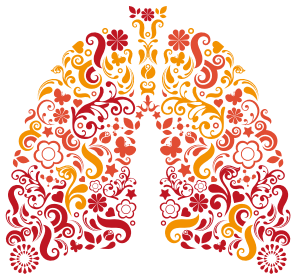

XXVIII SLOVAK-POLISH VOJTEK – RUDNIK PNEUMOPHTISIOLOGICAL AND IMMUNOALLERGOLOGICAL DAYS

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Alveolar hemorrhage – suspicion of pulmonary hemosiderosis? – case report

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Introduction: Idiopathic pulmonary hemosiderosis (IPH) is a disease of unknown cause characterized by repeated episodes of intra-alveolar hemorrhage that lead to abnormal iron accumulation in the lungs in the form of hemosiderin. Clinically it manifests a triad of symptoms such as: hemoptysis, parenchymal infiltrates on x-ray and anemia. There are distinguished two forms of pulmonary hemosiderosis – primary and secondary. The etiopathogenesis of the disease takes into account toxic effects of environmental factors, immune reactions leading to basement membrane damage and genetic factors. Diagnosis is based on medical history, physical examination and numerous additional tests. Among the tests which are used in the diagnosis, the most useful are: chest x-ray, computed tomography of the chest, bronchofiberoscopy and BAL. The disease due to its rare occurrence, uncharacteristic symptoms and the possibility of coexistence with other chronic diseases can cause many diagnostic, therapeutic and prognostic problems.
Aim of the study: Therefore, the aim of our study a case report of a girl, aged 16.5 years, hospitalized at the Department of Respiratory Tract Diseases for Children in Lodz because of hemoptysis.

Respiratory disorders of ALTE (apparently life threatening event) type and the possibility of differential diagnosis

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Introduction: Respiratory disorders in children are relatively frequent in the youngest age groups. For their objectification and differential diagnosis are used in various diagnostic procedures. As currently, it seems to be the most objective, polysomnography (investigation of physiological functions during sleep via system "online"). The most difficult diagnosis of these conditions is among the youngest children whose consequences can manifest as ALTE (apparently life threatening event – a condition which almost endangered the life). Since the second half of the 90-th of XX century, in the differential diagnosis of ALTE and SIDS (sudden infant death syndrome) prevention started to implement the differential diagnosis of these conditions and using polysomnography.
Material and methods: We followed 124 siblings of SIDS victims, 289 children with ALTE in whom we have carried out together over 460 polysomnographic examinations (Nightwatch system and Alice 3). Subsequently, we provide for 121 children, home apnea monitors at risk, with an assessment of their effectiveness. If indicated, we perform differential diagnosis during hospitalization in the clinic, including ENT, neurological, gastroenterological, cardiologic, metabolic and other examinations.
Conclusions: The differential diagnosis of apnea disorders even in the youngest children should be in indicated cases also use polysomnography which is available at specialized institutions in Slovakia. Using, it is possible, differential diagnosis of sleep apnea, conditions of ALTE and monitoring of therapeutic effects.

The role of lung ultrasound examination in the diagnosis of lung diseases

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The aim of this presentation is to show the usefulness of bedside ultrasonographic examination in daily clinical practice. Author presents advantages and disadvantages of method compared to other radiological examinations and shows a series of cases in which ultrasound examination contributed to setting the final diagnose.

Childbirth extra muros – tumor extra corporis

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Congenital defects of the chest wall present a large group of congenital anomalies. Some of them are less sever and affect newborns more often than other ones. A well-known chest wall anomaly is for example *pectus excavatum* deformity, which is usually mainly an aesthetic problem for affected patients. On the other hand, there is a severe congenital anomaly known as Jeune syndrome, which is often associated with pulmonary hypertension and cardiac and respiratory failure shortly after birth. In most of congenital defects of the chest wall its integrity is not compromised. In neonates, who were born with a defect of the chest wall, at first we most often consider diagnosis *ectopia cordis*, which is associated with other birth defects and severe overall clinical condition of the patient. In January 2015 was to University Hospital in Martin transported the term newborn born extra-muros, in regard to social conditions of patient there was not realized ultrasonography screening. After the birth of the child there was present some mass prolabing through the chest wall defect impressing as *ectopia cordis*, but the child surprisingly did not manifest adequate clinical symptomatology. In our case report we present a newborn hospitalized in Neonatology Clinic UNM and operated by pediatric surgeons of Department of Pediatric Surgery UNM for unusual congenital malformation of the chest wall, and we present briefly overview of current informations about this anomaly.

