Tian Jie[a], Xing Shen[a], Geng-Sheng Yu[a], Yong-Hong Bai[a], Jing Zhu[b], Guan-Xin Liu[b], Yuan Chen[a]
[a]Children's Hospital, Chongqing Medical University, Chongqing, China; [b]Pediatric Research Institute, Chongqing, China

OBJECTIVE: The objective of this study was to explore the influence of implanted mesenchymal stem cells (MSCs) on cardiac function, structure, and electrophysiology in rabbits with dilated cardiomyopathy (DCM).
METHODS: Thirty-eight rabbits were randomly assigned to 3 groups: (1) normal rabbits (n = 12); (2) rabbits with DCM cell implantation (n = 13); or (3) DCM control rabbits (n = 13). Adriamycin was applied to create the rabbit DCM model. Rabbits for cell transplantation received an intramyocardial injection of MSCs. Four weeks later, heart function morphology and electrophysiology changes were observed. The expression of cardiac Troponin T and connexin 43 was investigated through immunohistochemistry.
RESULTS: Compared with normal rabbits, the cardiac function of DCM rabbits was impaired, but this impaired function was improved by MSC implantation. The value for monophasic action potential amplitude and the maximum velocity in ¡°0¡±phase decreased significantly in DCM rabbits, whereas the value for 50% monophasic action potential durations (MAPD) and 90% MAPD were increased significantly. The effective refractory period increased also. The comparison of both DCM groups showed that the prolongation of MAPD was shorter in the cell implantation group than in the DCM control group, and no after-depolarization was observed, whereas early after-depolarization was recorded in 2 rabbits in the DCM control group. Histology analysis showed that the structural abnormalities in the cell implantation group were less than those in the DCM control group, and the implanted MSCs could express cardiac Troponin T and connexin 43.
CONCLUSIONS: Implanted MSCs can improve heart function, reduce the structural abnormalities, and possibly inhibit the progression of electrophysiologic derangement.

Pulmonology

DIAGNOSIS OF AIRWAY MALACIA VIA VIRTUAL BRONCHOSCOPY

Submitted by Nemat Bilan

Nemat Bilan, Zinat Miabi, Melli Saiiah
Department of Pediatrics, Children Hospital, Tabriz University of Medical Sciences, Tabriz, East Azarbaijan Province, Iran

INTRODUCTION: The term "malacia" refers to softness; in medical terminology, it refers to weakness of bone or cartilage. Laryngomalacia is the most common congenital abnormality of the larynx, and the patient may experience recurrent aspiration. Tracheomalacia refers to tracheal weakness and usually causes airway collapse as a result of cartilage defect. Bronchomalacia describes the weakness and collapsibility of 1 or both main bronchi. All of these diseases can be diagnosed by bronchoscopy, but this method is invasive and may interfere with the diagnosis. Furthermore, it is intolerable in young individuals who are severely ill and in patients with coagulopathy.
OBJECTIVE: This study was conducted to examine the role of virtual bronchoscopy in the diagnosis of laryngotracheobronchomalacia.
METHODS: In a periexperimental study during 3 years (November 2003 through October 2006), 35 patients who had clinical signs and symptoms of airway malacia were surveyed via virtual bronchoscopy.
RESULTS: The percentage of boys and girls was 65.7% and 34.3%, respectively, and the mean age was 3.7 ± 1.6 months. The result of virtual bronchoscopy for laryngomalacia, bronchomalacia, tracheomalacia, laryngotracheomalacia and laryngobronchomalacia was 42.8%, 25.7%, 20%, 8.5%, and 2.9%, respectively.
CONCLUSIONS: Virtual bronchoscopy, because of its noninvasive character, its speed imaging, and its excellent ability of assessment of airway stenosis can be considered as a substitution for bronchoscopy.

IDIOPATHIC PULMONARY HEMOSIDEROSIS IN CHILDREN: A ROMANIAN EXPERIENCE

Submitted by Catalina Bulucea

Catalina Bulucea[a], Dinescu Sorin[b]
[a]University of Medicine and Pharmacy, Pediatric Department, [b]Emergency County Hospital, Epidemiological Department, Timisoara, Romania

INTRODUCTION: Idiopathic pulmonary hemosiderosis (IPH) is a rare disease with unknown cause and variable outcome. It is characterized by recurrent episodes of severe hypochromic anemia, alveolar bleeding, and typical radiologic findings.
OBJECTIVE: The objective of this study was to develop an early diagnosis of IPH with real therapeutic benefits.
METHODS: We conducted a multicenter, retrospective, and prospective study using patients who were admitted to 3 Romanian pediatric clinics between 1984 and 2006. Secondary causes of pulmonary hemosiderosis were excluded.
RESULTS: Fifteen patients received a diagnosis of IPH during a 22-year period (1984–2006). The symptoms started at a mean age of 6.8 years (range: 9 months to 13 years), with a mean delay of 2.4 years before diagnosis. From the beginning, all patients had anemia, and only 6 children presented with pulmonary symptoms as well.

