22. Lack G, Perkin M, Flohr C, http://www.eatstudy.co.uk
23. http://www.charite-ppi.de/aktuelles/klinische_studien/huehnereiallergie_praeventionsstudie
24. Fleischer DM, Spergel JM, Assa'ad AH, Pongracic JA. Primary prevention of allergic disease through nutritional interventions. J Allergy Clin Immunol. 2013;1:29–36.
25. Metcalfe J, Prescott SL, Palmer DJ. Randomized controlled trials investigating the role of allergen exposure in food allergy: where are we now? Curr Opin Allergy Clin Immunol.2013;13:296–305

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ORIGINALNI RAD – ORIGINAL ARTICLE

Exhaled Nitric Oxide and Aeroallergen Sensitization in Asthmatic Children

Azot monoksid u izdahnutom vazduhu i alergijska senzibilizacija kod dece sa astmom

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Summary

Introduction: The examination of nitric oxide in exhaled air concentration in children suffering from asthma and to establish the relation with the degree of sensitization to aeroallergens.
Material and Methods: The examination included fifty-two children (aged 12.40 ± 2.35 years), twenty-eight male (53.85%) and twenty-four female (46.15%), with the average length of suffering from asthma 8.33 ± 3.93 years. The degree of sensitization to aeroallergens was determined by skin prick testing and assessed using the atopic index (AI).
Results: The average value of FeNO in exhaled air of children suffering from stable allergic asthma was 43.92 ± 35.63 ppb, and after a four week anti-inflammatory treatment it decreased to 34.92 ± 32.04 ppb ($p<0.05$). In relation to AI, the level of FeNO in exaled air was 41.00 vs. 40.69 vs 50.88 ppb, in the given order without statistically significant difference. The highest values of FeNO in exhaled air were present in children suffering from a mixed type of sensitisation, 56.85 ppb (Me 48.50) in comparison to sensitisation to seasonal allergens 15.29 ppb (Me 12) and indoor allergens 32.22 ppb (Me 26). Allergic rhinitis, the duration of asthma and the gender were not significantly related to the values of FeNO in exhaled breath, while significant was the negative correlation between the body mass index and FeNO, $r = -0,43$ ($p<0.01$).
Conclusion: Children suffering from allergic asthma possess increased values of nitric oxide in exhaled air, which is a useful indicator of daily dosage adjustment in patients treated with anti-inflammatory drugs

Key words: asthma, children, nitric oxide, senzitisation

Sažetak

Uvod: Cilj našeg ispitivanja je bio merenje azot monokisida u izdahnutom vazduhu (FeNO) kod dece sa astmom i korelacija sa stepenom senzibilizacije na aeroalergene.
Metodologija: U ispitivanje je uključeno 52 dece (uzrast od 12.40 ± 2.35 godina), 28 dečaka (53.85%) i 24 devojčica (46.15%). Prosečna dužina trajanja astme je bila 8.33 ± 3.93 godina.Stepen senzibilizacije na aeroalergene odredjivan je kožnim testom i procenjivan atopijskim indeksom (AI).
Rezultati: Prosečna vrednost FeNO kod dece sa stabilnom alergijskom astmom je bio 43.92 ± 35.63 ppb, a nakon 4 nedelje anitinflamatorne terapije, vrednost FeNO se smanjila na 34.92 ± 32.04 ppb ($p<0.05$). U odnosu na AI, vrednosti FeNO su bile 41.00 vs. 40.69 vs 50.88 ppb, bez statisičke značajnosti. Najviša vrednost FeNO izmerena je kod dece sa polisenzibilizacijom, 56.85 ppb (Me 48.50), dok su kod dece senzibilisane samo na sezonske alergene vrednosti FeNO bile 15.29 ppb (Me 12) i kod dece senzibilisane na alergene unutrašnje sredine FeNO vrednosti su bile 32.22 ppb (Me 26). Alergijski rinitis, dužina trajanja astme i pol ispitanika nisu bili značajno povezani sa izmerenim vrednostima FeNO. Značajna negativna korelacija je utvrdjena izmedju indeksa telesne mase (BMI) i FeNO, $r = -0,43$ ($p<0.01$).
Zakljucak: Deca koja boluju od alergijske astme imaju povišene vrednosti FeNO, što je koristan indikator odgovora na antiinflamatornu terapiju

Ključne reči: astma, deca, azot monoksid, senzibilizacija

Introduction

Asthma is a heterogeneous disease, usually characterized by chronic airway inflammation. It is defined by the history of respiratory symptoms such as wheeze, shortness of breath, chest tightness and cough that vary over time and in intensity, together with variable expiratory airflow limitation (1).Many phenotypes have been identified: allergic asthma, non allergic asthma, late-onset asthma, asthma with fixed airflow limitation and asthma with obesity (1). The level of exhaled nitric oxide fraction (FeNO) is elevated in patients with asthma and FeNO may be involved in airway inflammation. Because NO is generated from L-arginine by various cells in the airway including airway and alveolar epithelial cells, vascular endothelial cells, smoth muscle cells, and alveolar macrophages in consequence of

the inflammatory process, the concentration of exhaled NO is proposed to be a non-invasive and facile test or marker to assess eosinophilic airway inflammation in asthma, even in children. Exposure to allergen in sensitized individuals may contribute to airway inflammation. FeNO measurements may provide information on pathological processes, and response to treatment, within the distal lung (2). Studies on children have suggested that levels of FeNO are higher in patients with atopic asthma compared with levels in patients with non-atopic asthma and atopic patients without asthma.The aim of this study was to examin nitric oxide in exhaled air in children suffering from asthma and to establish the relation with the degree of sensitization to aeroallergens.

Material and Methods:

The examination included fifty-two children (aged 12.40 ± 2.35 years), twenty-eight male (53.85%) and twenty-four female (46.15%), with the average duration of asthma 8.33 ± 3.93 years. Inclusion criteria were:children and adolescents with asthma from 7 to 18 years , without signs and symptoms of acute infection one month before the test and the stable phase of the disease. Exclusion criteria were:age less than 7 and more than 18 years, acute exacerbations of asthma, acute viral infection and other chronic diseases: cystic fibrosis, bronchopulmonary dysplasia, primary ciliar dyskinesia.

Pulmonary Function testing

Lung function was measured by baseline spirometry with spirometer Spirovit SP1 (Schiller).

FeNO Measurements

FeNO levels were measured according to the ATS / ERS guidelines by using the NIOX NO monitoring system (Niox mino, Aerocrine AB, Solna, Sweeden) before spirometry tests, so that parameters were within the limits specified by the ATS guidelines. FeNO was measured online with an expiratory flow of 50 ml/s and subjects exhaled against resistance to prevent upper airway contamination.

Allergy Test procedure

Allergic sensitization was determined in all subjects by skin prick tests (SPTs) on common aeroallergens: grass pollen mix, tree pollen mix, wed pollen mix, dust mite mix, house dust mite (*Dermatophagoides pteronyssinus*), cat and dog epithelia, mold mix (Institute for Virusology, Vaccine and Serum, Torlak, Serbia). Histamine and physiological saline were positive and negative controls respectively. A wheal diameter of 3 mm or greater than the negative saline control was considered as a positive result, and sensitization was confirmed. SPT response were converted into an atopic index (0: negative to all aeroallergens, 1: positive to 1-2 aeroallergens, 2: positive to 3-4 aeroallergens, 3: positive to more than 5 aeroallergens).

Statistical Analysis

Data were analyzed using the statistical package for social sciences version 10.0 for Windows (SPSS, Inc., Chicago, IL). Categorical variables are expressed as number of items and percentage. Contiunuous variables are expressed as the mean ± standard deviation (and median). Data were tested for normality (Shapiro Wilk test). Comparison within groups was done using paired t test and Wilcoxon Signed Ranks Test. Comparison between two groups was done using the unpaired t test or Mann-Whitney U test. A p value of <0.05 was considered statistically significant.

Results

Clinical Characteristic of Patients

The total study population consisted of 52 children (28 male, mean age 12,06±2,40 years, and 24 female, mean age 12,79±2,27 years) with intermittent and mild-to-moderate persistent asthma. Among them, 34 (69.38%) also had a diagnose of allergic rhinitis. Mean duration of the diseasewas 8,33 ±3,93years.There were no differences between regarding age, sex, duration of the disease, atopic status and lung function at any time, except for FeNO before and after treatment (Table 1).

Table 1.Clinical characteristics of patients

Parameters	Total
Number of patients (N)	52
Age (years)	12.40±2.35
Duration of the disease (years)	8.33±3,93years
Sex: Male / Female	28 (53.85%) / 24 (46.15%)
Body mass index-percentile	55,31±32.19
Allergic rhinitis	34 (69.38%)
FeNO 1 total (ppb) before treatment	43,92±35,63
FeNO 2 total (ppb) after treatment*	34,92±32,04*
Sex	
Male/	44,43±40,68 vs. 36,25±37,57
Female (FeNO 1 and FeNO 2)	43,33±29,52 vs. 33,38±24,82
Treatment and FeNO (ppb)	
FeNO 1 :Without therapy/ICS	43,70±29,09 ; 95CI 32,84-54,56 ***vs***. 44,23±43,74; 95CI 24,83-63,62
FeNO 2: LTRA/ LTRA+ ICS	33,70±24,58; 95CI 24,52-42,88 ***vs***. 36,59±40,68; 95CI 18,56-54,63
Atopic index N° (%)	
1 / 2 / 3	26 (50.00%) / 16(30,77%) / 10(19.23%)
FEV1 % predict	91.10±13.93

**p<0,05*

Average values of FeNO levels were increased in all subjects. FeNO levels were significantly reduced after the antiinflammatory therapy ($p<0,05$), while no significant difference was obtained in relation to gender. Although the value of FeNO levels decreased after three months of treatment, the difference was not statistically significant.

Table 2.FeNO (ppb) in relation to atopic index

Atopic index -AI	N	%	FeNO1				FeNO2
			X	± SD	Me	X	± SD
Negative - **AI 0**	1	1,85%					
Positive up to 2 allergens- **AI 1**	27	50,00%	41,00	± 29,86	32,00	34,07	± 23,78
Positive up to 4 allergens- **AI 2**	16	29,63%	40,69	± 38,79	30,50	36,88	± 46,29
Positive up to/or more then 5 allergenes- **AI 3**	10	18,52%	50,88	± 42,35	38,00	37,25	± 25,87

** - p<0.01; FeNO1 (before the treatment), FeNO2 (after the treatment)

The levels of FeNO were higher in children with the higher atopic index (polysensitisation).

Table 3.FeNO and indoor allergens (dust mite mix, house dust mite, cat and dog epithelia, mold)

SPTs	N	NO 1			NO 2		
		X	± SD	Me	X	± SD	Me
Indoor allergens +	44	a*46,77	± 34,92	38,00	a*b*38,09	± 33,63	30,50
Indor allergens -	8	28,25	± 37,74	14	17,50	± 11,08	14,00

*a - positive vs negative b ; FeNO2 vs NO1, *- p<0,05*

The levels of FeNO were higher in children witho indoor aeroallergens senzitisation compared with children without senzitisation (p <0.05, Mann-Whitney test).

The level of FeNO were reduced significantly after the antiinflammatory therapy in children sensitized to indoor aeroallergens (p <0.05; Wilcoxon Signed Rank test).

Table 4.FeNO (ppb) and sensitisation on aeroallergens

SPTs	N	FeNO1			FeNO2		
		X	± SD	Me	X	± SD	Me
Negative test	1						
Seasonal allergens +	7	15,29	± 9,66	12,00	18,86	± 11,23	14,00
Perennial allergens +	18	32,22	± 23,30	26,00	23,44	± 13,56	23,00
Mixed type of sensitisation	26	56,85	± 38,35	48,50	48,23	± 39,48	43,00

The value of FeNO were increased in children with the mixed type of sensitization. There was no significant difference in relation to the type of sensitization and first and second FeNO measuring.

Body mass index and FeNO

Median value of BMI-P was 55.31±32.19. The negative correlation between FeNO and BMI-P was statistically significant (r = -0,43; *p<0.01*).

The negative correlation between FeNO and BMI-P after the treatment still remains significant (r= - 0.28; *p<0.05*).

Conclusion

The aim of this study was to examin the values of nitric oxide in exhaled air in children suffering from asthma and to establish the relation with the degree of sensitization to aeroallergens. 52 children were tested, of which 34 had allergic rhinitis in addition to asthma. Only 1 child was non-atopic, while all the rest had positive skin prick tests on aeroallergens and the diagnosis of allergic asthma (intermittent and stable mild persistent asthma). All patients with allergic asthma have elevated levels of NO in exhaled air. No correlation was found between FeNO level and age, gender, weight or BMI. In our study, children senzitised on aeroallergens had elevated levels of FeNO, especially children senzitized on indoor allergens in comparison with the levels of FeNO in children who were not sensitized. The difference was statistically significant. This phenomenon is due to the expectation that children spend more time indoors during the year. Other authors found no difference in the FeNO levels between mono- and polysensitized allergic asthmatic, indicating that the number of allergens had no effect on NO exhalation (3,4). Concentration of RAST values or severity of reaction of the skin prick tests had not been investigated. The highest levels of FeNO were seen in subjects with both atopy and asthma. Scott M at all. found that the FeNO values were positively associated with increased atopic index as evidenced by increased FeNO together with increased skin prick testing positivity, as well as with increased severity of atopic asthma evidenced by the number of attacks of wheezing. FeNO and current inhaled corticosteroid use were not significantly associated. (5) In asthmatic patients, the atopic phenotype is caracterised by significant relationship seen between FeNO and frequency of wheeze. FeNO values in non-atopic asthmatic patients is not significantly related to wheezing frequency, which is an important finding since nearly half of the patients with asthma are non-atopic (6).In our study, only one patient had non-atopic asthma and we were not able to make a comparison of the level of FeNO and atopic or non-atopic asthmatic subjects. This is the biggest disadvantage of our study.