Hyper IgE syndrome leading to the destruction of lung tissue

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This is a case of 19 years old girl with progressive destruction of lung parenchyma in Job's syndrome. Job's syndrome, classified as primary immunodeficiency, is characterized by elevated levels of immunoglobulin E (IgE) in the blood serum. So far about 250 cases worldwide have been described. It is characterized by recurrent eczematous changes and abscesses of the skin, fungal infection of the skin and mucous membranes, and infections of the lower and upper respiratory tract. In our case, lesions occurred in the first month of life, and the nature of the disease was diagnosed in the 6th month of life. At the age of 7 the left-sided pleuropneumonia occurred complicated with bronchial fistula which was the reason for placing the child to the Department of Thoracic Surgery at Rabka-Zdroj.

The level of IgE was 1,130 IU/ml ERS: 55/80. By bronchoscopy – massive bilateral purulent secretions in the bronchial tree were seen. Bacteriologically MRSA *Staphylococcus aureus* was detected. In radiological examination the upper left lobe was changed. The left decortication was made with the right upper lobectomy. Histopathological examination showed multiple abscesses, partially purified. No evidence of innate nature of the changes.

The girl was treated prophylactically with Orungalem and Bactrim. She gets a regular substitution of Privigen 25 g *i.v.* every four weeks.

Recurrent respiratory infections wee the cause of subsequent hospitalization including two stays in the Institute. Despite FEV1% = 32, the girl does not declare dyspnoea.

Nasal FeNO in diagnosing primary ciliary dyskinesia

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Measurement of nasal fractional concentration of nitric oxide (nNO) is considered as a sensitive marker in differential diagnosis of primary ciliary dyskinesia (PCD), although the origin of low nasal NO values in PCD patient is unknown. We have measured nasal NO as well as FeNO from the airways in 42 patients with PCD (17 females, 25 males) aged 6-21 yrs using Ecomedics (Ecomedics, Switzerland) analyser. The measurements were made according to ATS standard: nNO with the use of nasal olive and FeNO at expiratory flow of 50 ml/s. Mean nNO in the group was 76.1 ±59.7 ppb; with the range from 14.10-333.6 ppb; while FeNO measured at the mouth with flow restrictor to eliminate NO from nasal cavities was 5.9 ±3.3 (range 1.5-15.0). The literature presents different cut-off levels for nNO: 200 or 300 ppb; in our material there were 2 patient having nNO > 200 and in one of them nNO exceeded 300 ppb. When taking into account FeNO with cut-off value of 10 ppb we found value above this threshold in 5 out 42 patients.
The measurements of nNO, although technically somehow more demanding and sometimes difficult, are much cheaper and less stressing to the patients than for example evaluation of ultrastructure of cilia in electron microscopy from specimens taken during biopsy or examining cilia acquired with brush bronchoscopy in terms of motility and beating frequency. It appears to be a useful tool in diagnosing PCD, however the existing overlapping with normal values obtained from control subjects may cause problems in about 10% of cases (according to literature). In our study this percentage was below 5%.

This work has been completed within "BESTCILIA" project.

Detection and tracking of movement of respiratory epithelium's cilia using differential method

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Automatic object's detection in a video sequence is an interesting part of computer vision which enables the objectification and accuracy of image segmentation based on particular object's motion. Most of basic detection algorithms use the subtraction of a reference image – usually image of static background – from all the images in the sequence. Method of Collins *et al.* also belongs to differential methods, however, it subtracts the previous and next image and after that it subtracts the current and next image and then the logical operation AND between the both partial results is performed. Such calculations are quite simple so the algorithm can be executed very fast. The fastness of detection method is its great advantage and enables the possible object's detection within the video in real time. Applied to problematics of respiratory epithelium's cilia, the proper detection of ciliary movement and the possibility of tracking the direction of their motion in particular moment, can markedly contribute to enhancement of the evaluation of patient's diagnosis.

