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Inside this issue: Paediatric lung disease

Predictors of symptoms are different from predictors of severe exacerbations from asthma in children.

Authors: Wu AC, Tantisira K, Li L, *et al.*

Reference: Chest 2011;140:100-7.

URL: http://chestjournal.chestpubs.org/content/140/1/100.abstract

Comments: In this paper, the authors performed a post-hoc analysis of the 'Childhood Asthma Management Program (CAMP)' study, a multicenter clinical trial of 1,041 children randomized to receive budesonide, nedocromil or placebo (as-needed beta-agonist). They found that the demographic and laboratory predictors of having persistent symptoms (i.e. not on inhaled corticosteroids, lower FEV1/FVC ratio, lower PC20 on methacholine challenge) are different from predictors of severe asthma exacerbations (i.e. younger age, history of hospitalization or ED visit in the prior year, ≥3 days use of oral corticosteroids in the prior 3 months, lower FEV1/FVC ratio, lower PC20, and eosinophil count). The study also confirmed what is previously known; children with persistent asthma symptoms were more likely to experience severe asthma exacerbations. Severe asthma exacerbation in the study was defined as "an episode requiring ≥3 days of oral corticosteroids, hospitalization, or ED visit due to asthma based on self-report at study visits every 4 months". This study reinforces the idea that asthma control and asthma exacerbations are both important independent outcomes in clinical care and research.

Is respiratory viral infection really an important trigger of asthma exacerbations in children?

Authors: Lee SL, Chiu SS, Malik PJ, *et al.*

Reference: Eur J Pediatr 2011;170:1317-24.

URL: *http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3175036/?tool=pubmed*

Comments: Authors prospectively followed 114 Hong Kong children (aged 6-14 years) with asthma on regular inhaled steroid for 12 months. Children were examined "if peak expiratory flow rate decreased to below 80% of their baselines, if they met a predefined symptom score, or if parents subjectively felt them developing a cold". Physician diagnosed outcome of each episode was documented. 355 such episodes were captured and nasal swabs results for viruses (by PCR) were available in 166. Of these, 37% were positive for a virus (most common was human rhinovirus). The low virus detection rate was mainly attributed to improved personal hygiene and precautionary measures taken during respiratory tract infections in the immediate post-severe acute respiratory syndrome period. A key finding of this study was that virus detection rate between asthma exacerbations (32 out of 97 episodes, 34.8%) were similar to non-asthma respiratory illnesses (29 out of 79 episodes, 39.2%). Thus, while many asthma exacerbations are triggered by viral infections, viral infections do not always trigger asthma exacerbations. Why the same virus can trigger an asthma exacerbation, yet does not on other occasions remains unknown.

Nebulized budesonide added to standard pediatric emergency department treatment of acute asthma: a randomized, double-blind trial.

Authors: Upham BD, Mollen CJ, Scarfone RJ, *et al.*

Reference: Acad Emerg Med 2011;18:665-73.

URL: *http://onlinelibrary.wiley.com/doi/10.1111/j.1553-2712.2011.01114.x/full*

Comments: Although asthma guidelines do not recommend the use of nebulised budesonide in the treatment of children with acute asthma, some doctors continue to do so. In this double-blind, RCT of 169 children (2-18 years) with acute asthma presenting to a urban pediatric emergency department, a single 2-mg dose of budesonide inhalation suspension (compared to normal saline) did not improve short term outcomes (asthma score and vital signs at 2 hours, hospitalization rates). Children in both groups received other standard care (albuterol, ipratropium bromide and systemic corticosteroids). This study should convince doctors not to add nebulised budesonide in treating children with acute asthma as it is not only non-efficacious but is also associated with cost implications.

Continuous versus intermittent inhaled corticosteroids for mild persistent asthma in children: not too much, not too little.

Authors: Ducharme FM.

Reference: Thorax 2011;67:102-105.

URL: *http://thorax.bmj.com/content/67/2/102.long*

Comments: In this excellent editorial, Ducharme provides cogent reasons why the treatment option of intermittent use of ICS should not be standard yet (in response to Martinez et al's article in Lancet 2011;377:650 e7).