Indicator of asthma severity and the amount of medication the patients receive, did not correlate with the FeNO levels (5). We obtained similar results in our study. Several study have examined the response of FeNO to inhaled corticosteroids (ICS). Willson et al. demonstrated a rapid fall in FeNO after 4 weeks of ciclsonide therapy, followed by an increase following drug washout (7). The ability of FeNO to predict a response to corticosteroid treatment in asthma and other airways disease has been assessed. The most compelling study demonstrated that patients with a high FeNO (>47 ppb at 250 mL·s -1) responded best to ICS, in terms of lung function and improvement in airways hyperresponsiveness. The improvement occurred in patients with a high FeNO and was irrespective of the underlying airways diagnosis (8). Other studies have shown similar results in paediatric populations (9,10). A small study of 26 children examined the FeNO levels change with or without montelukast compared to a control group receiving placebo. FeNO levels decreased when treatment was started, and increased when treatment was discontinued (11). Fritscher et al. found that montelukast added to fluticasone gained a small decrease in alveolar NO, suggesting a change in small airway inflammation (12). Similar results have been described in preschool children (13). In our study, the addition of montelukast to inhaled corticosteroids did not affect significantly the FeNO level.

The main goal of asthma treatment is the prevention of asthma exacerbations, using the lowest dose of corticosteroid. This approach relies on predicting and targeting asthma exacerbations accurately. FeNO is a reasonably good marker of eosinophilic inflammation which

has been shown to predict preventable asthma exacerbations. FeNO is helpful in guiding ICS therapy in patients with asthma. However, in order to replace the peak flow measurements or symptom score management plans, FeNO has two important points: first, normal ranges of FeNO values affected by the age, height and sex need to be established and secondly, the affect of other confounding variables, including atopy, need to be clarified(14).

In conclusion, our results confirmed that children with allergic asthma have increased values of nitric oxide in exhaled air, which is a useful indicator of daily dosage of anti-inflammatory drugs. FeNO has an additional advantage for patient care detecting the eosinophilic airway inflammation, determining the likelihood of corticosteroid responsiveness, monitoring of airway inflammation and unmasking of otherwise unsuspected nonadherence to corticosteroid therapy (15,16).

References

1. Global Strategy for Asthma Management and Prevention. Definition, description and diagnosis of asthma. GINA 2015; 2-11.
2. Shaw DE, Wilson E , Pavord ID. Exhaled nitric oxide in asthma.Eur Respir Mon 2010; 49: 32–44.
3. Silvestri M,Sabatini F, Spallarossa D et al. Exhaled nitric oxide levels in non-allergic and allergic mono- or polysensitised children with asthma. Thorax 2001;56:857-862.
4. Korsch L, Hombach A,Schnegg C and al. Differences in Exhaled Nitric Oxide in Non-and Mono- or Polysensitised Allergic Children with Asthma bronchiale. The Open Pediatr Med J 2008; 2: 30-34.
5. Scott M, Raza A, KarmausW at al. Influence of atopy and asthma on exhaled nitric oxide in an unselected birth cohort study. Thorax 2010;65:258-262. DOI:10.1136/thx.2009.125443
6. Pearce N, Pekkanen J, Beasley R. How much asthma is really attributable to atopy? Thorax 1999;54:268-72.
7. Wilson AM, Duong M, Pratt B, et al. Anti-inflammatory effects of once daily low dose inhaled ciclesonide in mild to moderate asthmatic patients. Allergy 2006; 61: 537–542.
8. Smith AD, Cowan JO, Brassett KP, et al. Exhaled nitric oxide: a predictor of steroid response. Am J Respir Crit Care Med 2005; 172: 453–459.
9. Szefler SJ, Phillips BR, Martinez FD, et al. Characterization of within-subject responses to fluticasone and montelukast in childhood asthma. J Allergy Clin Immunol 2005; 115: 233–242.
10. Zeiger RS, Szefler SJ, Phillips BR, et al. Response profiles to fluticasone and montelukast in mild-to-moderate persistent childhood asthma. J Allergy Clin Immunol 2006; 117: 45–52.
11. Montuschi P, Mondino C, Koch P, et al. Effects of montelukast treatment and withdrawal on fractional exhaled nitric oxide and lung function in children with asthma. Chest 2007; 132: 1876–1881.
12. Fritscher LG, Rodrigues MT, Zamel N, et al. The effect of montelukast on exhaled nitric oxide of alveolar and bronchial origin in inhaled corticosteroid-treated asthma. Respir Med 2009; 103: 296–300.
13. Straub DA, Minocchieri S, Moeller A, et al. The effect of montelukast on exhaled nitric oxide and lung function in asthmatic children 2 to 5 years old. Chest 2005; 127: 509–514.
14. Shaw DE, Wilson E, Pavord ID. Exhaled nitric oxide in asthma. Eur Respir Mono 2010;49: 32-44.
15. Dweik RA, Boggs P, Erzurum SC et al. An Official ATS Clinical Practice Guideline: Interpretation of Exhaled Nitric Oxide Levels (FENO) for Clinical Applications .Am J Respir Crit Care Med 2011;l 184: 602–615. DOI: 10.1164/rccm.912011ST
16. LaForce C, Brooks E ; Herje N et al. Impact of exhaled nitric oxide measurements on treatment decisions in an asthma specialty clinic. Ann Allergy Asthma Immunol 2014; 113: 619-623.

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ORIGINALNI RAD – ORIGINAL ARTICLE

Severity of bronchiolitis associated with atypical pathogens in hospitalized infants in Georgia

Bronhiolitis izazvan atipičnim bakterijama kod hospitalizovane dece

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Summary

Introduction: Bronchiolitis is the most common reason for hospitalization worldwide. Respiratory syncytial virus (RSV), human Metapneumovirus, human Rhinoviruses, human Bocavirus have been shown to predominate. A few studies however have attempted to determine whether other pathogens, particularly Mycoplasma Pneumoniae (Mpn) and Chlamydophila pneumoniae (Cpn), are associated with bronchiolitis in children under 2 years of age. The aim of this study was to determine the prevalence and severity of Mpn and Cpn infection in children under the age of two years presenting to the Iashvili Central Children Hospital in Tbilisi.
Material and Methods: Acute and convalescent serum samples were tested by ELISA for IgM and IgG antibodies to RSV, Cpn and Mpn. 37 children under two years of age were studied. In 19 patients out of 37 (51.35%) etiological diagnosis were established and in 18 patients (48.65%) no pathogens were found. 11 patients (29.72%) had either Cpn or Mpn and 8 patients (21.62%) had RSV.
Results: Children infected with Cpn and Mpn had less severe bronchiolitis than those infected with RSV. There were no statistically significant differences between groups with respect to length of hospital stay.
Conclusion: Our study underlines the importance of atypical bacterial pathogens in acute bronchiolitis in children under two years of age and highlights the complex epidemiology and clinical features of these pathogens in this age group.

Key words: mycoplasma pneumoniae, chlamydophila pneumoniae, respiratory syncytial virus, bronchiolitis, children

Sažetak

Uvod: Bronhiolitis je najčešći uzrok hospitalizacije odojčadi i male dece širom sveta. Respiratory syncytial virus (RSV), humani Metapneumovirus, humani Rhinoviruses, humani Bocavirus smatraju se dominantnim uzročnicima. I drugi uzročnici, naročito Mycoplasma Pneumoniae (Mpn) i Chlamydophilapneumoniae (Cpn), udruženi su sa pojavom bronhiolitisa kod dece mladje od dve godine života. Cilj našeg istraživanja je bio da odredimo učestalost i težinu bronhiolitisa izazvanih Mpn i Cpn kod dece mladje od dve godine života, lečenih u Dečjoj bolnici Iashvili u Tbilisju u Gruzijii.
Metodologija: Akutni i rekovalescentni serum pacijenata testirani su ELISA testom na IgM i IgG antitela na RSV, Cpn and Mpn. 37 –oro dece mladje od dve godine života je ispitivano. Kod 19-oro dece (51.35%) detektovan je uzročnik, dok kod 18-oro pacijenata (48.65%) uzročnik nije utvrdjen. 11-oro pacijenata (29.72%) je imalo infekciju Cpn ili Mpn a osam pacijenata (21.62%) je imalo infekciju RSV.
Rezultati: Deca sa bronhiolitisom izazvanim Cpn i Mpn imali su manje ozbiljne forme bolesti u odnosu na decu kod kojih je izolovan RSV. Koinfekcija nije uticala na težinu bolesti u našoj studiji. Nije bilo statistički značajne razlike izmedju grupa u odnosu na dužinu hospitalizacije.
Zaključak: Rezultati naše studije naglašavaju značaj atipičnih patogenih bakterija za pojavu bronhiolitisa kod dece mladje od dve godine, i ističu kompleksnost epidemioloških i kliničkih karakteristika ovih patogenih uzročnika u grupi dece do dve godine starosti.
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Ključne reči: mycoplasma pneumoniae, chlamydophila pneumoniae, respiratorni sincicijalni virus, bronchiolitis, deca

Introduction

Bronchiolitis is the most common reason for children hospitalization in many countries, challenging both economy, area and staffing in paediatric departments (1, 2).

The causes of bronchiolitis have been studied in different environments and populations. In most studies *Respiratory syncytial virus (RSV), human Metapneumovirus,*

human Rhinoviruses, human Bocavirus have consistently been shown to predominate.

A few studies, however, have attempted to determine whether other, particularly atypical pathogens *Mycoplasma Pneumoniae (Mpn)*and *Chlamydophilapneumoniae (Cpn),* which are frequently detected in older children and adults with asthma exacerbation, are associated with bronchiolitis in children under 2 years of age (3,4,5).

Objectives

The aim of this study was to determine the prevalence and severity of atypical pathogens in children under the age of 2 years presenting to the Iashvili Central Children Hospital.

Materials and Methods

Acute and convalescent serum samples were tested by ELISA for IgM and IgG antibodies to *RSV, Cpn and Mpn.* Positive results were defined by a significant antibody response in specific IgM or a 4-fold increase in IgG titer in paired serum samples.

	0	1	2
Respiratory rate	normal < 40/min	slightly increased 40 - 60/min	clearly increased > 60/min
Oxygen saturation	≥ 95% in room air	92-94% in room air	< 92% in room air, or need for supplemental oxygen
Wheezing	none	audible with stethoscope	audible without stethoscope
Retractions	none	mild-moderate	severe
General condition	not affected: alert/quietly sleeping	moderately affected: Irritable or agitated	severely affected: lethargic, poor feeding

Table 1.Dyspnea Score

Children included in the study were divided into age groups of 0-6 months, 7-11 months, and 12-24 months.

Daily dyspnea score (Table 1) was assessed in all patients by using symptom score on a scale from 0 to 10 based on a clinical scoring system according to Kristj'ansson et al. (6).Children with dyspnea score from 0 to 3 were considered as a mild bronchiolitis, with score 4-6 as a moderate and with score 7-10 as a severe bronchiolitis.

The results have been analyzed by the SPSS Statistics versions 16.0. $p<0.05$ has been considered as significant difference.

Results

Thirty sevenchildren under two years of age were studied. Their median (range) age was 11.86 month (age distribution from 3 to 23 months).Etiological diagnosis was established in 19 patients out of 37 (51.35%).Patients were grouped according to pathogens in three groups: in the group I were included 11 patients with *Cpn* and *Mpn;* in the group II - 8 patients with *RSV*; in the group III – 7 patients with mixed-infections with *Cpn, Mpn* and *RSV.*

There was no significant difference in age between infants presenting with bronchiolitis associated with different pathogens.

Overall, 57.9% (n = 11) of children had milddisease, 31.6% (n=6) moderate disease and 10.5% (n=2) severe disease. Children with RSV were more likely to have *moderate* and severe than mild disease (62.5% vs.27.3%, $p<0.05$) compared to children without RSV infection, whilst children with *Cpn* and *Mpn* infection were more likely to have mildthan moderate disease (72.7% vs. 37.3%, $p = 0.05$).

Infants with RSV had higher bronchiolitis severity scores with a median of 4.89 vs. infants with atypical pathogens (median 3.37, $p<0.05$) and vs. infants with mixed-infections (median 3.57, $p<0.05$).

Conclusion

Our results showed that children infected with *Cpn* and *Mpn* had less severe bronchiolitis than those infected with *RSV*. Co-infection was not associated with the disease severity.

References

1. Nair H, Nokes DJ, Gessner BD. Global burden of acute lower respiratory infections due to respiratory syncytial virus in young children: a systematic review and meta-analysis. Lancet 2010; 375: 1545-55.
2. Qumar K, Skjerven HO, Mikalsen IB. Mikalsen IB. Acute bronchiolitis in infants, a review. Scand J Trauma Resusc Emerg Med. 2014 Apr 3; 22-23.

3. Ji W,Chen ZR,Zhou WF, Sun HM,Li BQ,Cai LH, et al. Etiology of acute respiratory tract infection in hospitalizedchildrenin Suzhou from 2005 to 2011.Zhonghua Yu Fang Yi Xue Za Zhi. 2013; Jun;47 (6):497-503.
4. Miller KE, Gebretsadik T, Carroll KN, Dupont WD, Mohamed YA, Morin LL, et al. Viral Etiologies of infant bronchiolitis, croup, and upper respiratory illness during four consecutive years. Pediatr Infect Dis J. 2013; Sep; 32(9): 950-5.
5. Kristj'ansson S, Loudrup C, Wennergren G, Strannegard I-L, Carlsen K-H.Nebulised racemic adrenaline in the treatment of acute bronchiolitis in infants and toddlers. Archives of Disease in Childhood 1993; Dec; 69 (6): 650-4.