Results of this work were supported by project VEGA 1/0165/14 – Pharmacological modulation of the frequency of respiratory epithelium's cilia movement and by *grant KEGA No. 003STU-4/2014 – Advanced image processing methods for visual systems and their implementation to educational process.*

Innovation of "Ciliary Analysis" software tool for better and much more convenient data evaluation

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The older version of software tool called "Ciliary Analysis", which serves for analysis of respiratory epithelium's ciliary cinematics, enables automatic selection of moving areas within images obtained by high-speed video cameras. Besides the detection of ciliary region, the software determines their frequency of oscillation, generates the frequency maps and calculates several parameters which indicate the relevance of detected regions compared to doctor-specialist. However, this tool so far has been used only for laboratory testing and confirmation of doctors' diagnosis and not in clinical practice for automatic and responsible enough assessment of patient's health state, yet.
Innovation of mentioned software tool proposes several additional modalities, which would improve the correctness of the detection algorithm. In order to make the tool handling much more convenient, it includes the possibility of loading the full database of patients sorted by the names or dates and their particular video records. The doctor can also display the frequency histograms which show how the values of frequency change in neighbouring pixels of the image. All this novel modalities provide better and more understandable data for doctor, which makes this innovated software not only more user-friendly, but also more sophisticated and accurate tool for proper analysis of respiratory epithelium's cilia and for complex diagnostics of ciliary pathologies.

Results of this work were supported by project VEGA 1/0165/14 – Pharmacological modulation of the frequency of respiratory epithelium's cilia movement.

Real-time frequency determination of moving respiratory epithelium's cilia

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The proper frequency of periodic motion is a key factor in evaluation of vitality of respiratory epithelium's cilia. Pathologic motility of cilia (e.g. too slow or desynchronized) underlies several diseases, which are connected not only with respiratory tract but with the overall health and most of them can be even fatal. This emphasizes the importance of precise patient's diagnosis based on quick and correct ciliary analysis. Already existing one and only analysing software tool within Slovakia is focused on post analysis and serves mainly for verifying and supporting the doctor's assumptions. In order to make this application really meaningful and helpful, we propose its betterment – an option of real-time momentary determination of frequency of ciliary motion. This will enable the specialist to assess the vitality and functionality of cilia right after the acquisition of respiratory tissue sample from patient's airways, which will prominently speed up the diagnostics of ciliary pathologies.

Results of this work were supported by project VEGA 1/0165/14 – Pharmacological modulation of the frequency of respiratory epithelium's cilia movement.

Diagnostic difficulties of ciliary dyskinesia. A case report

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2-year-old boy was admitted to the Institute of Tuberculosis and Lung Diseases in Rabka because of recurrent inflammations of the lower airways. Infections were accompanied by wet cough with expectoration of large amounts of mucus. Bronchoscopy revealed abnormal ciliary movement. Examination under an electron microscope showed normal ultrastructure of the cilia. The boy was treated by inhalation, despite recurrent infections no antibiotics were used for few years. In the fifth year of life irreversible changes of the pulmonary parenchyma were revealed by computer tomography. Finally, he required surgical treatment.

Characteristics of obstructive sleep apnea in children

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Introduction: Obstructive sleep apnea (OSA) is the most frequent sleep disordered breathing in a pediatric population. Recently it has been reported that delayed diagnosis of OSA can lead to neurobehavioural consequences and even serious cardiorespiratory morbidity, metabolic complications, as well as an increase in insulin resistance, high blood pressure and the development of OSA in adulthood.
The aim of our study was to compare and assess predictive factors in groups of paediatric OSA with the obstructive apnoe-hypopnoea index (AHI) in REM versus NREM sleep stage.
Results: The study included 94 Italian and Slovak children in age of 3-13 years, where as a result of PSG in children with sleep laboratory were 81 (86.17%) pediatric patients diagnosed with OSA (OAHI ≥ 1 apnea–hypopnoic obstructive type events/hour of sleep) with a median age of 5.25 years. In division of children with OSA on two sub-groups in relation to subtype obstructive respiratory events (NREM vs. REM OSA) (n = 57; 70.37% vs. n = 24, representing 29.63%) we recorded some clinical and polysomnographic differences between compared groups of children. Patients in the REM OSA group were older (5.91 vs. 5.08; $p < 0.05$), they had a significantly higher BMI (17.05 vs. 16.50; $p < 0.05$) and also in this group were significantly less children with symptoms ADHD ($p < 0.05$). These pediatric patients showed some characteristics similar to adult population with this syndrome.
Conclusions: Predominant pattern of occurrence of obstructive respiratory events during REM respectively NREM sleep appears to be an important factor in understanding the pathophysiology of OSA in childhood.

This work is supported by project VEGA 1/0262/14 "Zmeny architektoniky spánku a jej vzťah k aktuálnej a dlhodobej kompenzácii diabetes mellitus typ 1 v detskom veku".