The classical triad (anemia, hemoptysis, and pulmonary infiltrates) was found from early in the disease in only 4 patients. The majority of patients' disease was diagnosed by bronchoalveolar lavage, and 3 were diagnosed at necropsy. Eight patients died in a period of 1 to 3 years from the diagnosis. The clinical course was variable: treatment with corticosteroids alone was not effective because 12 patients continued to have recurrent bleeding. Three patients who received immunosuppressive agents had a better outcome.

CONCLUSIONS: IPH is a severe condition with variable prognosis and has a better outcome when diagnosis is made at an early age. We believe that it is necessary to include in the screening of any severe, recurrent, hypochromic anemia a well-interpreted chest radiograph and to look for hemosiderin-laden phages in bronchoalveolar lavage.

BLOOD LEVELS OF INTERFERON γ IN NEWBORNS AND CHILDREN WITH OR WITHOUT RESPIRATORY PATHOLOGY

Submitted by Juan Peuchot
Juan Peuchot, Paula Prebianca, Maria Valeria Contrera, Angel Cedrato
Hospital Eva Peron De San Martin, Buenos Aires, Argentina

INTRODUCTION: There is evidence that long-term exposure to bacterial endotoxins at an early age is related to a protective effect for the development of allergic sensitivity. The endotoxin would be a powerful inductor of type I cytokines. Interferon γ (IFN-γ) would regulate the production of type II cytokines. There would be an increase of interleukin 4 and a decrease of IFN-γ in the airway and peripheral blood.

OBJECTIVE: The objective of this study was to determine in blood the levels of IFN-γ, immunoglobulin E, and eosinophil count in newborns and children with or without recurrent wheeze.

METHODS: Fifty-one newborns were recruited. The sample was processed through enzyme-linked immunosorbent assay method to determine levels of IFN-γ. In addition, 53 children with or without recurrent wheeze were recruited as well as 53 healthy children.

RESULTS: A total of 157 patients divided into 3 groups were analyzed. Group A: 51 newborn patients; group B: 53 patients who had recurrent wheeze and were aged 4 to 10 years; group C: 53 patients who had no history of wheeze and were aged 4 to 10 years. The average value of IFN-γ in children with a history of wheeze was 0.48 UI/mL. They had average values of immunoglobulin E of 7.89 and eosinophils of 9%. Children without history of wheeze had average values of IFN-γ of 0.91 UI/mL; newborns had average values of IFN-γ of 1.10 UI/mL.

CONCLUSIONS: IFN-γ could be used as an early diagnostic marker in atopic diseases.

INTRAVENOUS MAGNESIUM FOR TREATING ACUTE EXACERBATIONS OF ASTHMA IN CHILDREN: A SYSTEMATIC REVIEW

Submitted by Oliver Rackham
Oliver Rackham, Fauzia Paize
Arrowe Park Hospital, Wirral, United Kingdom

INTRODUCTION: Inhaled bronchodilators and systemic corticosteroids are the mainstay of treatment for acute exacerbations of asthma. A systematic review of the use of magnesium has been published, but the results are incomplete and the recommendation is "weak."

OBJECTIVE: The objective of this study was to determine the effect of intravenous magnesium in children with acute asthma.

METHODS: Randomized, controlled trials were identified by searching the Cochrane, Medline, Embase, CINAHL, and ProQuest databases. Other sources were used to identify "gray literature." Randomized, controlled trials in which children with an acute exacerbation of asthma were treated with intravenous magnesium versus placebo were included. Data were extracted from the full papers, and methodologic quality was assessed using a scale from 0 to 5.

RESULTS: Six studies involving 215 patients were included. Hospital stay was reduced in the magnesium-treated group. The percentage improvement in the percentage predicted peak expiratory flow rate was 43.5% greater in the treatment group. Significant differences were also seen in the forced expiratory volume in 1 second (weighted mean difference: 74.5%) and the forced vital capacity (weighted mean difference: 64.5%). There was improvement in asthma scores in 3 of the 4 studies that reported this outcome. There were no clinically significant differences in vital signs. No major adverse events were reported.

CONCLUSIONS: Intravenous magnesium is safe and beneficial as adjuvant therapy in the treatment of children with moderate to severe acute asthma. Magnesium should be for children who have moderate to severe acute exacerbations of asthma that do not respond to nebulized β-2 agonist.

DIAGNOSTIC BRONCHOALVEOLAR LAVAGE FOR PULMONARY FUNGAL INFECTIONS IN CRITICALLY ILL CHILDREN

Submitted by Malak Shaheen
Maged Ashraf[a], Alyaa Kotby[a], Malak Shaheen[a], Hadia Basim[b], Ahmed El Masry[c], Mervat Mansour[a]
[a]Pediatric Department, [b]Clinical Pathology Department, and [c]Pulmonology Department, Ain Shams University, Cairo, Egypt

IDIOPATHIC PULMONARY HEMOSIDEROSIS IN CHILDREN: A ROMANIAN EXPERIENCE

Catalina Bulucea and Dinescu Sorin

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