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ORIGINALNI RAD – ORIGINAL ARTICLE

Podrška porodici u prevenciji pušenja adolescenata

Family support and prevention of smoking adolescents

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Sažetak

Uvod: Pušenje predstavlja jedan od najznačajnijih faktora narušavanja zdravlja ljudi u svetu i ima brojne zdravstvene, socijalne, ekonomske i ekološke posledice. Razvojni stadijum adolescencije smatra se fazom najvećeg rizika za započinjanje pušenja. Razumevanje specifičnosti socijalnog konteksta u kome dolazi do pojave pušenja mladih, veoma je važno za kreiranje politike kontrole pušenja i programa prevencije.

Metodologija: Istraživanje je sprovedeno tokom školske 2010/2011. godine u šest osnovnih škola, sa područja grada Beograda. Uzorak je činilo 515 učenika osmog razreda, oba pola. Za prikupljanje podataka upotrebljen je Upitnik o pušenju mladih.

Rezultati: Rezultati ovog istraživanja potvrđuju da postoji povezanost između ponašanja članova porodice u vezi sa pušenjem i pušenja adolescenata: statistički značajno veća učestalost probanja cigareta ($\chi2 = 20,23$; df = 2; $p < 0,001$) i trenutnog pušenja ($\chi2 = 6,36$; df = 2; $p < 0,05$) otkrivena je kod adolescenata u čijim kućama je pušenje dozvoljeno; učestalost probanja cigareta je statistički značajno veća kod ispitanika koji žive sa nekim ko puši ($\chi2 = 6,65$; df = 1; $p < 0,01$).

Zaključak: Glavni zaključak ovog istraživanja je da porodica utiče na pojavu pušenja kod adolescena

Ključne reči: prevencija, pušenje, adolescenti, porodica

Summary

Introduction: Smoking is one of the most important factors compromising the health of people all around the world carrying with it numerous health, social, economic and environmental consequences. Developmental stage of adolescence carries with it the greatest risk for smoking initiation. Understanding the specific social context in which it comes to the is crucial for creating prevention programs and policies that control tobacco.

Material and Merthods: The survey was conducted during the school year 2010/2011 in six elementary schools from Belgrade area. The sample consisted of 515 eighth grade students of both sexes. For data collection *Youth Tobacco Survey – YTS* was used.

Results: The results of this study confirm that there is a correlation between the behavior of family members in relation to smoking and smoking adolescents: a statistically significantly higher incidence of tasting cigarettes ($\chi2 = 20.23$; df = 2; $p < 0.001$) and current smoking ($\chi2 = 6.36$; df = 2; $p < 0.05$) were found among adolescents whose houses smoking is permitted; frequency of tasting cigarettes was significantly higher among participants who live with someone who smokes ($\chi2 = 6.65$; df = 1; $p < 0.01$).

Conclusion:Familu andfamily relationships are major influenting factor regarding smoking in adolescents.

Key words: prevention, smoking, adolescents, family

Uvod

Stručnjaci širom sveta ukazuju na činjenicu o postojanju svetske epidemije upotrebe duvana sa jasnim naučnim dokazima da duvanski proizvodi sadrže farmakološki toksične, mutagene i kancerogene komponente. Pušenje cigareta, kao i izloženost duvanskom dimu, predstavljaju značajan faktor narušavanja zdravlja ljudi i uzrok su niza bolesti koje znatno smanjuju kvalitet života i dovode do prevremenog umiranja. Prema izveštajima Svetske zdravstvene organizacije, u svetu puši više od 1 milijarde ljudi, a pušenje svake godine odnese oko 5,4 miliona života (1).

Rezultati Globalnog istraživanja upotrebe duvana kod mladih u svetu pokazuju da 17,3% učenika, uzrasta od 13 do 15 godina, trenutno koristi neki duvanski proizvod, a cigarete 8,9% i to najviše u Evropi i Americi, a najmanje u Jugoistočnoj Aziji i Istočnom Mediteranu (2). Adolescencija je kritičan uzrast za započinjanje sa pušenjem. Smatra se da bi efikasni programi prevencije pušenja među mladima mogli, u znatnoj meri, da smanje broj smrtnih ishoda u odraslom dobu izazvanih bolestima prouzrokovanim pušenjem.

Procene uticaja na ponašanje adolescenata razlikuju se od istraživanja do istraživanja zbog primene različitih metodoloških postupaka, instrumenata i uzorka. Podaci jasno ilustruju da je pušenje prihvaćeno kao normalan oblik ponašanja u Republici Srbiji, na šta ukazuje visok procenat mladih koji žive u porodici sa pušačima, kao i velika izloženost mladih reklamnim kampanjama duvanske industrije(3). Cilj ovog istraživanja je da se utvrdi povezanost ponašanja članova porodice u vezi sa pušenjem i pušenja adolescenata.

U skladu sa navedenim ciljem istraživanja, postavljen je sledeći zadatak-procena ponašanja članova porodice u vezi sa pušenjem.Na osnovu postavljenog istraživačkog cilja, formulisana je sledeća hipoteza:1 Postoji povezanost između ponašanja članova porodice u vezi sa pušenjem i pušenja adolescenata.Na osnovu dobijenih rezultata, u završnom delu rada su date preporuke za unapređenje prakse prevencije i redukovanja pušenja kod adolescenata.

Metodologija

Uzorak čini 515 učenika osmog razreda, oba pola, od čega je 285 (55,3%) dečaka i 230 (44,7%) devojčica. Uzrast ispitanika iz uzorka je od 13 do 15 i više godina.Podaci su prikupljeni anketiranjem učenika na času.

Za prikupljanje podataka upotrebljen je instrument pod nazivom Upitnik o pušenju mladih (Youth Tobacco Survey (YTS) 2006 Questionnaire, Centers for Disease Control and Prevention – CDC, 2006).Podaci su obrađeni primenom programa SPSS (Statistical Package for Social Sciences) verzija 10.01. U obradi rezultata ispitanika korišćene su metode deskriptivne statistike i hi-kvadrat test

Rezultati

Povezanost ponašanja članova porodice sa pušenjem ispitanika

Na pojavu pušenja mladih značajno utiče pušenje članova porodice i stavovi roditelja prema pušenju. (4) U periodu adolescencije se često usvajaju pogrešni obrasci ponašanja, koji se kasnije prenose i u odraslo doba.

U Tabeli 1 prikazani su odgovori o pravilima o pušenju kod kuće ispitanika koji su probali cigarete i onih koji nisu.

Od ukupnog broja ispitanika koji su probali da puše cigarete 23,6% je izjavilo da u njihovoj kući pušenje nikada nije dozvoljeno, 30,3% navodi da je pušenje dozvoljeno samo u neko vreme ili na nekom mestu i 46,1% da je pušenje uvek dozvoljeno.

Među ispitanicima koji nisu probali cigarete, 39,4% navodi da u njihovoj kući pušenje nije dozvoljeno, 34% da je pušenje ponekad dozvoljeno i 26,6% da je pušenje u njihovoj kući dozvoljeno. Razlike su statistički značajne ($\chi 2 = 20,23$; $df = 2$; $p < 0,001$).

Koja od ovih rečenica najbolje opisuje pravila o pušenju koja važe kod tvoje kuće?	Da li si probao/-la da pušiš cigarete, makar 1-2 dima?			
	Da		Ne	
	Br.	%	Br.	%
Pušenje nikada nije dozvoljeno u mojoj kući	39	23,6	138	39,4
Pušenje je dozvoljeno samo u neko vreme ili na nekom mestu	50	30,3	119	34,0
Pušenje je uvek dozvoljeno u mojoj kući	76	46,1	93	26,6

Tabela 1.Distribucija učestalosti probanja cigareta prema odgovoru na pitanje „Koja od ovih rečenica najbolje opisuje pravila o pušenju koja važe kod tvoje kuće?“

Table 1.Distribution of smoking tendencies based on the following question “Which of these sentences best describes the rules regarding smoking in your household?“

Prema podacima u Tabeli 2, od ukupnog broja ispitanika koji trenutno puše, 20,4% navodi da je njihovoj kući pušenje nije dozvoljeno, 32,7% da je ponekad dozvoljeno i 46,9% da je uvek dozvoljeno. Od ispitanika nepušača, 35,8% je izjavilo da je pušenje u njihovoj kući zabranjeno, 32,8% da je ponekad dozvoljeno i 31,3% da je uvek dozvoljeno. Razlike između grupa su statistički značajne ($\chi 2 = 6,36$; $df = 2$; $p < 0,05$).

Rezultati dobijeni u ovom istraživanju pokazuju da postoji statistički značajna veza između pušenja adolescenata i pravila o pušenju kod kuće, tako da je učestalost probanja cigareta i trenutnog pušenja veća kada je u kući dozvoljeno pušenje.

Koja od ovih rečenica najbolje opisuje pravila o pušenju koja važe kod tvoje kuće?	Da li si pušio/-la tokom proteklih 30 dana?			
	Da		Ne	
	Br.	%	Br.	%
Pušenje nikada nije dozvoljeno u mojoj kući	10	20,4	167	35,8
Pušenje je dozvoljeno samo u neko vreme ili na nekom mestu	16	32,7	153	32,8
Pušenje je uvek dozvoljeno u mojoj kući	23	46,9	146	31,3

Tabela 2.Distribucija učestalosti trenutnog pušenja prema odgovoru na pitanje „Koja od ovih rečenica najbolje opisuje pravila o pušenju koja važe kod tvoje kuće?“

Table 2.Current smoking patterns distribution based on the answers on the following question „Which of these sentences best describes rules regarding smoking in your household?“

I drugi autori su ustanovili da adolescenti koji puše u većem broju slučajeva izjavljuju da je pušenje dozvoljeno kod njihove kuće. Newman i Ward (5) nalaze da je neodobravanje pušenja od strane roditelja povezano sa manjom učestalošću pušenja adolescenata. Prema ovim autorima, ukoliko roditelji imaju jasno izražen stav koji ne

odobrava upotrebu cigareta, učestalost pušenja kod adolescenata je manja, bez obzira na to da li roditelji puše ili ne.

Međutim, oni ističu da roditelji pušači ređe zabranjuju deci da puše, jer smatraju to licemernim.

Sa druge strane, Harakeh i saradnici (6) nisu našli statistički značajnu vezu između pušenja adolescenata i pravila o pušenju kod kuće, mada su roditelji nepušači postavljali jasnija i stroža pravila u pogledu pušenja kod kuće. Pokazalo se da na pušenje adolescenata značajnije utiče kvalitet komunikacije sa roditeljima.

Prema podacima prikazanim u Tabeli 3, od ukupnog broja ispitanika koji su probali cigarete, 71,5% živi sa ukućanima koji puše, dok 28,5% živi sa nepušačima.

Da li neko ko živi sa tobom puši?	Da li si probao/-la da pušiš cigarete, makar 1-2 dima?			
	Da		Ne	
	Br.	%	Br.	%
Da	118	71,5	206	58,9
Ne	47	28,5	144	41,1

Tabela 3.Distribucija učestalosti probanja cigareta prema odgovoru na pitanje „Da li neko ko živi sa tobom puši?“
Table 3.Distribution of trying cigarettes based on the following question „Does someone living with you smokes?“

Sa druge strane, među ispitanicima koji nisu probali da puše, 58,9% živi sa pušačima i 41,1% sa nepušačima. Razlike su statistički značajne ($\chi 2 = 6,65$; $df = 1$; $p < 0,01$).

Na osnovu podataka dobijenih u našem istraživanju možemo zaključiti da je učestalost probanja cigareta veća kod onih adolescenata koji žive sa nekim ko puši.

Međutim, nisu otkrivene značajne razlike u trenutnom i svakodnevnom pušenju adolescenata u zavisnosti od pušenja članova njihovih porodica, pa ove rezultate treba interpretirati sa oprezom.

Studija koju su sproveli Griesbach i sardnici (7) pokazala je da upotreba cigareta među adolescentima povezana sa pušenjem roditelja. Učestalost svakodnevnog pušenja je veća kod adolescenata koji žive sa jednim ili oba roditelja koji puše, u odnosu na adolescente koji dolaze iz nepušačkih porodica. Takođe, ovi autori nalaze da na učestalost pušenja adolescenata utiče i pušenje drugih članova porodice (braća i sestre, očuh, maćeha, polubraća i polusestre).

U istraživanju koje su sproveli Harakeh i saradnici (6) nije otkrivena direktna povezanost pušenja roditelja i pušenja adolescenata. Međutim, navedeni autori smatraju da je pušenje roditelja povezano sa nizom faktora koji mogu doprineti pušenju adolescenata, kao što su: dostupnost cigareta, nejasna pravila o pušenju kod kuće, nekonstruktivno reagovanje na eksperimentisanje deteta sa cigaretama i slično.

Pregled 87 studija, koje su analizirali Avenevoli i Merikangas (8), pokazuje da je uticaj roditelja na pojavu pušenja kod adolescenta relativno skroman. I kada je utvrđeno da je taj uticaj značajan, reč je o malim vrednostima u odnosu na druge faktore rizika. Efekti roditeljskog pušenja na pojavu pušenja kod adolescenata zavise od velikog broja različitih faktora, uključujući individualne karakteristike adolescenta i roditelja, genetske predispozicije, razvojni nivo adolescenata, prenatalnu izloženost nikotinu i nespecifične karakteristike roditelja i porodične sredine. Takođe, ovi autori smatraju da navedeni faktori deluju u interakciji, te se pojava pušenja u adolescenciji ne može prepisati samo pušenju roditelja, već navode da drugi porodični faktori, poput specifičnih vrsta roditeljstva, uticaja roditelja na adolescentova uverenja u vezi sa zdravljem, nepotpune porodične strukture, nesloge, izloženosti stresu i sl., ostvaruju veći uticaj na pojavu pušenja u periodu adolescencije.