Sleep architecture in children with obstructive sleep apnea

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Introduction: Obstructive sleep apnea (OSA) is a sleep disordered breathing in a pediatric population with a prevalence of 1-5%. Neurocognitive changes within the meaning of manifestations of hyperactivity and behavioral disorders which remind ADHD symptoms, failure to thrive, growth retardation, cardiovascular, and metabolic disorders belong to serious clinical consequences of OSA in children.
The aim of this study is to refer the impact of OSA in the pediatric population on the sleep architecture.
Results: In contrast to the adult population of this syndrome is not adequately documented the impact of the disease on the architectonics of sleep in children. The study included 94 children in age of 3-13 years, where as a result of PSG in children with sleep laboratory were 81 (86.17%) pediatric patients (56 boys; 59.57%) diagnosed with OSA (OAHI ≥ 1 apnea–hypopnoic obstructive type events/hour of sleep) with a median age of 5.25 years. In comparing the basic PSG sleep parameters of architecture was recorded lower percentage of NREM deep sleep (27.70% vs. 30.00%; $p < 0.05$), a greater percentage of the shallow sleep (10.40% vs. 4.70%, $p < 0.05$) and reduced NREM deep sleep efficiency (48.20% vs. 51.60%; $p < 0.05$) in children with OSA compared with a healthy control of children ($n = 13$; 13.83%). Children with OSA had also lower BMI (16.83 vs. 18.18; $p < 0.05$) and in this group of children, we also frequently reported symptoms similar to ADHD ($p < 0.05$).
Conclusion: Authors of this study imply the negative impact of OSA on the structure of sleep in children.

This work is supported by project VEGA 1/0262/14 "Zmeny architektoniky spánku a jej vzťah k aktuálnej a dlhodobej kompenzácii diabetes mellitus typ 1 v detskom veku".

Abnormal heart and breathing rate pattern during sleep in pediatric patients with a suspicion of Takayasu's arteritis – case study

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The 9 years girl was admitted to Institute for Tuberculosis and Lung Diseases for extended pulmonary diagnostics. Patient has proven history of pulmonary hypertension and epilepsy. High-resolution computed tomography (HRCT) revealed ground-glass opacities in the left lung. Steroid treatment reversed changes visible in HRCT and lowered blood pressure in pulmonary artery. After excluding other pulmonary diseases a preliminary diagnosis of Takayasu's arteritis was established (still unconfirmed). Patient reported episodes of several awakenings from sleep with fear and increased heart rate, so the full night polisomnography (PSG) was performed.
The number of breathing events was clinically insignificant (OAHI = 0.5 1/h, RDI = 2.3 1/h), oxygen saturation and carbon dioxide pressure was stable (mean SaO_2 = 95%, mean $tcpCO_2$ = 34 mmHg). During first half of the night we observed 26 episodes of increasing of the heart rate (from baseline at 90 bpm to over 150 bpm) and breathing rate (from baseline at 20-23 br/min to 28-32 br/min) which leads to awakenings from sleep. During starting phase of awakenings the pulse wave amplitude was notably attenuated for relatively long time (> 30 s) which could be recognized as a result of stress (fear). These incidents resulted in disturbed sleep structure – we staged only a short periods of deep sleep and REM sleep. In the middle of the night (2 : 20) the patient fall asleep for the rest of the night. During this period heart rate became constantly elevated (in the beginning 155 bpm at the end 109 bpm), breathing rate was also elevated (around 30 br/min). Sleep period between 2:20 and morning awakening had normal structure. According to the authors knowledge such pattern was not described before. It shows that increase in breathing frequency and heart rate (which is not fully explained) leads to arousals and awakenings with stress reaction. Such events disturb sleep structure and may resulted in daily symptoms. The normal sleep in the second half of the night is probably the result of increase of arousal threshold.

Anti TBC vaccine

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In Poland, according to the current vaccination schedule, BCG (Bacillus Calmette-Guerin) is to be done in the first 24 hours after birth in all neonates who have no contraindications.
The purpose of using the BCG vaccine is to reduce the incidence of TBC of severe course, such as meningitis and diffuse tuberculosis especially in children and adolescents.
Injection site after proper administration of the vaccine undergoes changes: the bubble about 6-8 mm in diameter, erythema, papule, ulceration until forming scar. There are also side effects observed local, nodal, distant and generalized, which are subject to the notification obligation.
It is appropriate to assess the immune system in the event in any case of late or systemic reactions after vaccination with BCG.
If there is a need to treat adverse events following vaccination with BCG one should be aware of the natural resistance of *Mycobacterium bovis* BCG to Pyrazinamidum.

