Bronchiolitis: aetiology, pathophysiology and therapeutic management

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Acute viral bronchiolitis in young infants remains a cause of substantial morbidity and health care costs. It is the most common lower respiratory tract condition and the most common reason for the hospitalization of infants. A number of respiratory viruses have been associated with acute viral bronchiolitis although respiratory syncytial virus (RSV) remains the most frequently identified virus. The majority of affected infants have a mild self-limiting disease, while others have more severe illness and require hospitalization and,sometimes,ventilatory support. Bronchiolitis has an overall mortality rate of 0.2-0.5%, with 99% of deaths occurring in developing countries.

Bronchiolitis is a clinical diagnosis based on a typical pattern of rhinorrhoea, cough, poor feeding, tachypnoea, subcostal recession and auscultatory findings of wheezing and fine inspiratory crackles. There is a distinct seasonal pattern with a peak in incidences in autumn and winter.

Evidence-based reviews have suggested a limited role for diagnostic laboratory or radiographic tests in typical cases of bronchiolitis. A nasopharyngeal aspirate has been identified as the most sensitive methodfor virus detection. Pulse oximetry also provides valuable information about the severity of the disease and guides subsequent management.

Supportive therapy remains the major treatment option, as no other specific treatments to date haveshown to provide clinically significantbenefits. Minimal handling, oxygen supplementation, and appropriate fluid management (including nasogastric feeds if necessary) are the mainstay of therapy. Nasal suctioning can be helpful as well. Very young infants may require cardiopulmonary monitoring for apnoea. There is a wide variation in treatment for bronchiolitis, which has led to the development of evidence-based clinical practice guidelines for treatment. Bronchodilators are inconsistently used and have been advocated for certain subgroups of infants. Several large, recent trials have revealed a lack of efficacy for routine use of either bronchodilators or corticosteroids for the treatment of bronchiolitis. Preliminary evidence suggests a potential future role nebulized hypertonic saline.

Key words: bronchiolitis, infants, respiratorycondition.

The role of *Mycoplasma Pneumonia* infection in child wheezing disorders

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The study was aimed to evaluate the role of the specific serologic diagnosis of *Mycoplasma* infection and clinical peculiarities of bronchopulmonary diseases with recurrent episodes of wheezing in children.

Seventy-six children (ages 6 months to 7 years) with wheezing disorders (bronchial asthma and obstructive bronchitis) were included in our study. The diagnosis, classification of asthma, and asthma severity levels were based on GINA guidelines. The determination of *M. pneumonia* and *M. hominis* IgG, IgA, IgM antibodies were performed by using an enzyme-linked immunosorbent assay (Human, Germania).

Analysis of the serologic examination results showed that 56 patients had the *Mycoplasma* infection and 20 exhibited no signs of *Mycoplasma* infection. In I group (the *Mycoplasma*-positive group) 4 patients had bronchial asthma, and 6 patients with obstructive bronchitis had specific antibodies in diagnostic titers (IgM 0,35±0,01 (cut-off 0,25), IgG 0,33±0,13 (cut-off 0,30±0,03) and IgA 1,47±0,01 (cut-off 0,801), IgG 1,18±0,46 (cut-off 0,33±0,02) accordingly). In the remainder of the first group (47 children), 10 children had b\ronchial asthma and 36 children had obstructive bronchitis associated with acute pneumonia. Levels of specific antibodies consisted of: *M. pneumonia* (4 children) IgM 0,29±0,02 (cut-off 0,25), IgG 0,47±0,02 (cut-off 0,32) and *M. hominis* (4 children) IgA 0,25±0,15 (cut-off 0,24), IgG 1,03±0,25; cut-off 0,3±0,01 and in 2 children a mix infection (*M. hominis* and *M. pneumonia* IgG 0,80±0,2 (cut-off 0,28) and IgG 0,50±0,07 (cut-off 0,33) accordingly*)* (in the group with pneumonia and bronchial asthma) and *M. pneumonia* 0,45±0,06 (cut-off 0,34), IgG 0,44±0,02 (cut-off 0,35) and *M. hominis* IgM 0,34±0,09 (cut-off 0,30), IgG 0,97±0,17 (cut-off 0,29) (in the group with pneumonia and obstructive bronchitis).

In II group (the *Mycoplasma*-negative group) 4 patients had obstructive bronchitis and 16 children had pneumonia, including 6 children with associated bronchial asthma and 10 patients had pneumonia with obstructive bronchitis. The levels of specific antibodies was below the cut-off: *M. pneumonia* IgM 0,18±0,09 (cut-off 0,52±0,15), IgG 0,17±0,02 (cut-off 0,33±0,03), *M. pneumoniae* IgM 0,1±0,02 (cut-off 0,25), IgG 0,14±0,02 (cut-off 0,27) and in last group IgM 0,1±0,04 (cut-off 0,25) and IgG 0,17±0,04 (cut-off 0,29) accordingly.