Zaključak

Mladi, njihovo zdravlje i zdravstveno ponašanje okupiraju značajnu pažnju stručnjaka različitih profila. Rezultati ovog istraživanja potvrđuju da postoji povezanost između ponašanja članova porodice u vezi sa pušenjem i pušenja adolescenata. Zapaženo je da su ispitanici koji svakodnevno puše češće razgovarali sa roditeljima o štetnosti pušenja, ali statistička značajnost ovih razlika nije potvrđena. Na osnovu dobijenih rezultata izvedeno je i nekoliko stručnih zaključaka koji su realni, dovoljno jasni i optimistički orjentisani i koji će, bar malo proširiti naše znanje o upotrebi duvana i pomoći mladima i njihovim porodicama da saznaju, odluče i spreče razvoj progresije pušenja, od eksperimenta i radoznalosti, do učestale upotrebe i zavisnosti.

Problemi pušenja adolescenata duboko su uslovljeni socijalnim, ekonomskim i kulturnim osobenostima sredine u kojoj žive. Rizik pušenja je veći ukoliko mladi žive u domaćinstvu u kome se puši. Popuštanje porodičnih pravila i slabljenje nadzora nad decom u procesu odrastanja može dovesti do problematičnog ponašanja adolescenata. Pasivno pušenje predstavlja takođe rizik po zdravlje adolescenata. Pored savetovanja roditelja o prekidanju pušenja u prisustvu dece i ostavljanju cigareta, treba primeniti i grupne tematske programe organizovane za decu i roditelje, kako bi se umanjila verovatnoća da deca postanu pušači i eliminisala njihova izloženost duvanskom dimu. Edukativne, zdravstveno-promotivne, preventivne, zaštitne i druge mere značajno utiču na formiranje zdravstvenog potencijala mladih.To je osnova za stvaranje novih generacija koje će vlastito potomstvo usmeravati na zdrave stilove života.

Literatura

1. World Health Organisation (WHO) (2015). Media centre - Tobacco. Dostupno 10. februara 2015. godine na http://www.who.int/mediacentre/factsheets/fs339/en/

2. Krstev S, Marinković J, Simić S, Kocev N, Bondy S. J. Prevalence and predictors of smoking and quitting during pregnancy in Serbia: results of a nationally representative survey. International Journal of Public Health 2012; *57*(6), 875-883.
3. World Health Organisation (WHO) (2013). WHO Report on the Global Tobacco Epidemic - Country profile: Serbia. Dostupno 10. februara 2015. godine nahttp://www.who.int/tobacco/surveillance/policy/country_profile/srb.pdf?ua=1
4. Chassin L, Presson C.C, Montello D, Sherman S. J., McGrew J. Changes in Peer and Parent Influence During Adolescence: Longitudinal Versus Cross-Sectional Perspectives on Smoking Initiation. Developmental Psychology, 1986; *22*(3), 327-334.
5. Newman ., Ward J. M. The influence of parental attitude and behavior on early adolescent cigarette smoking. Journal of School Health,1986; 59(4), 150–152.
6. Harakeh Z, Scholte RHJ, de Vries H, Engels RCME. Parental rules and communication: their association with adolescent smoking. Addiction, 2005;100, 862–870.
7. Griesbach D, Amos A, Currie C. Adolescent smoking and family structure in Europe. Social Science Medicine, 2003; 56, 41–52.
8. Avenevoli S, Merikangas KR. Familial influences on adolescent smoking. Addiction, 2003; 98(1), 1–20.

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ORIGINALNI RAD – ORIGINAL ARTICLE

Uticaj i značaj respiratorne rehabilitacije na lečenje i prevenciju dečje astme

Influence and Importance of Respiratory Rehabilitation in Children with Asthma

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Sažetak

Uvod: Astma je jedna od najčešćih hroničnih respiratornih bolesti u detinjstvu. Glavni cilj u lečenju pacijenata nije samo u poboljšanju kvaliteta života, već takođe i u smanjenju rizika od narednih egzacerbacija. Cilj ove studije bio je da ustanovi da li paralelno primenjena respiratorna rehabilitacija sa medikamentnim tretmanom ima za rezultat bolju kontrolu astme bez egzacerbacija bolesti.
Metode: Ispitivano je ukupno 180 pacijenata (100 dečaka i 80 devojčica), podeljenih u tri grupe u odnosu na primenjenu terapiju: I grupa su bili pacijenti koji su lečeni samo medikamentnom terapijom, II grupa su bili pacijenti koji su lečeni samo procedurama respiratorne rehabilitacije i III grupa su bili pacijenti koji su podvrgnuti i medikamentnom lečenju i respiratornoj rehabilitaciji istovremeno. Svaka grupa je podeljena u dve podgrupe oni koji su bili na prevenciji i oni koji to nisu.
Rezultati: Analizom rezultata dobijenih u studiji pokazali smo da su bolesnici lečeni medikamentnom terapijom i istovremeno respiratornim rehabilitacionim procedurama imali statistički značajno veće poboljšanje ($p<0,05$) u odnosu na one koji su lečeni samo medikamentnom terapijom, odnosno statistički značajno veće poboljšanje ($p<0,001$) u odnosu na one koji su tretirani samo respiratornim rehabilitacionim procedurama. Bolesnici koji su imali preventivnu terapiju postigli su značajnost u poboljšanju u toku ove dvojne istovremene terapije ($p<0,05$).
Zaključak: Za dobru kontrolu astme neophodna je dobra opservacija i kombinovani tretman: medikamentna i preventivna terapija uz primenu respiratornih rehabilitacionih procedura.

Ključne reči: astma, respiratorna rehabilitacija, deca.

Summary

Introduction: Asthma is one of the most common chronic pulmonary diseases of childhood. The goal benefits patients not only in regard to improving quality of life, but also in reducing the risk of future exacerbations. Pulmonary rehabilitation has become a standard of care for children with asthma. The aim of this study was to establish if drugs and respiratory rehabilitation applied at the same time lead to better control asthma and had no exacerbation.
Material and Methods: A total of 180 patients (100 boys and 80 girls) devided in to three groups according to the treatment: I first one with those treated only with medical treatment, II second one with those treated only with respiratory rehabilitation treatment and third one with those treated both with medical treatment and respiratory rehabilitation. Each group had two subgroups of patients - first one with those had preventive therapy and second one with those had not.
Results:The data showed that almost all of the patients who were treated with the combination of medical treatment and paralel with respiratory rehabilitation procedures had significantly higher increase of amelioration ($p<0,05$) in comparison with patients who were treated just with medical treatment and ($p<0,001$) in comparison with patients who were treated just with respiratory rehabilitation procedures, and especially we were obtained better results in patients with preventive therapy ($p<0,05$).
Conclusion: Asthma control needs long opservation and combined treatment: medical and preventive therapy and the respiratory rehabilitation like hinge for shorter and easier course of disease. Combination medicament treatment and respiratory rehabilitation procedures leads in statistically higher improvement and reduces the risk of future exacerbations.

Key words: asthma, respiratory rehabilitation, children

Uvod

Porast učestalosti alergijskih bolesti predstavlja važan izazov i problem za zdravstveni sistem i društvo u celini.(1) Astma je multifaktorijalna bolest i na njenu ekspresiju utiču faktori rizika pacijenta (genska predispozicija, razvoj pluća, hiperresponsivnost disajnih puteva, pol) i faktori rizika spoljašnje sredine (aerozagađenje, nepovoljni uslovi stanovanja-vlaga, d.dim, alergeni spoljašnje i unutrašnje sredine, ishrana majke u trudnoći (1, 2). Astma kao kompleksna bolest utiče na kvalitet života dece i njihovih porodica (3). Razvoj astme počinje u najranijem uzrastu i perzistira i u odraslom dobu (4). Dokazano je da najčešće obolevaju deca u predškolskom uzrastu, više nego druge uzrastne grupe (4, 5). Zapaženo je da nije dovoljna samo

kauzalna terapija u astmi već je neophodno imati strogo individualni pristup u pogledu dijagnostike, tretmana, praćenja, ali i u pogledu preventivne terapije (6). U suštini, visoka prevalenca astme je veliki problem, ali je i raznolikost fenotipova bolesti i shodno tome i potreba pacijenata bitna i mora se uzeti u obzir radi što uspešnijeg lečenja (7). Astma je najčešća hronična, imunološki uslovljena, bolest kod dece, a manifestuje se promenljivom i periodičnom opstrukcijom disajnih puteva i hipersekrecijom (8). Terapija astme je u prvom redu medikamentna – bronhodilatatori (beta2 agonisti, antiholinergici), kortikosteroidi, antiinflamatorni lekovi, teofilini (9). Međutim, ne retko je neophodno dodati i nefarmakološke tretmane za potpunije lečenje. Najčešći oblik nefarmakološkog lečenja je respiratorna rehabilitacija koja ima za cilj poboljšanje plućne funkcije, smanjenje simptoma bolesti, kao i njihovu učestalost i poboljšanje fizičke kondicije pacijenata (9). Respiratorna rehabilitacija je podacima potvrđena, multidisciplinarna i lako prihvatljiva intervencija za pacijente sa hroničnim respiratornim bolestima. Integrisana u idividualni tretman pacijenata respiratorna rehabilitacija je osmišljena da redukuje simptome, poboljša funkcionalni status, poveća učešće pacijenata u svakodnevnom životu i da redukuje posete lekaru stabilizacijom bolesti (10).

Sveobuhvatni program respiratorne rehabilitacije pored optimalne medikamentne terapije podrazumeva: edukaciju, kontrolu bolesti i poboljšanje kvaliteta života, fizikalnu terapiju i vežbanje i psihosocijalnu i nutritivnu podršku (11).

Metodologija

Ispitivanje je obavljeno u Specijalnoj Bolnici „Sokobanja“ u Sokobanji 2011.godine. Praćena su deca u toku boravka u bolnici, a i kasnije na redovnim kontrolama u ambulanti. Sva deca su imala hospitalni tretman 21 dan, a podeljeni su u tri grupe sa po 6o-oro dece; prva grupa su deca koja su lečena samo medikamentnom terapijom, druga grupa su deca koja su imala samo fizikalne procedure u sklopu respiratorne rehabilitacije i treća grupa su deca koja su paralelno lečena medikamentnom terapijom i respiratorno-rehabilitacionim procedurama. U svakoj grupi bile su dve podgrupe: sa i bez profilaktičke terapije. Respiratorna rehabilitacija obuhvatila je dve grupe tehnika: ***plućnu fizikalnu terapiju i disajni trening i fizičko vežbanje.*** Plućna fizikalna terapija je sadržala sledeće manevre: podsticanje kašlja-kontrolisan kašalj, položajnu drenažu bronhijalnog stabla, perkusiju i vibraciju grudnog koša. Disajni trening i fizičko vežbanje su tehnike predviđene da poboljšaju funkciju respiratornih i perifernih mišića i olakšaju dispneju. Za procenu respiratorne rehabilitacije na stanje pacijenata praćen je fizikalni nalaz, u toku hospitalizacije, postojanje ili odsustvo dispnoje, tolerancija fizičkog napora i pojava egzacerbacija nakon odlaska kući. U statističkoj obradi korišćen je X^2 test.

Rezultati

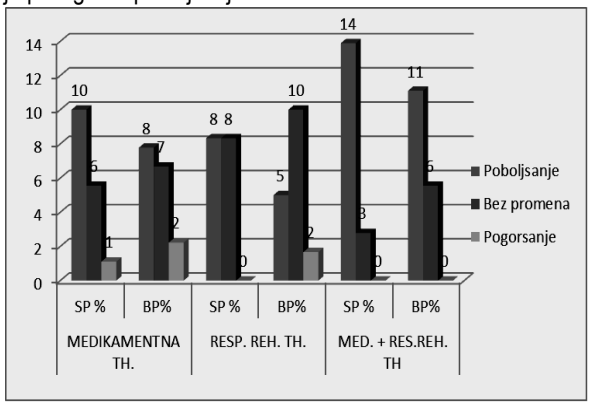
Analizirano je 180 bolesnika-dece uzrasta od sedam do četrnaest godina, bilo je 100 dečaka i 80 devojčica, bez statističke značajnosti u razlici po polu. Praćen je klinički nalaz svakodnevno(da li postoji promena u odnosu na prvi dan hospitalizacije), da li se održava dispneja ili se de novo javlja u toku hospitalizacije, kolika je tolerancija na napor, u odnosu na prvi dan hospitalizacije, da li je došlo do pojave egzacerbacije u toku hospitalizacije ili po izlasku iz bolnice u toku narednih godinu dana.