Analysis of the incidence of TB in Slovakia in 2010–2015

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Despite a dramatic decline in the global incidence of TB in the last 100 years, we were recorded in the European region a 2.7% annual increase in cases in 2004–2009. This trend has stopped since 2010. There were infected about 9 million people all around the world and were registered 1.5 million deaths from TB in 2013, including 80 000 HIV – negative children, despite the fact, that it is treatable disease. TB occurs worldwide and up to 60% incidence is in South East Asia, Western Pacific and in Central Africa. It remains a serious problem of MDR – TB, which is very difficult to treat and presents 3.6% of all cases worldwide.

The situation in Slovakia nowadays is generally stabilized and we were recorded a decrease incidence in adults in all regions. Problematic are areas with highest incidence of TB in the long term – Prešov and Košice region. There is not the same situation in the case of pediatric TB, which in the last 5 years there was a 4-fold increase in the number of cases. The main problem is reinventing serious forms of TB – miliary TB, basilar meningoencephalitis, vertebrae TB, we start to meet with then in unvaccinated uniques. The second major problem is the increase in TB in the age group of 0-4 years. Over the past year also we recorded an increase in atypical non – tuberculous mycobacterial lymphadenitis. Whether that situation is the consequence of abolishing vaccination, other studies will show.

Key words: tuberculosis, incidence of TB, atypical mycobacterial infections, TB in Slovakia.

Tuberculosis in Poland

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Since 2010 y Poland is among countries with low incidence rate of tuberculosis. During last 10 years number of tuberculosis (TB) cases decrease from 9.269 (tuberculosis notification rates (24.3)) to 6.698 cases (17.4). The mean annual decrease of TB incidence in 2010-2014 was 2.1%
The number of all registered culture positive TB cases in 2014 was 4781 and constituted 71.4% of all TB cases and 72.9% of all pulmonary TB cases. The number of smear – positive pulmonary TB cases reported in 2014 was 2800 i.g. 7.3 per 100.000 respectively what constituted 44.4% of all pulmonary TB cases.
Tuberculosis was initial AIDS indicative disease in 13 persons.
There is large variability between voivodships from 9.3 to 26.5 per 100.000, among children (0-14 years old) in 2014 from 28 to 1 child. Tuberculosis in children represented 1.0% off all cases notified in Poland.
There were 532 (680) deaths due to tuberculosis reported in 2013 – 1.4 per 100.000. 518 people died from pulmonary and 14 from extrapulmonary tuberculosis. Mortality among males – 2.2 per 100.000 – was 3.6× higher than among females – 0.6. 38.5% of all TB deaths were cases 65 years old and older – 3.7 per 100.000. There were no deaths from tuberculosis in children. Tuberculosis was cause of death in one adolescent. TB mortality in 2013 constituted 0.14% of total mortality in Poland and 27.1% of mortality from infectious diseases.
In 2014, 59.3% cases of pulmonary TB were detected because of symptoms. Contact examination allowed detect 3.0% of these cases; other prophylactic examinations – 5.2%; all other methods – 32.5% (hospitalization due to different reasons, autopsy).

Evaluation of specific IgE prevalence in children using Polycheck (Biocheck) panel

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Introduction: Assay panels Polycheck (Biocheck GmbH) allow to study simultaneously up to 30 allergens in a small amount of blood.
Aim of the study: To evaluate the prevalence of a panel of specific IgE antibodies in children hospitalized in OT IGiChP.
Material and methods: The study included 2941 patients aged from 0.25 to 17.28 years (mean age 5.16 years), hospitalized in OT IGiChP between May 2014 and May 2015, in whom the concentrations of specific IgE (sIgE) by a panel assay (Polycheck-Biocheck, Germany) were assessed. Atopic panels (30 allergens) were used in 1090 patients, pediatric panels (20 allergens) in 958 patients, inhalation panels (20 allergens) in 734 patients and food panels (20 allergens) in 291 patients. Patients were categorized into the following diagnostic groups: skin allergy (atopic dermatitis, urticaria), allergic rhinitis (AR), asthma (divided into age groups – allergic march) and respiratory infections. In the analyses the prevalence (%) of positive sIgE in the above patient groups was calculated.
Results: In the atopic panel the highest prevalence of sIgE was found in AR and asthma groups for d1 (Der p; 38% and 28%, respectively), and for d2 (Der f; 31% and 26%, respectively). Similar prevalence of positive antibodies to mite allergens was found in inhalation panels (39% and 44%). In the asthmatic patients the prevalence of positive IgE antibodies to d1 increased with age from 5% (0-2 y) to 67% (14-18 y) – allergic march. In food panels the highest prevalence was found for skin allergy to peanut (f13) – 24%, apple (f49) of 20% and egg white (f1), 17%.
Conclusions: Panel determination of specific IgE allows fast, simple and inexpensive determination of antibodies to 20-30 allergens, and may be useful for the identification of the offending allergen.