The Evolution of pneumonia in children with *Mycoplasma* infection was complicated in 11 cases: in 6 cases with pleural effusion and in 5 cases with atelectasia (patients from the *Mycoplasma*-negative group had pleural effusion only in 2 cases).

Mycoplasma infection in children with obstructive bronchitis and bronchial asthma is a significant risk factor, thus the identification of this infectious agent is important for the development of efficient programs of treatments in pediatric pneumology.

Key words: *Mycoplasma pneumonia,* wheezing disorders, children.

Cystic fibrosis (mucoviscidosis) in children

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Cystic fibrosis (CF) is a monogenic autosomal recessive disorder with a chronic progressive evolution, which determines an abnormal production of viscous secretions from the glands of exogenous excretion, and characterized by chronic obstructive pneumopathy, chronic diarrhea, malnutrition and malabsorption syndromes.

Respiratory symptoms onset in CF patients usually starts early – 80% in the first year of life with recurrent bronchitis, mostly with severe obstructive syndrome, latent persistent pneumonias, pulmonary and non-respiratory complications development. CF is also characterized by the installation of chronic obstructive pulmonary disease, which manifests itself by wheezing, prolonged expiration, persistent cough during respiratory infectious episodes which has latent evolution, nocturnal exacerbations, paroxysmal and exhausting evolution. Bronhoobstructive syndrome is develops al the level of the small bronchi and is conditioned by the viscous, sticky secretions and infective bacterial component. Expectorated secretions are abundant, purulent, in cases with progressive evolution haemoptysis may develop. In long-term evolution children develop progressive respiratory failure. The progressive evolution of the disease is conditioned also by resistant bacterial agents (*S.aureus*, *Ps aerugenosae*, *H. influenzae*), which accelerates destructive processes of the lung parenchyma and contribute to the expansion of the pulmonary fibrosis phenomena, and development of complications in the lungs (pneumothorax, atelectasis, bronchiectasis, bullous-distrophy, lung abscess, haemoptysis, asphyxia, calcinates in lungs, pulmonary hypertension and pulmonary heart disease).

Chest deformity is a clinical expression of the severe pulmonary pathological process: thoracic cage expansion, dorsal kyphosis, hypertrophic pulmonary osteoarthropathy (in schoolage children) which causes chest pain, bone brittleness (fragility), swelling, and hydrarthrosis. Chronic persistent severe hypoxia determines the presence in CF children of fingers hippocratism.

ENT disorders at children with CF are presented by the nasal polyposis, sinusitis and chronic rhinitis, transmission deafness.

The prognosis is reserved, with high risks of death in cases with severe neonatal onset. Currently the disease may have a stable evolution, if favorable circumstances are present: early diagnosis, efficient treatment with digestive enzymes, control of pulmonary infections, respiratory kinesiotherapy.

Key words: cystic fibrosis, children, etiology, clinical features, complications, management.

Pathogenic mechanisms of bronchial asthma phenotype in schoolchildren

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The aim of the study was the assessment of total immunoglobulin E (IgE) in children with different phenotype of bronchial asthma.

This study included 122 schoolchildren (aged 6-12 years) with bronchial asthma, including 37 schoolchildren (30.3%) with intermittent asthma, 39 children (32%) with persistent mild asthma, 33 children (27%) with moderate persistent asthma, and 13 children (10.7%) with severe persistent asthma. The values of total IgE were evaluated by the immunoenzymatic method. The results were statistically processed in *Epi Info 3.5* program.

The definition of the severity of bronchial asthma phenotype in 122 schoolchildren revealed allergen-induced bronchial asthma in 70.5% (86 schoolchildren); virus-induced bronchial asthma – in 7.4% (9 schoolchildren); bronchial asthma induced by physical effort – in 6.6% (8 schoolchildren) and unresolved asthma – in 15.6% (19 schoolchildren). The total IgE concentration was higher in schoolchildren with allergen-induced bronchial asthma (400,3±42,4 ME/ml) in comparison with IgE values in virus-induced bronchial asthma (45,9±3,9 ME/ml, $p<0,001$), in asthma-induced by physical effort (37,9±3,9 ME/ml, $p<0,001$) and in unspecified asthma (28,5±3,3 ME/ml, $p<0,001$). In this work we revealed significant correlation between the total serum IgE