	Medikamentna terapija		Respiratorna rehabilitacija		Medikamentna i terapija + rehabilitacija		UKUPNO	UKUPNO SP I BP	
	SP/ %	*BP/%*	*SP/%*	*BP/%*	*SP/%*	*BP/%*	*%*	*SP /%*	*BP /%*
Poboljšanje	18 (10)	14 (8)	15 (8)	9 (5)	25 (14)	20 (11)	101 (56)	58 (32)	43 (24)
Bez promena	10 (6)	12 (7)	15 (8)	18 (10)	5 (3)	10 (6)	70 (39)	30 (17)	40 (22)
Pogoršanje	2 (1)	4 (2)	0 (0)	3 (2)	0 (0)	0 (0)	9 (5)	2 (1)	7 (4)
UKUPNO	30	30	30	30	30	30	180 (100)	90 (50)	90 (50)

Tabela 1.Pregled pacijenata u odnosu na primenjenu terapiju, medikamentnu i rehabilitacionu, kao i u odnosu na profilaksu (SP- sa profilaksom; BP- bez profilakse)

Table 1. Patients' distribution according to drug and rehabilitation treatment and prevention (SP – with prevention, BP – without prevention)

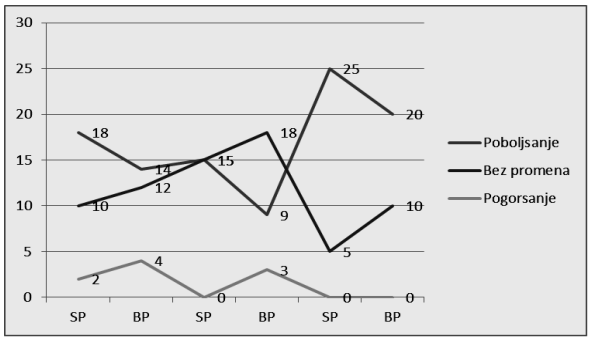
Pošto je broj pacijenata kod kojih je došlo do pogoršanja neznatan, razmatran je broj pacijenata kod kojih je postignuto poboljšanje u odnosu na ostale.



Grafikon 1. Procentualni prikaz pacijenata u odnosu na primenjenu terapiju

Graph 1. Patients's distribution in % according to treatment

U okviru grupa sa medikamentnom, respiratornom rehabilitacionom terapijom ili sa primenom obe vrste terapija, nema statistički značajne razlike u uspešnosti terapije u odnosu na grupe sa i bez profilakse, ali u celom uzorku ispitanika poboljšanje je značajno bolje kod pacijenata koji su koristili profilaksu, $p<0,05$ (tabela 2).



Grafikon 2. Brojčani parametri ishoda medikamentne, rehabilitacione i dvojne terapije
Graph 2.Outcomes (absolute numbers) of drug treatment, rehabilitation and both

	SP		BP	
Poboljsanje	58	64.44%	43	<0,05
Ostali	32	35.56%	47	0.02466

Tabela 2. Pregled statističke značajnosti pacijenata sa poboljšanjem uz korišćenje profilakse
Table 2. Significant improvement in patients with prevention

Tabela 3 (Table 3)

	Sa poboljšanjem	
MT	32	53.33%
RRT	24	40.00%
MT+RRT	45	75.00%

Tabela 4 (Table 4)

	Poboljšanje	
	p	p
MT vs RRT	n.s.	0.1149
MT vs MT+RRT	<0,05	0.0137
RRT vs MT+RRT	<0,001	0.0001

MT: *medikamentna terapija*
RRT*: respiratorna rehabilitaciona terapija*

Tabele 3 i 4.Procenat pacijenata kod kojih je zabeleženo poboljšanje stanja u toku hospitalizacije u odnosu na primenjenu terapiju sa statističkom značajnošću poboljšanja.
Tabeles 3 and 4.Percentage of patients improved in treatment and statistical significance related to type of treatment

Analiza dobijenih rezultata ispitivanih bolesnika pokazala je da su bolesnici lečeni medikamentnom terapijom i istovremeno respiratornim rehabilitacionim procedurama imali statistički značajnije poboljšanje u odnosu na bolesnike koji su lečeni samo medikamentnom terapijom (p<0,05), kao i statistički značajnije poboljšanje u odnosu na bolesnike koji su koristili samo respiratorno rehabilitacione procedure (p<0,001). Nije bilo statistički značajne razlike između grupe bolesnika lečene samo medikamentnom terapijom i grupe pacijenata lečene samo respiratornom rehabilitacionom terapijom (tabele 3 i 4).

Potpuna kontrola astme podrazumeva što manju varijabilnost bolesti do njene potpune eliminacije. (11) Simptomi astme imaju različito vreme javljanja i ispoljavaju se različitim intenzitetom, bez obzira na stepen težine bolesti, što najviše smeta dobroj kontroli astme(11,12).

Zdravstvena edukacija bolesnika i njihovih porodica je esencijalna komponenta respiratorne rehabilitacije jer je to ključ savremenog i uspešnog lečenja hroničnih bolesti (12). Zdravstvena edukacija predstavlja najbolji vid prevencije i mora biti organizovana u primarnoj, sekundarnoj i tercijarnoj prevenciji. Edukacija je permanentni proces i od pacijenta zahteva punu saradnju, strpljenje i upornost, a od edukatora ubedljivost, autoritativnost, toplinu, entuzijazam i pedagoški pristup u radu (12). Kvalitet života u vezi sa zdravljem je komponenta sveukupnog kvaliteta života koji je prevashodno određen zdravstvenim stanjem osobe i može biti pod uticajem različitih terapijskih intervencija (13). Ovaj pojam obuhvata percepciju bolesnika o uticaju bolesti i odgovarajuće terapije na njegovu fizičku i radnu sposobnost, psihičko stanje, socijalnu komunikaciju i somatsko zdravlje(13). Multidisciplinarni programi respiratorne rehabilitacije, prilagođeni svakom pojedinačnom bolesniku, vode računa o svim aspektima života koji su kod ovih bolesnika narušeni, pomažu im da se bolje osećaju i da bolje funkcionišu u svakodnevnim aktivnostima(13). Informacije o kvalitetu života mogu se dobiti samo od bolesnika, jer jedino oni imaju direktan uvid u svoja osećanja, misli i strahovanja. bolesnici sa sličnom simptomatologijom i rezultatima plućne funkcije mogu ispoljavati različite nivoe disfunkcije u svakodnevnom životu (14).

Fizikalna terapija se deli u dve grupe tehnika: plućna fizikalna terapija i disajni trening i fizičko vežbanje (15). Plućna fizikalna terapija sadrži mere predviđene da smanje otpor u disajnim putevima, poboljšaju intrapulmonalnu razmenu gasova i spreče komplikacije, a obuhvata: podsticanje kašlja - kontrolisani kašalj, položajnu drenažu bronhijalnog stabla, perkusiju i vibraciju grudnog koša (15).

Disajni trening i fizičko vežbanje su tehnike predviđene da poboljšaju funkciju respiratornih i perifernih mišića i olakšaju dispneju. Disajni trening je usmeren ka popravljanju funkcije dijafragme i ostalih inspiratornih mišića, ka povećanju ventilatorne efikasnosti i ka smanjenju dispneje. Tehnike disajnog treninga obuhvataju: kontrolisano disanje, relaksaciju, disajne vežbe, fizičko vežbanje (16). Podsticanje kašlja i kontrolisani kašalj kao i posturalna drenaža sprovedeni su kod 38 bolesnika jer su već iskašljavali, ali nedovoljno. Kontrolisani kašalj podrazumeva maksimalno dva nakašljavanja u toku forsiranog izdisaja izvedenog iz totalnog plućnog kapaciteta. Nakašljavanja se izvode u drugoj i trećoj trećini izdisaja (17).

Posturalna drenaža bronhijalnog stabla omogućuje da se sekret, svojom težinom, pokrene iz malih bronhija u veće,

a zatim iz većih bronhija na nivou bifurkacije odakle se kašljem izbacuje napolje (17). Drenaža je obično trajala 20 minuta, u proseku 7 dana (od 5-10 dana). Nakon sprovedene drenaže i manevra kontrolisanog kašlja deca nisu više kašljala niti ekspektorirala što ukazuje na benefit programa respiratorne rehabilitacije. Tehnike, disajni trening i fizičko vežbanje su upotrebljeni radi popravljanja funkcije respiratornih mišića-dijafragme i ispiratornih mišića u cilju povećanja ventilatorne efikasnosti i smanjenju dispnoje. Tehnike disajnog treninga obuhvataju kontrolisano disanje, relaksaciju, disajne vežbe, fizičko vežbanje (18). U našoj bolnici deca su svakodnevno imala disajni trening i fizičko vežbanje dva puta dnevno 21 dan uz individualizaciju pristupa i dužine vežbanja. Utvrđeno je da i manje zahtevni programi fizičkog vežbanja daju zadovoljavajuće rezultate.

Program fizičkog vežbanja podrazumeva trening donjih ekstremiteta, a najčešće se sprovodi kroz pešačenje i vožnju bicikla (19). Deca u našoj bolnici su išla u dozirane šetnje svakodnevno, uglavnom po ravnom. Uz vežbanje donjih ekstremiteta obavljale su se i vežbe gornjih ekstremiteta u cilju povećanja snage i izdržljivosti mišića ruku i ramenog pojasa. Treniranje izdržljivosti povećava otpornost mišića na zamor. Kod pacijenata koji su koristili respiratornu rehabilitaciju sprovedene su sve pomenute mere, tj.tehnike respiratorne rehabilitacije koje su dovele do povećanja fizičke kondicije i do smanjenja eventualne dispnoje. Praćenjem dece nakon otpusta u našoj ambulanti dobili smo podatke o veoma retkim egzacerbacijama, a kod skoro ¾ pacijenata nije bilo pogoršanja u toku praćenja.

Zaključak

Kod dece astmatičara lečenih na pedijatrijskom odeljenju naše bolnice statistički je značajno veće poboljšanje u grupi dece koja su lečena sinergističkom medikamentnom i rehabilitacionom terapijom što govori u prilog opravdanosti primene respiratorne rehabilitacije uz medikamentnu terapiju.

Literatura

1. Asher M, Montefort S, Bjorksten B, et al. Worldwide time trends in the prevalence of symptoms of asthma, allergic rhinoconjuctivitis, and ecyema in childhood: ISAAC Phases One and Three repeat multicountry cross-sectional surveys. Lancet 2006: 368: 733-743.
2. Lee YL, Hwang BF, Lin YC, Guo YL. Time trend of asthma prevalence among middle school children in Taiwan: ISAAC phases I and III surveys. Pediatr Allergy Immunol 2012: 23: 207-207.
3. Ozdoganoglu T, Songu M. The burden of allergic rhinitis and asthma. Ther Adv Respir Dis 2012: 6: 11-23.
4. Nissen SP, Kjaer HF, Host A, Nielsen J, Halken S. The natural course of sensitization and allergic diseases from childhood to adulthood. Pediatr Allergy Immunol 2013: 24: 549-55.
5. Ducharme FM, Tse SM, Chauhan B. Diagnosis, management, and prognosis of preschool wheeze. Lancet 2014: 383: 1593-604.
6. Bousquet J, Jefferz PK, Busse WW, Johanson M, Vignola AM. Asthma, from bronchoconstriction to airway inflamation and remodelling. A. J Respir Crit Care Med 2000; 161: 1720-1745.
7. Sharma S, Chhabra D, Kho AT, Hayden LP, Tantisira KG, Weis S. The genomic origins of asthma. Thorax 2014: 69: 481-7.
8. Martino D, Kesper DA, Amarasekera M, Harb H, Renz H, Prescott S. Epigenetics in immune development and in allergic and autoimmune diseases. J Reprud Immunol 2014: 104-105: 43-8.
9. Singh V. Effect of respiratory exercises on asthma: The Pink City Lung Exerciser. J Asthma 1987; 24: 355-359.
10. American thoracic society and European respiratory society. American Thoracic Society/European respiratory Society Statement on Pulmonary Rehabilitation. Am J Respir Crit Care Med 2006; 173: 1390- 413.
11. Faling LJ. Pulmonary rehabilitation – physical modalities. Clin Chest Med 1986;7: 599-618.
12. American Association of Cardiovascular and Pulmonary Rehabilitation. Guidelines for pulmonary rehabilitation programs, 3rd edition. Champaign, IL: Human Kinetics; 2004.
13. Fucbs-Climent D, Le Gallais D, Varray A, Desplan J, Cadopi M, Prefaut C. Quality of life and exercise tolerance in chronic obstructive pulmonary disease: effect of short and intensive inpatient rehabilitation program. Am J Phys Med Rehabil 1999; 78(4): 330-335.
14. Guyatt GH, Berman LF, Townsend M, Pugsley SO, Chamber LW. A measure of quality of life for clinical trials in chronic lung dsease. Thorax 1987;42(10):773-778.
15. Ambrosino N, Venturelli E, Vagheggini G, Clini E. Rehabilitation, weaning and physical therapy strategies in chronic critically ill patients. Eur Respir J 2012; 39:487-492.
16. Brooks D, Sottana R, Bell B, Hanna M, Laframboise L, Selvanayagarajah S, Goldstein R. Characterization of pulmonary rehabilitation programs in Canada in 2005. Can Respir J 2007;14:87-92.
17. Milan Jovanović, Savremeno lečenje i rehabilitacija obolelih od astme i hronične opstruktivne bolesti pluća; samolečenje uz pomoć lekara, Sokobanja, 2006; S 70-82.
18. Couser JL, Martinez FJ, Celli BR. Pulmonary rehabilitation that includes arm exercise reduces metabolic and ventilatory requirements for simple arm elevation. Chest 1993;17(3):171-177.
19. Clark CJ, Cochrane LM, Mackay E, Paton B. Sceletal muscle strength and endurance in patient with mild COPD and the effects of weight training. Eur Respir J 2000;15(1):92-97.