Changes in acute phase inflammatory markers after antibiotic therapy in patients with cystic fibrosis or pneumonia

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Inflammatory markers were measured before and after 2 weeks of antibiotic therapy in 2 groups of patients bacterial inflammation, with cystic fibrosis (38 subjects) and pneumonia (9 children). Inflammatory markers included CRP, transferrine, ceruplasmine and haptoglobine. At the beginning, CRP and haptoglobine were increased in majority of patients (in 92% and 67% respectively). They decreased after antibiotic, but CRP were still high in 1/3 of patients in both groups and haptoglobine increased in 61% and 56% respectively. Ceruloplasmine levels were normal at the beginning and slightly increased after therapy (respectively in 47% and 33% of patients). We observed similar pattern for transferrin concentrations.
We conclude that CRP and haptoglobine are sensitive markers of bacterial inflammation, but not ceruloplasmine or transferrine levels.

Serological markers of infection by atypical pathogens in patients with IgM or IgG insufficiency

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Specific IgM level against *Mycoplasma pneumoniae* and total IgM were simultaneously measured in a sample of 1674 children with respiratory disorders.
Increased IgM levels against *Mycoplasma pneumoniae* were found in 95 children and there were 1579 negative results. According to predictive values used in our Institute, there were 23 children with low IgM level and 1651 children with IgM concentration within reference range. In a group of 23 children with IgM insufficiency, there were 2 positive results agains *Mycoplasma pneumoniae* (8.7%) and 21 negative. In a group of 1651 children with normal IgM levels, there were 93 positive results (5.6%) and 1558 negative (NS).
These preliminary results suggests that it is not necessary to measure total IgM level before measuring specific IgM against *Mycoplasma pneumoniae*.

What can hide behind a diagnosis of atypical cystic fibrosis?

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In our case report we present the case of 10-year-old Victoria monitored in the pulmonary clinic for atypical cystic fibrosis with pulmonary manifestations. Her difficulties has began already in the neonatal period when she overcame pneumonia and lung collapse. Since birth she has been suffering from recurrent respiratory infections – bronchitis, bronchopneumonia, rhinosinusitis. She has chronic cough and phlegm conditions persisting despite the complex mucolytic and bronchodilator therapy and rehabilitation. Victoria has a mild obstructive ventilatory defect, chronic hypertrophic pansinusitis and incipient bronchiectasis confirmed by CT scan and bronchoscopy. In this case report we provide an overview and conclusions of the investigations carried out under the differential diagnosis.

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Clinical picture of the children with transient hypogamaglobulinemia of infancy

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Introduction: Primary immunodeficiencies (PID) are a heterogeneous group of genetically-determined defects of immune system. Transient hypogamaglobulinemia of infancy (THI) is one of the most frequent PID in children with variable clinical presentation.
Material and methods: Altogether, 72 children with THI (42 boys – 59.2%, aged 3.38 ±2.82 years) were enrolled into the study. Clinical and laboratory characteristics were evaluated and association between different aspects were assessed.
Results: More than half of the patients suffered from the recurrent respiratory tract infections. The atopy was confirmed in 64% and more than half of them had positive family history for atopic diseases. Average age of the THI diagnosis establishment was 9.37 ±4.33 months with the correction of IgG levels to the normal values at the age of 31.65 ±15.73 months. Mean IgG concentration at the beginning of monitoring was 2.60 ±0.77 g/l. We were not able to detect any significant differences between the children with or without recurrent upper airways infections in IgG levels, however, the symptomatic children showed lower markers of specific cellular immunity and higher age of IgG normalization. Six children requiring immunoglobulin substitution had more pronounced deficiency of specific and non-specific cellular immunity and decreased specific post-vaccination response. We did not observe any septic complications or invasive infections.
Conclusions: Despite the general opinion that THI is mild immunodeficiency, significant proportion of children is symptomatic and usually suffers from respiratory infections. The clinical presentation of THI is modified by the specific and non-specific cellular immunity and by the gender. Symptomatic THI children require regular follow-up and adequate therapy.