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PRIKAZ SLUČAJA – CASE REPORT

Zapaljenje pluća izazvano mikoplazmom pneumonije

Mycoplasma Pneumoniae Pneumonia in Children – Case Report

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Sažetak

Uvod. Zapaljenje pluća izazvano *mikoplazmom pneumonije* predstavlja atipičnu manifestaciju ovog oboljenja u pedijatrijskoj populaciji.
Prikaz bolesnika. U našem radu prikazujemo bolesnika uzrasta 9,5 godina obolelog od pneumonije, kod kojeg je dokazana infekcija *mikoplazmom pneumonije* sa komplikovanim kliničkim tokom. Takođe, registrovan je slab odgovor na primenjenu antimikrobnu terapiju čiju osnovu su činili makrolidni antibiotici. Zbog kliničke sumnje na multiplu etiologiju oboljenja i sa ciljem pravovremene prevencije potencijalnih kompikacija primenjena je kombinovana antibiotska terapija, nakon koje se registruje regresija oboljenja i normalizacija kliničkog stanja.
Zaključak.Infekcije izazvane *mikoplazmom pneumonije* u pedijatrijskoj populaciji su obično povezane sa blagim kliničkim tokom. Međutim, navedeni mikroorganizam ne retko uzrokuje atipično zapaljenje pluća, koje može da ima komplikovan klinički tok sa nezadovoljavajućim odgovorom na primenjenu terapiju, što zahteva dijagnostičku reevaluaciju oboljenja sa korekcijom terapijskog pristupa.

Ključne reči: Mikoplazma pneumonije, zapaljenje pluća, makrolidni antibiotici

Summary

Introduction. Mycoplasma pneumoniae causes atypical pneumonia in paediatric patients.
Case report.In our paper we present a 9.5 years old patient with pneumonia caused by Mycoplasma pneumoniae. Unsatisfactory response to macrolide antibiotic treatment and complicated clinical course were demonstrated. Antimicrobial therapy revision was introduced regarding clinical suspicion on the combined etiology aiming for appropriate prevention of additional complications. Subsequently, disease regression and clinical status normalization were registered.
Conclusion.Infections caused by mycoplasma pneumonia in paediatric population are usually associated with mild clinical course. However, this microorganism non-rarely causes atypical pneumonia. In patients with complicated lung infection, deteriorated clinical course and poor treatment response, both diagnostic reevaluation and treatment approach revisions are required.

Key words: Mycoplasma pneumonia, pneumonia, macrolide antibiotics

Uvod

Mikoplazma pneumonije (MP) izaziva infekcije gornjih i donjih disajnih puteva i predstavlja jedan od vodećih uzročnika atipičnih pneumonija kod dece i mladih odraslih osoba (1, 2). Bakterija *mikoplazma pneumonije* je najmanji samoreplikujući biološki organizam i karakterističan je po tome što nema ćelijsku membranu. Infekcije MP imaju endemski karakter, a epidemije se javljaju svakih 3 do 7 godina i traju od nekoliko meseci do nekoliko godina. Infekcija MP je obično blaga bolest sa inkubacionim periodom od 1-3 nedelje.

Kod bolesnika sa pneumonijom bolest se ispoljava povišenom telesnom temperaturom (38-39,5 °C) i produktivnim kašljem.

Radiografski nalaz je različit i podrazumeva prisustvo intersticijskih promena, bronhopneumonije, segmentnih i lobarnih zasenčenja i prisustvo pleuralnog izliva. Infekcija MP može prethoditi napadu astme, pogoršati astmu ili uticati na astmu sa hroničnim tokom (1, 3). Terapija pneumonije kod koje febrilnost traje duže od 48 sati podrazumeva primenu makrolidnih antibiotika (eritromicin, azitromicin i klaritromicin) (4).

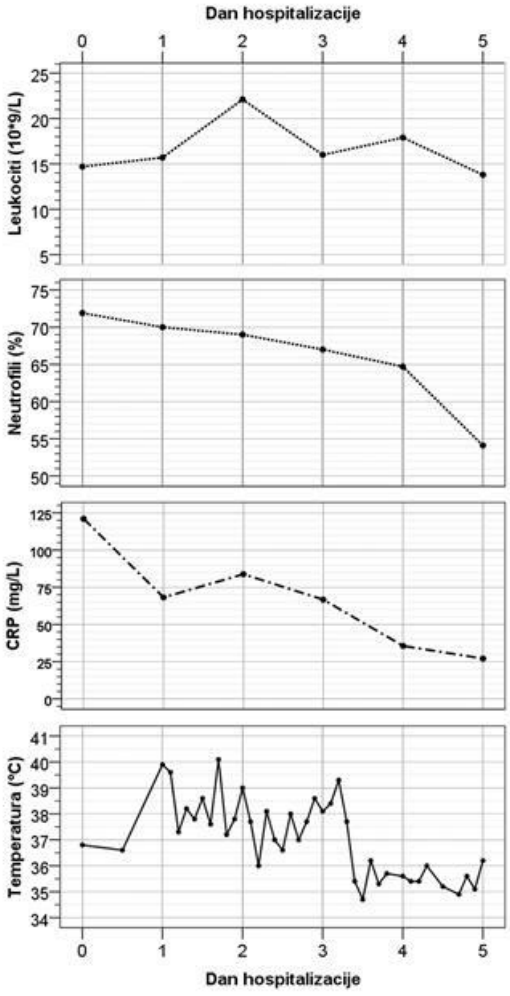
Alternativno se mogu upotrebiti nemakrolidni antibiotici (npr. amoksicilin/klavulonat i cefuroksim) i terapija kortikosteroidima za sistemsku primenu (npr. prednizolon u dozi od 1 mg/kg) (4).

Prikazujemo bolesnika, uzrasta 9,5 godina, koji je u našu ustanovu primljen zbog atipičnog zapaljenja pluća

izazvanog MP sa komplikovanim kliničkim tokom i nezadovoljavajućim odgovorom na inicijalnu antimikrobnu terapiju.

Prikaz bolesnika

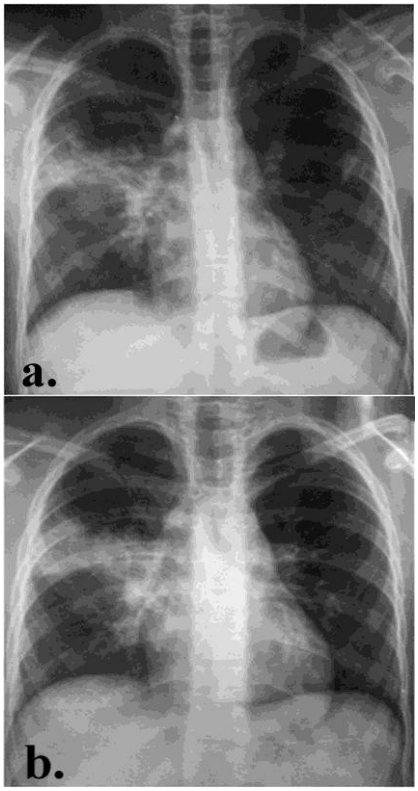
Devojčica uzrasta 9,5 godina, sa telesnom masom od 40 kg, je primljena u našu ustanovu zbog kašlja i povišene telesne temperature u trajanju od šest dana. Pre hospitalizacije devojčica je dobijala antibiotsku terapiju (amoksicilin i ceftriakson). Pri prijemu je bila svesna, afebrilna, eupnoična, acijanotična sa saturacijom oksihemoglobina od 98%. Ždrelo je bilo hiperemično, a nad plućima su auskultatorno registrovani kasnoinspirijumski pukoti sa desne strane. Laboratorijskom analizom registrovana je leukocitoza (14,7 x 10^9/L) sa predominacijom neutrofila (72%) i porast serumske koncentracije C-reaktivnog proteina (CRP) u vrednosti od 121 mg/L (slika 1).



Slika 1. Laboratorijske analize i febrilnost u toku prvih pet dana hospitalizacije

Figure 1. Laboratory parameters and febrile episodes during the first five days of hospitalization

Takođe, zabeležen je porast koncentracije aspartat transaminaze (AST) od 52 IU/L, laktat dehidrogenaze (LDH) od 697 IU/L, kretain kinaze (CK) od 430 IU/L i MB frakcije kretain kinaze (CK-MB) od 38 IU/L. Pored navedenog, registrovane su blago snižene koncentracije proteina i albumina u krvi. Radiografija srca i pluća je pokazala zone konsolidacije desnog plućnog režnja u gornjem i parakardijalnom segmentu (slika 2).



Slika 2.Radiografija srca i pluća prvog (a) i četvrtog (b) dana hospitalizacije. Registruju se zone konsolidacije desnog plućnog režnja u gornjem i parakardijalnom segmentu.

Figure 2. Chest X ray the first day (a) and forth day (b) of hospitalization. Consolidation of the right upper lobe detected

Po prijemu je započeta terapija azitromicinom uz prethodnu terapiju ceftriaksonom. S obzirom na održavanje povišene telesne temperature u terapiju su trećeg dana hospitalizacije uključeni vankomicin i meropenem. Febrilnost (39-40 °C) se održavala tokom više od 72h po prijemu, nakon čega dolazi do normalizacije telesne temperature sa pratećom normalizacijom broja leukocita, neutrofila i serumske koncentracije CRP-a (slika 1). Zasejane bakteriološke kulture (hemokultura, urinokultura i sputum) su bile sterilne, a infekcija mikoplazmom pneumonije je dokazana pozitivnim nalazom analize antitela klase IgM i IgG specifičnih za navedeni uzročnik. Devojčica je otpuštena 11. dana hospitalizacije u dobrom opštem stanju, afebrilna i sa urednim kliničkim nalazom.

Uzročnici vanbolničkih pneumonija u školskom uzrastu koje zahtevaju hospitalizaciju su bakterije (60%), virusi (43%), *mikoplazma pneumonije* (14%) i *hlamidija pneumonije* (3%) (5). Mešovita infekcija je prisutna kod 23% obolelih. Najčešći tipični bakterijski uzročnik zapaljenja pluća je *streptokokus pneumonije* koji izaziva ¾ svih bakterijskih pneumonija. *Mikoplazma pneumonije* izaziva 14% navednih infekcija, od kojih je polovina (7%) izazvana izolovanim uzročnikom, a druga polovina (7%) u kombinaciji sa drugim mikroorganizmima (5). Dodatno, podaci iz literature ukazuju da je MP odgovorna za 9-45% vanbolničkih pneumonija kod dece starije od 5 godina (6-10), a virusi za 65% ovih oboljenja u poredinim regionima (11). Od izuzetne važnosti je rano prepoznavanje infekcije MP. Kombinacija seroloških ispitivanja i PCR-a je standard za dijagnozu infekcije MP. Međutim, rana dijagnoza MP pneumonije je ograničena zbog nedostatka IgM klase imunoglobulina i nepouzdanih rezultata PCR analize. Infekcija MP u uzrastu manjem od 2-5 godine se razlikuje od kliničke slike u uzrastu većem od 6 godina. Naime, kod starije dece duže je trajanje febrilnosti (više od 10 dana kod 40% bolesnika), veće su koncentracije CRP-a, manje vrednosti broja leukocita i limfocita, a plućne lezije su težeg karaktera (4, 12). Takođe, povišena telesna temperatura iznad 38 °C, koja traje više od tri dana po prijemu ukazuje na bakterijsku etiologiju. Za MP su karakteristične ekstrapulmonalne manifestacije bolesti (npr. osip koji se javlja kod 10% bolesnika) i porast serumske koncentracije enzima jetre koji se registruje kod 5% obolelih, a registrovan je i kod našeg bolesnika.

Naš bolesnik je u početku bolesti lečen amoksicilinom, koji predstavlja lek prvog izbora za oralnu antimikrobnu terapiju vanbolničkih pneumonija, s obzirom da je efikasan za većinu patogena (ne uključujući MP) (13). S obzirom da nije registrovan adekvatan odgovor na terapiju amoksicilinom i dodatnim cefalosporinima treće generacije, kao i zbog sumnje na zapaljenje pluća izazvano MP po prijemu u bolnicu ordinirana je terapija makrolidnim antibioticima (13). Navedena terapija je povezana sa bržom rezolucijom plućnih promena izazvanih ovim atipičnim uzročnikom. Međutim, kod pojedinih bolesnika se može očekivati razvoj teškog zapaljenja pluća i značajnih vanplućnih manifestacija bez obzira na primenjenu terapiju makrolidnim antibioticima, kao što je bio slučaj *onije* (MR-MP) su praćene dužim trajanjem febrilnosti, rezistencijom na terapiju makrolidima i dobrim odgovorom na zamenu antibiotske terapije (14-17). Vanbolničko zapaljenje pluća koje zahteva hospitalizaciju izazvano MP, u odnosu na infekcije drugim uzročnicima, je povezana sa nižim prosečnim vrednostima broja leukocita (13,6/mm3 vs. 19,9/mm3) i nižim prosečnim serumskim koncentracijama CRP-a (50,0-60,4 mg/L vs. 128,6 mg/L) (11). Maksimalna telesna temperatura unutar prvih 72h hospitalizacije kod bolesnika sa vanbolničkim pneumonijama uzrokovanim tipičnim bakterijama iznosi 38,4 °C, dok kod bolesnika sa zapaljenjem pluća uzrokovanim virusima, MP i hlamidijom pneumonije iznosi 37,5-37,6 °C (5). Takođe, kombinovane infekcije pluća su povezane sa održavanjem febrilnosti (38,5°C) tokom prva tri dana hospitalizacije. Kod našeg bolesnika serumska koncentracija CRP-a pri prijemu je bila 121 mg/L, a febrilnost se održavala u prvih >72h hospitalizacije uz perzistiranje kliničkih i radiografskih parametara zapaljenja, te je zaključeno da se radi o visokom riziku za postojanje kombinovane bakterijske etiologije oboljenja i značajnoj verovatnoći za dodatnu infekciju rezistentnim sojem *streptokokusa pneumonije*. Na osnovu navedenog korigovana je antimikrobna terapija tj. zamenjen je ceftriakson vankomicinom (i meropenemom). Kod progresivnih MP infekcija (uključujući i infekcije MR-MP sojem), koje ne reaguju na antibiotsku terapiju, terapija kortikosteroidima (prednizolon) dovodi do kliničkog i radiološkog poboljšanja (12, 18). Potencijalnu alternativu terapiji prednizolonom predstavlja primena metilprednizolona i intravenskih imunoglobulina (4). Kod našeg bolesnika nije ordinirana kortikosteroidna terapija zbog značajnog poboljšanja nakon dodatne korekcije antimikrobne terapije.

Zaključak

Iako je infekcija mikoplazmom pneumonije obično povezana sa inaparentnim kliničkim tokom, pojedini bolesnici imaju komplikovano kliničko ispoljavanje bolesti koje se pre svega odnosi na zapaljenje pluća. Lek izbora za infekciju MP predstavljaju makrolidni antibiotici, čija primena je uglavnom povezana sa rezolucijom plućnih promena. Međutim, kod bolesnika rezistentnih na terapiju makrolidima, neophodna je detaljna dijagnostička evaluacija sa ciljem pravovremene predikcije potencijalnih kompikacija i korekcije uzročne i simptomatske terapije.

Literatura

1. Atkinson TP, Balish MF, Waites KB. Epidemiology, clinical manifestations, pathogenesis and laboratory detection of Mycoplasma pneumoniae infections. FEMS Microbiol Rev. 2008 Nov;32(6):956-73.
2. Lee KY. Paediatric respiratory infections by Mycoplasma pneumoniae. Expert Rev Anti Infect Ther. 2008 Aug;6(4):509-21.
3. Sutherland ER, Martin RJ. Asthma and atypical bacterial infection. Chest. 2007 Dec;132(6):1962-6.
4. Youn YS, Lee KY. Mycoplasma pneumoniae pneumonia in children. Korean J Pediatr. 2012 Feb;55(2):42-7.
5. Michelow IC, Olsen K, Lozano J, Rollins NK, Duffy LB, Ziegler T, et al. Epidemiology and clinical characteristics of community-acquired pneumonia in hospitalized children. Paediatrics. 2004 Apr;113(4):701-7.
6. Block S, Hedrick J, Hammerschlag MR, Cassell GH, Craft JC. Mycoplasma pneumoniae and Chlamydia pneumoniae in paediatric community-acquired pneumonia: comparative efficacy and safety of clarithromycin vs. erythromycin ethylsuccinate. Pediatr Infect Dis J. 1995 Jun;14(6):471-7.

7. Gendrel D, Raymond J, Moulin F, Iniguez JL, Ravilly S, Habib F, et al. Etiology and response to antibiotic therapy of community-acquired pneumonia in French children. Eur J Clin Microbiol Infect Dis. 1997 May;16(5):388-91.
8. Harris JA, Kolokathis A, Campbell M, Cassell GH, Hammerschlag MR. Safety and efficacy of azithromycin in the treatment of community-acquired pneumonia in children. Pediatr Infect Dis J. 1998 Oct;17(10):865-71.
9. Heiskanen-Kosma T, Korppi M, Jokinen C, Kurki S, Heiskanen L, Juvonen H, et al. Etiology of childhood pneumonia: serologic results of a prospective, population-based study. Pediatr Infect Dis J. 1998 Nov;17(11):986-91.
10. Principi N, Esposito S, Blasi F, Allegra L. Role of Mycoplasma pneumoniae and Chlamydia pneumoniae in children with community-acquired lower respiratory tract infections. Clin Infect Dis. 2001 May 1;32(9):1281-9.
11. Tsolia MN, Psarras S, Bossios A, Audi H, Paldanius M, Gourgiotis D, et al. Etiology of community-acquired pneumonia in hospitalized school-age children: evidence for high prevalence of viral infections. Clin Infect Dis. 2004 Sep 1;39(5):681-6.
12. Youn YS, Lee KY, Hwang JY, Rhim JW, Kang JH, Lee JS, et al. Difference of clinical features in childhood Mycoplasma pneumoniae pneumonia. BMC Pediatr. 2010;10:48.
13. Harris M, Clark J, Coote N, Fletcher P, Harnden A, McKean M, et al. British Thoracic Society guidelines for the management of community acquired pneumonia in children: update 2011. Thorax. 2011 Oct;66 Suppl 2:ii1-23.
14. Matsubara K, Morozumi M, Okada T, Matsushima T, Komiyama O, Shoji M, et al. A comparative clinical study of macrolide-sensitive and macrolide-resistant Mycoplasma pneumoniae infections in paediatric patients. J Infect Chemother. 2009 Dec;15(6):380-3.
15. Suzuki S, Yamazaki T, Narita M, Okazaki N, Suzuki I, Andoh T, et al. Clinical evaluation of macrolide-resistant Mycoplasma pneumoniae. Antimicrob Agents Chemother. 2006 Feb;50(2):709-12.
16. Averbuch D, Hidalgo-Grass C, Moses AE, Engelhard D, Nir-Paz R. Macrolide resistance in Mycoplasma pneumoniae, Israel, 2010. Emerg Infect Dis. 2011 Jun;17(6):1079-82.
17. Miyashita N, Maruyama T, Kobayashi T, Kobayashi H, Taguchi O, Kawai Y, et al. Community-acquired macrolide-resistant Mycoplasma pneumoniae pneumonia in patients more than 18 years of age. J Infect Chemother. 2011 Feb;17(1):114-8.
18. Lee KY, Lee HS, Hong JH, Lee MH, Lee JS, Burgner D, et al. Role of prednisolone treatment in severe Mycoplasma pneumoniae pneumonia in children. Pediatr Pulmonol. 2006 Mar;41(3):263-8.

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Izveštaj sa 25. Kongresa Evropskog respiratornog udruženja

Zorica Živković

U Amsterdamu, Holandija, septembra 2015.godine održan je 25. po redu kongres Evropskog Respiratornog udruženja. Pored brojnih sesija iz svih oblasti respiratorne medicine, a bilo ih je preko sto tokom 4 dana kongresa, održano je i 20 poslediplomskih kurseva, edukativnog sadržaja sa temama:respiratorne infekcije, astma, hronična plućna bolest, tuberkuloza, endoskopske metode ispitivanja i lečenja malignih bolesti pluća, plućna hipertenzija i slično. Prvog dana 26. Septembra jedan broj učesnika iz celoga sveta je polagao pismeni test iz adultne i pedijatrijske pulmologije, kojim se stiče diploma validna za evropske zemlje, a osnovni cilj je harmonizacija respiratorne medicine na internacionalnom nivou. Preko 200 lekara je učestvovalo na ovom testu, a skoro 20 000 lekara je učestvovalo u radu kongresa, aktivno svojim prezentacijama i naravno prisustvom na naučnim sesijama, simpozijumima sa temama o najnovijim dostignućima iz respiratorne medicine. Jedna od najnovijih aktivnosti je projekat Evropskog Respiratornog udruženja i Evropske Respiratorne fondacije pod nazivom Healthy Lungs for Life (Zdrava pluća za život). Kampanja je usmerena na podizanje svesti opšte javnosti prema pacijentima sa respiratornim oboljenjima, u najvećoj meri na poboljšanje njihovog kvaliteta života, ali takojde i prema onima koji mogu biti pacijentima u budućnosti.

Cilj ove kampanje je PREVENCIJA i EDUKACIJA široke javnosti kako bi se smanjili štetni efekti plućnih bolesti na društvo u celini. Tema za 2015. Godinu je „Take the Active Option“ , u slobodnom prevodu „Budimo aktivni u lečenju respiratornih bolesti“, i promoviše značaj redovne fizičke aktivnosti i spremnosti obolelih od hroničnih plućnih bolesti. Očigledni dokazi su potvrdili da je dobra fizička aktivnost najbolji pokazatelj poboljšanja kvaliteta života zdravih osoba i da značajno smanjuje rizik od hroničnih oboljenja.

Ključne poruke kampanje su:

- Fizička aktivnost je važna za respiratorno zdravlje, kako u opštoj populaciji tako i medju hroničnim respiratornim bolesnicima
- Redovna fizička aktivnost i dobra kondicija poboljšavaju kvalitet života i smanjuju rizik od hroničnih stanja
- Postoji nivo fizičke aktivnosti koji svaki pacijent može postići
- Loša kondicija pogoršava stanje hroničnih plućnih bolesti i astme
- Tokom fizičke aktivnosti važno je udisati što kvalitetniji vazduh

Kako bi se pokazalo da kampanja nije samo slovo na papiru ili medijska senzacija, u kongresnom prostoru je održan “ Lung Cycle Challenge”, interesantan vizuelni način da se pomoću pumpe na nožni pogon postiže snaga kojom se ubacuje vazduh u model pluća, svaki učesnik ili posetilac mogao je da odgovori na ovaj izazov. Takodje je svakom delegatu preporičeno da predje 10 000 koraka u jednom danu Kongresa. Tokom Kongresa, na glavnom trgu u Amsterdamu - Dam Square postavljene su ključne poruke kampanje. Sve o ovoj aktivnosti može se naći na: www.healthylungsforlife.org.

Novosti iz oblasti respiratorne medicine

Navike prethodnih generacija i prevencija astme

Izloženost duvanskom dimu i rizik za pojavu astme – najnovija istraživanja pokazuju da deca čije su bake pušile u toku trudnoće, imaju povećan rizik od astme čak i ako njihove majke nisu pušile. Prema podacima Švedskog registra iz osamdesetih godina 20. veka, u ovakvim slučajevima rizik za astmu je povećan 10 do 22%, navodi professor Bertil Forsberg, sa Umea Univerziteta u Švedskoj. Dr Karolin Lodž iz Melburna, Australija predpostavila je da epigenetska transmisija faktora rizika iz okruženja u prethodnim generacijama, ima uticaja na kasnije rizike od oboljevanja od astme. Švedski i autralijski istraživači su skrenuli pažnju da interpretacija faktora rizika za astmu, podrazumeva trenutnu izloženost štetnim agensima iz okruženja, genetsku predispoziciju, ali i nasledjene, negenetske rizike kojima su prethodne generacije bile izložene. Za sada, transgeneracijski faktori rizika, ispitivani su samo po ženskoj liniji, a dalja istraživanja su u planu i po muškoj liniji, znači da li je aktivno pušenje bake tokom trudnoće i radjanja muškog deteta, faktor rizika za pojavu astme kod sinovljeve dece. Ovakva zapažanja, vode nas u pravcu korekcije ponašanja sadašnjih generacija, sa ciljem prevencije bolesti kod budućih generacija. Time se potvrdjuje stav da korektan način života i redukcija štetnih faktora iz spoljnje sredine, pomažu u prevenciji bolesti i u dalekoj budućnosti.

Respiratorne infekcije, nazofaringealni mikrobiom i astma

Grupa istraživača iz Švajcarske, vodjena poznatim ekspertima Prof Urs Freyem i dr Filipom Latzinom, istraživala je interakciju infekcije Rinovirusom (RV) i rasprostranjenost bakterija na nazofaringealnoj sluznice dece, kao i njihov zajednički uticaj na razvoj astme u kasnijem životu.

Prospektivno praćenje tokom prve godine života sprovedeno je kod 32. inače zdrave dece, bris nazofaringealne sluznice je ispitivan svake dve nedelje, od 5 nedelje života do kraja prve godine, na prisustvo RV i još desetak različitih virusa. Rezultati su pokazali da je bakterijski diverzitet na respiratornoj sluznici deteta smanjen kada je dete inficirano RV i ima izražene simptome infekcije. Suprotno tome, kod dece kod koje je detektovana asimptomatska kolonizacija, biodiverzitet i gustina bakterija na nazofaringealnoj sluznici su bili u granicama očekivanih normalnih vrednosti. Uz to, deca sa čestim respiratornim

epizodama u prvoj godini života, na kraju perioda praćenja, imala su osiromašen mikrobiom na nazalnoj sluznici. Takvi nalazi ukazuju na interakciju RV infekcije, simptoma i mikrobioma u ranom uzrastu deteta, sa mogućom značajnošću za PREVENTIVNE mere i kasniji razvoj astme. Dr Insa Korten, nosilac ovog istraživanja, navodi da je značaj mikrobioma na crevnoj sluznici odavno shvaćen kao ciljno mesto za prevenciju, te se uvode oralni probiotici kod dece radi očuvanja normalnih varijeteta bakterija. Postoji vrlo opravdana hipoteza da bi promene mikrobioma na respiratornoj sluznici mogle biti povezane sa kasnijim razvojem astme, te bi u tom slučaju intervencija na nivou nazalne i respiratorne bakterijske flore bila prvi i važan PREVENTIVNI korak.

World Pneumonia Day: 12 November, 2015

Forum of International Respiratory Societies (FIRS) zalaže se za PREVENCIJU pneumonija i uspešniji tertman na globalnom nivou kroz inicijativu nazvanu "Decade of the Lung" .

Širom sveta, 12. novembra 2015 održavaju se konferencije za štampu, pod sloganom Decade of the Lung, sa namerom da se naglasi značaj respiratornih bolesti I pre svega pneumonija, kao jedna od pet najvažnijih respiratornih bolesti I kod dece I kod odraslih. Pneumonija je glavni uzrok smrtnosti kod dece ispod 5 godina starosti, hospitalizacije i poseta lekaru. Skoro million dece u svetu još umire zbog pneumonije, a veliki broj je moguće prevenirati.

Najčešće smrtni ishod se dešava u zemljama nižeg ekonomskog razvoja I kod dece mladje od dve godine života. Takodje, više od polovine smrtnih ishoda dešava se van zdravstvenih ustanova, štp znači u sredinama gde je rasprostranjenost zdravstvene mreže insuficijentna.