Pepsin detection in saliva samples as a marker of extraesophageal reflux – our experience

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Clinical manifestation of gastroesophageal reflux disease (GERD) in children is very variable. Pathologic reflux can lead to inflammation of esophageal mucosa, what is presented by digestive symptoms. GERD in children is also manifested by extraesophageal symptoms – the most common by respiratory symptoms. The relationship between GERD and certain otorhinolaryngological complications has also been described. The reason is so-called laryngofaryngeal (or extraesophageal) reflux, which means the backflow of stomach contents into laryngopharynx and otorhinolaryngologic area. An aspiration event can also occure. Pepsin is produced only in the stomach, and thus when detected in the laryngopharynx, it is a specific marker for reflux. A simple test has been developed using monoclonal antibody to detect pepsin in expectorated saliva samples (Peptest, RDBiomed). We would like to share our experience with investigations of pepsin in expectorated saliva samples in correlation with 24-hour esophageal pH monitoring and clinical manifestations in children.
Key words: extraesophageal reflux, pepsin detection, expectorated saliva.

The role of PAR-2 receptors in allergic and inflammatory diseases of the airways

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In complex inflammatory processes one of the interesting and relatively less understood pathways is the one mediated by serine proteases, acting through activation of membrane receptors PAR (Protease – Activated Receptors). The sources of these proteolytic enzymes are both endogenous (mast cells and injured airway epithelial cells) and exogenous (common allergens like dust mites, pollen and fungi). Activated by them PAR receptors belong to the family of transmembrane G – proteine coupled receptors. Four types of PAR receptors have been identified so far, wherein particularly PAR-2, due to its presence on most inflammatory cells, plays a key role in allergic reactions and in the process of remodeling. Understanding the complex mechanisms of activation and inhibition of PAR receptors requires further studies and could be a strating point for new therapeutic options.

The clinical condition of children with GERD before and after antireflux therapy

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Gastroesophageal reflux disease (GERD) is present when the reflux of gastric contents causes troublesome symptoms or complications. Typical presenting symptoms of reflux disease in childhood vary with age and underlying medical condition. Symptoms and signs associated with reflux are mostly nonspecific and subjective symptom descriptions are unreliable in children younger than 12 years of age. The diagnosis of GERD is inferred when tests show excessive frequency or duration of reflux events, esophagitis, or a clear association of symptoms and signs with reflux events in the absence of alternative diagnoses. Management options for GERD include lifestyle changes, pharmacologic therapy, and surgery.

The project of this work was focused on the clinical manifestation of gastroesophageal reflux in children before and after treatment. Our study population consisted of 76 patients aged 3 to 13 years (median 8 years). We studied in details an overall clinical condition in pediatric patients with GERD (established by 24-hour pH monitoring). We evaluated the correlation between clinical manifestations and severity of GERD and also the effect of antireflux therapy in the time horizon of five years. We hope that a five year follow-up of a clinical status of pediatric patients with GERD will provide valuable information for further management of children with suspected gastroesophageal reflux disease.

Key words: gastroesophageal reflux in children, symptoms associated with GER, antireflux therapy.

It snows all the year

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Despite the advances in diagnostic tests, availability of inexpensive curative treatment, and the nearly universal use of the BCG vaccines, tuberculosis remains one of the three most important infectious diseases in the world in the terms of mortality and morbidity. WHO estimates that tuberculosis leads to 2 millions deaths and over 9 millions new cases annually. One million of these cases occur in children.
In 2012 ended the vaccination in Slovakia. This resulted to increase the incidence of new cases of TB. It also increased the number of serious diseases.
In my presentation, I will show you case of miliary form tuberculosis in severely hypotrophic 2-year old girl. There was affected respiratory, gastrointestinal and urogenital tract. Status was complicated with necrotising enterocolitis and disseminated intravascular coagulopathy. In-hospital also overcome appendicitis and peritonitis, which has been treated with surgical intervention.
Key words: children, tuberculosis, miliary form.

Oxidative stress and psychological component in the mechanisms of asthma in children