Pneumonijaa je preventabilna i izlečiva bolest. Upotreba konjugovane vakcine protiv H influenzae b (HiB) i pnuemokoka (PCV) značajno je smanjila globalnu učestalost pneumonija kod dece. Visoka pokrivenost PCV kod dece takodje prevenira pojavu pneumonija kod odraslih, stečenim imunitetom. Postoje, naravno i zemlje u kojima PCV još uvek nije uvedena u kalendar imunizacije dece, te se prevencija u tim sredinama još uvek ne sprovodi na pravi način.
FIRS je objavio preporuke namenjene vladinim i nevladinim organizacijama, ministarstvima zdravlja, lekarima, nosiocima zdravstvenih preventivnih programa, sa ciljem da se pojačaju mere PREVENCIJE:

- Poboljšati zdravstvene sisteme na državnom nivou i učiniti pristupačnijim relevantne vakcine, naročito PCV
- Poboljšati nutritivni status dece naročito podržavanjem dojenja optimalno do 6 meseci života
- Promovisati inicijative protiv izlaganja duvanskom dimu, i spoljnim faktorima zagadjenja vazduha
- Redukovati HIV-udružene pneumonije preventivnim programima zdravstven zaštite majki i dece i ranom upotrebom retroviralne terapije
- Povećati finansijska ulaganja u istraživačke projekte o respiratornim infekcijama i pneumonijama kod dece.

Izveštaj sa 25. Kongresa Evropskog respiratornog udruženja

Ivana Đurić Filipović

U okviru ovogodišnjeg Evropskog respiratornog kongresa održano je više predavanja u formi poslediplomskih kurseva što podrazumeva da najistaknutiji stručnjaci iz celog sveta izlažu najnovija saznanja i dostignuća u oblasti respiratorne medicine. Kurs sa pedijatrijskom temom održan je 26.9.2015. godine pod nazivom:

Lower respiratory tract infections in children – Infekcije donjeg respiratornog trakta kod dece, izložene su sledeće teme:

1. Evaluacija deteta sa čestim respiratornim infekcijama – prof. dr Mark Everard – University of Western Australia-Princess Margaret Hospital, Perth
2. Lečenje i prevencija bronhiektazija koje nisu u vezi sa cističnom fibrozom – Alexander Moeller / University Children Hospital Zurich
3. Bronhiolitis-prevencija,dijagnoza i terapija – prof. dr Fabio Midulla – Paediatric Department „Sapienza“ – University of Roma
4. Atipične infekcije donjeg respiratornog trakta- prof. dr Paul Aurora, Great Ormond Hospital for Children, London

Profesor Everard je u okviru prvog predavanja istakao značaj adekvatne evaluacije deteta sa čestim respiratornim infekcijama kao jednim od problema sa kojim se najčešće susreću pedijatri na svim nivoima zdravstvene zaštite. Tokom poslednje decenije najveći deo pažnje stručnjaka iz oblasti respiratorne medicine zaokuplja astma. Ne tako retko dešavalo se da se astma prekomerno dijagnostikuje i leči kod dece koja su ustvari imala ponovljene respiratorne infekcije sa vizingom. Sa druge strane suočavamo se i sa prekomernom upotrebom antibiotika kod dece sa srednje do umereno teškom astmom iako su studije pokazale da astma nije tako često udružena sa infekcijama donjeg respiratornog trakta. Prema navodima prof. Everarda, kod sumnje na ovaj problem dete treba pažljivo pregledati u akutnoj fazi bolesti i posebno obratiti pažnju na sledeća pitanja:

1. Da li je uopšte u pitanju ponovljena infekcija donjeg respiratornog trakta?
2. Da li je dete zdravo ili postoji neki potencijalni faktori rizika (sumnja na cističnu fibrozu, primarnu cilijarnu diskineziju, imunodeficijencije, urođene srčane mane)?
3. Da li postoji zahvaćenost nekog drugog organa ili sistema? Ovde pre svega mislimo na poremećaje gastrointestinalnog trakta (povraćanje, dijareja, malnutricija)?

Poslednjih godina sve veća pažnja usmerena je na ulogu bakterijskog biofilma u patogenezi ponovljenih infekcija donjeg respiratornog trakta. Bakterijski biofilm se najčešće formira kao posledica neadekvatnog mukocilijarnog klirensa. Može se formirati i u gornjim i u donjim partijama respiratornog trakta i predstavlja planktonske forme adherisanih bakterija koje se usled virusih infekcija rasejavaju. Formiranjem biofilma bakterije se štite od dejstva antibiotika i dovode do rekurentnih bakterijskih infekcija koje se najčešće manifestuju kao pneumonija ili rekurentni bakterijski bronhitis. Najčešći uzročnici rekurentnih pneumonija kod dece su Streptococus pneumonije, Haemophilus influenzae netipizirani i Moraxella catharalis. Pored nespecifičnih mera prevencija izuzetno je važna sistemska vakcinacija dece pre svega protiv Streptococus-a pneumoniae.

U okviru drugog izlaganja profesor Moeller je naglasio značaj prepoznavanja, lečenja i prevencije bronhiektazija kod dece koja nemaju cističnu fibrozu. Bronhiektazije, kao što je naglašeno tokom prethodnog predavanja, predstavljaju ireverzibilnu dilataciju i zadebljanje zida bronha uglavnom kao posledica ponovljenih uticaja spoljnjih etioloških činilaca. Inflamacija i hronična bakterijska infekcija zauzimaju najznačajnije mesto u njihovom nastanku. Prema rezultatima epidemioloških studija u preko 60% dece sa bronhiektazijama postoji neko primarno oboljenje (primarna imunofedicijencija, kongentialna malformacija, primarna cilijarna diskinezija). Predavač je naročito istakao pojavu dugotrajnog vlažnog kašlja kao jednog od osnovnih kliničkih znakova bronhiektazija. Opasnost od pojave bronhiketazija postoji i kod dece koja ne odgovaraju na dugotrajnu antibiotsku terapiju.

Prema navodima prof Moeller-a, glavne smernice za lečenje i prevenciju bronhiektaziju su:

1. Tehnika „čišćenja“ respiratornog trakta koja podrazumeva: PEP (oscillatory positive expiratory pressure), fizikalnu terapiju i vežbe disanja
2. Terapija hipertonim i hiperosmolarnim rastorima aerosola
3. Bronhodilatori najčešće nisu od velike pomoći
4. Terapija antibioticima se preporučuje samo prilikom epizoda egzacerbacije
5. Redovno bavljenje umerenom fizičkom aktivnošću
6. Operativni pristup se retko primenjuje
7. U cilju primarne specifične prevencije kod ovih pacijenata se preporučuje redovna sezonska vakcinacija protiv gripa, kao i vakcinacija protiv streptokoka pneumonije

Tema trećeg predavanja u okviru poslediplomskog kursa je bila prevencija, dijagnoza i terapija bronhiolitisa. Prof. Midulla, podsetio je da bronhiolitis predstavlja akutnu virusnu infekciju terminalnih respiratornih bronhiola kod dece. Prema najnovijim studijama najznačajni izazivači bronhiolitisa su: respiratorni sincicijalni virus, bocavirus, rinovirus, humani metapneumovirus, virus influenze tip A i B, virus parainfluenze. Starost ispod tri meseca, prematuritet sa bronhopulmonalnom displazijom i pratećim komorbiditetima kao što su kardiovaskularna oboljenja, imunodeficijencije i hronična oboljenja respiratornig trakta predstavljaju najznačajnije faktore rizika. Kao što je dobro poznato dijagnoza bronhiolitisa se postavlja na osnovu kliničke slike: epidemiološki podatak o kontaktu detata

mlađeg od 12 meseci sa osobom koja je obolela od virusne respiratorne infekcije, znaci akutne infekcije donjeg respiratornog trakta kojima su prethodili znaci oboljenja gornjih respiratornih puteva. Dodatna dijagnostika u smislu radiografija je retko potrebna. Rinoreja i kašalj praćeni subfebrilnošću su uglavnom najčešći inicijalni simptomi bronhiolitisa, iako se u izvesnim situacijama kao prvi simptom može javiti i apnea. Dete sa bronhiolitisom je najčeće dehidrirano i potrebna mu je rehidratacija i oksigenacija. Prof Midulla je istakao da podaci najnovijih studija ne pokazuju pozitivno dejstvo inhalacionih ili sistemskih glikokortikoida.

Antibiotska terapija se preporučuje samo u slučajevima kada postoji opasnost od bakterijske superinfekcije npr. kod pacijenata koji su intubirani. Kada su mere prevencije u pitanju pored nespecifičnih mera u vidu održavanja higijenskih mera izuzetno je važna i vakcinacija dece protiv sezonskog gripa i streptokoka pneumonie.

Poslednje predavnje je bilo posvećeno atipičnim infekcijama donjeg respiratornog trakta na koje posebno treba obratiti pažnju kod pacijenata sa primarnim i sekundarnim imunodeficijencijama.

Organizacija poslediplomskih kurseva je od izuzetnog značaja u okviru kongresa jer su ovi kursevi orijentisani ka obrađivanju najaktuelnijih tema iz određene oblasti sa obiljem prikaza veoma interesantnih slučajeva iz kliničke prakse, i izuzetno su zanimljivi i važni naročito mlađim učesnicima koji su na početku svoje karijere.

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Diabetes Prevention Program Research Group. Hypertension, insulin, and proinsulin in participants with impaired glucose tolerance. Hypertension. 2002;40(5):679-686.

Knjiga

Murray PR, Rosenthal KS, Kobayashi GS, Pfaller MA. Medical microbiology. 4th ed. St. Louis: Mosby; 2002.

Poglavlje u knjizi

Meltzer PS, Kallioniemi A, Trent JM. Chromosome alterations in human solid tumors. In: Vogelstein B, Kinzler KW, editors. The genetic basis of human cancer. New York: McGraw-Hill; 2002. p. 93-113.

Saopštenje sa skupa

Harnden P, Joffe JK, Jones WG, editors. Germ cell tumours V. Proceedings of the 5th Germ Cell Tumour Conference; 2001 Sep 13-15; Leeds, UK. New York: Springer; 2002.

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Book chapter

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S. pneumoniae izaziva spektar **invazivnih pneumokoknih bolesti - IPB** (meningitis, sepsa, bakterijemija i bakterijska pneumonija) **i neinvazivnih pneumokoknih bolesti (**akutni otitis media - AOM, bronhitis, sinuzitis).[1]

Dok je rizik za oboljevanje od invazivnih infekcija manji nego rizik za oboljevanje od OM (otitis media) ili pneumonije, njihove posledice su često ozbiljnije, i vode ka hospitalizaciji ili mogućoj smrti.[1,2]

Procenjuje se da, godišnje, na globalnom nivou, od 8,8 miliona smrtnih slučajeva u uzrastu ispod 5 godina, 500 000 njih umre usled invazivne pneumokokne bolesti.[3,4]

Kako se 75% svih slučajeva IPB i 83% pneumokoknih meningitisa javljaju kod dece mlađe od 2 godine, potreba za ranom zaštitom je veoma važna.[4]

Akutni *otitis media* (AOM) je česta bolest u dečijem dobu sa različitom etiologijom. Bakterije mogu biti uzrok od 60% do 70% kliničkih epizoda AOM. *Streptococcus pneumoniae* i netipizirani *Haemophilus influenzae* (NTHi) su najčešći izazivači bakterijskog AOM na svetskom nivou.[5] AOM je najčešća indikacija za antibiotsku terapiju kod dece u razvijenim zemljama.[6] OM može dovesti do ozbiljnih sekvela, uključujući gubitak sluha.[7] Vakcinacija pre 6. meseca života je najbolja preventivna opcija, zato što je najčešći period javljanja AOM u uzrastu od 6-12 meseci.[8]

Globalno, pneumokokna bolest je najčešća bolest, koja se može prevenirati vakcinama, u uzrastu dece mlađe od 5 godina.[9]

WHO navodi da je u mnogim zemljama rutinska vakcinacija pneumokoknom konjugovanom vakcinom dovela do dramatičnog smanjenja incidence IPB i na nekim mestima je IPB izazvana serotipovima koje se nalaze u vakcini teoretski iščezla, čak i u starosnim grupama koje nisu u programu imunizacije (grupni imunitet).[4]

Takođe, vakcinacija protiv pneumokokne bolesti dovodi do smanjenja incidence bakterijskih bolesti i restrikcije u korišćenju antibiotika što je krucijalno kako bi antibiotici ostali efikasna primarna terapija[10].

Saznajte više o vakcini Synflorix® od Vaših kolega iz kompanije GSK.

RS/SYN/0006/14a, septembar 2015.

Reference:
1 . World Health Organisation. Weekly Epidemiological Record 2007; 82; 93–104. 2. O'Brien *et al. Lancet* 2009; 374: 893–902; 3. WHO. Estimated Hib and pneumococcal deaths for children under 5 years of age, 2008; 4. WHO. Wkly Epidemiol Rec 2012;87(14):129–144; 5. SmPC Synflorix, ALIMS maj 2015; 6. Palmu A. Effect of pneumococcal Haemophilus influenza protein D conjugate vaccine (PHiD-CV10) on outpatient antimicrobial purchases: a double blind, cluster randomised phase 3-4 trial www.thelancet.com/infection, published online November 2013; 7. Rodgers GL et al. Global serotype distribution among SP isolates causing OM in children. Potential implications for pneumococcal conjugate vaccines. Vaccine 2009; 3802-3810. 8. Kunev K. Treatment and profilaxis of acute otitis media. Guidelines of Bulgarian National ORL Society 2009. 9. Johnson HL. Et al. Systematic evaluation of serotypes causing invasive pneumococcal disease among children under five: the pneumococcal global serotype project. Plos medicine 2010. 10. Prymula R. Et al. Paediatric pneumococcal disease in central Europe. Eur J Clin Microbiol Infect Dis 2011.

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PREVENTIVE PAEDIATRICS

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