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Introduction: Asthma in childhood is significantly different from adults and has clinical features in each age period. In children, the disease is formed and develops against the background of the formation of neuro-endocrine-immune and respiratory systems. When excessive stress for the child (which is the fear of breathlessness in asthma) and chronic emotional states viscero-vegetative disorders form the typical clinical picture of asthma. It is conditioned pronounced "contribution" of biological factors (toxic-allergic inflammation) combined with anxiety caused by autonomic reactions. Hypoxia, as result of bronchospasm runs imbalance to free radical oxidation – antioxidant system (FRO–AOS), leading to accumulation of excess generation of reactive oxygen species (ROS) formation and oxidative stress. Oxidative stress and psychological component in the mechanisms of asthma are among the critical factors.
Aim of the study: Determine the level of personal anxiety, state of free radical oxidation and the generation of reactive oxygen species in children with controlled and partially controlled asthma.
Material and methods: Research design: 72 children with controlled and partly controlled asthma aged from 6 to 17 years, with a significant advantage in boys 70.8% (n = 51). Assessment production of reactive oxygen species was carried out by flow cytofluorimete laser, control of 5-18%. Determining the level of anxiety was carried out using the scale Spielberg-Hanin.
Mathematical processing of the data was performed using modern statistical applications of the software Microsoft Excel 2003 and StatSoft STATISTICA 8 using standard methods of variation statistics, correlation and factor analysis.
Results: Indicators of ROS in children with asthma slightly exceeded the performance of the control group and were 41.62 ±10.4%, ROS index also tended to increase with elevation severity of asthma. Discovered disequilibrium systems FRO-AOC on the following parameters: Superoxide dismutase (43.54 ±4.45 IU/ml erythrocytes), ceruloplasmin (419.31 ±126.64 mg/l), catalase (52.78 ±7%), SH groups (79.93 ±120%), malonic aldehyde (5.73 ±1 mkmol/l), diene conjugates (28.45 ±21 mkmol/l). The level of reactive anxiety was low in the vast majority of respondents (70%), moderate – in 27.5%, and high – only 2.5%. In contrast, reactive, personal anxiety was moderate and high (50% and 40%, respectively), and only 10% of children – low.
Conclusions: The imbalance of redox balance in asthma and emotional abuse of the child are important factors forming the disease and its course.

Nursing care of a child with extrapulmonary tuberculosis

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Tuberculosis is infectious disease caused by *Mycobacterium tuberculosis*. Main target organs are lungs,but mycobacterium can cause disease process in extrapulmonary organs as well. The most common localization of extrapulmonary tuberculosis are the lymph nodes, skin, bones, joints,meninges, peritoneum, gastrointestinal and urogenital tract, sensory organs.
Diagnosis of pulmonary forms of tuberculosis depends primary on epidemiological link, X-ray and tuberculin skin test, in extrapulmonary forms are for the diagnosis critical biopsy of the affected organ, histological examination and bacteriological proof.
Treatment of extrapulmonary tuberculosis in children is based on the same principles as the treatment of pulmonary tuberculosis.
The highest risk in nurses care is work with biological agents, and therefore are used specific measures to reduce the risk of exposure to biological agents at the department of tuberculosis and nursing care for pediatric patients with tuberculosis.
Patients with tuberculosis infection requires treatment by a multidisciplinary team, because the disease affects different structures of the body. Success of tuberculosis treatment requires strict compliance with the treatment and the nursing care.
The authors present the contribution of total nursing care on a two years old patient with extrapulmonary form of tuberculosis.
Key words: tuberculosis, extrapulmonary tuberculosis, nursing care.

Not all that wheezes is asthma – case presentation of Allgrove syndrome

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Allgrove syndrome is a rare autosomal recessive disorder characterized by alacrima, achalasia, adrenal insufficiency. Most patients develop neurological abnormalities. It is caused by mutation in the AAAS gene, located on chromosome 12q13.
We'd like to present a 6-year-old boy, the first child born to nonconsanguineous healthy parents. His 2-year-old brother exhibits no medical problems. Patient was born by vaginal delivery at term with congenital pneumonia, weighed 3270 g, APGAR 3/5/8.
Patient manifested neurological problems during early childhood. He demonstrated motor retardation and began walking at age of 2. Pes planus was documented. He was noticed to have nasal voice and alacrima. Because of recurrent upper airway infections and hypertrophy of adenoid the adenoidectomy and tonsillectomy was performed (VIII 2013). Since then he demonstrated recurrent lower respiratory tract infections and asthma was diagnosed (IX 2014). He received inhaled corticosteroids and beta-mimetics without improvement. He also presented autonomic abnormalities of the pupils (anisocoria), atrioventricular block I°, left-sided muscular weakness, periodic febrile body temperature.
Since II 2013 patient developed dysphagia to lumpy foods, swallowing difficulty and vomiting were present. He was malnourished and apathetic. He underwent an upper gastrointestinal contrast study and endoscopy (2014) without any conclusive results.
Patient was referred to the Department of Immunology at IP CZD on July 20, 2015 with suspected immunity deficiency. On admission he presented obstructive bronchitis. He soon developed aspiration pneumonia. The contrast study confirmed achalasia. Patient was operated on (27.07.2015).
After analyzing all the information the Allgrove syndrome was suspected. The genetic tests will be performed.