A systematic review and meta-analysis: tailoring asthma treatment on eosinophilic markers (exhaled nitric oxide or sputum eosinophils).

Authors: Petsky HL, Cates CJ, Lasserson TJ, *et al.*

Reference: Thorax 2012;67:199-208.

URL: *http://thorax.bmj.com/content/67/3/199.long*

Comments: This paper combined the 2 Cochrane reviews that evaluated the management of asthma in adults and children based on eosinophil inflammometry outcomes. There were six (2 adults and 4 children/adolescents) studies that utilised FeNO and three adult studies utilised sputum eosinophils. These studies had a high degree of clinical heterogeneity including the definition of asthma exacerbations, duration of study and variations in cut-off levels for percentage of sputum eosinophils and FeNO used to alter management. The paper concluded that tailoring of asthma treatment based on sputum eosinophils is effective in decreasing asthma exacerbations. However, in contrast to the recent ATS guidelines on use of FeNO, tailoring of asthma treatment based on FeNO levels was not effective in improving asthma outcomes in children.

Lower airway microbiology and cellularity in children with newly diagnosed non-CF bronchiectasis.

Authors: Kapur N, Grimwood K, Masters IB, *et al.*

Reference: Pediatr Pulmonol 2012;47:300-7.

URL: *http://onlinelibrary.wiley.com/doi/10.1002/ppul.21550/full*

Comments: In the bronchoalveolar lavage (BAL) of 113 children (median age 63 months, IQR 32-95) newly diagnosed (within 4 weeks) with non-cystic fibrosis (CF) bronchiectasis, the authors described that Haemophilus influenzae was the most commonly detected pathogen, n = 53 (47%). In contrast to adult studies, P. aeruginosa was rare; n=7 (6%) in children, while mycobacterial and fungal species were not detected. About 50% did not have a culturable bacteria present. Compared to children without infection in the BAL (defined as ≥105 cfu/ml), children with infection had higher total cell counts (610 vs. 280 x 106/L), neutrophil counts (351 vs. 70 x 106/L), and neutrophil percentages (69% vs. 34%). Study supports recommendations that in children with non-CF bronchiectasis, anti-pseudomonas antibiotics should not be first line therapy, unlike in adults.

Long term sequelae from childhood pneumonia; systematic review and meta-analysis.

Authors: Edmond K, Scott S, Korczak V, *et al.*

Reference: PLoS One 2012;7:e31239.

URL: *http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3285155/?tool=pubmed*

Comments: Authors of this paper systematically reviewed published papers on children pneumonia aged <5 years. Synthesis of data from 13 papers revealed that a major sequelae occurred in 5.5% (95% CI, 2.8-8.3%) of non hospitalised children and 13.6% (95%CI, 6.2-21.1%) of hospitalised children. The highest frequency of sequelae was found in those with adenovirus pneumonia but children hospitalised with no pathogen isolated also had a high risk (17.6%, 95% CI, 10.9-24.3%). The most common type of major sequela was restrictive lung disease (5.4%, 95% CI, 2.5-10.2%). There are major limitations with the data within this review and some studies with short term reviews were not included. However, the paper's findings are in concordance with several large epidemiological studies in adult that has described that a lower respiratory infection in early childhood is an independent risk factor for lower lung function in adults. The study also raises important questions about follow-up of children with hospitalised and non-hospitalised pneumonia.

British Thoracic Society guidelines for the management of community acquired pneumonia in children: update 2011.

Authors: Harris M, Clark J, Coote N, *et al.*

Reference: Thorax 2011;66:ii1-23.

URL: http://thorax.bmj.com/content/66/Suppl_2/ii1.long

Comments: This high quality updated guideline represents a review of new evidence for the management of community acquired pneumonia. This document incorporates material from the 2002 guidelines and supersedes the previous guideline document. In context of the above study, of interest, the guideline recommends that follow-up radiology is not required in children who are recovering and previously well, other than when round pneumonia, collapse or persistent symptoms are present. The guideline does not make any recommendation with respect to clinical follow-up of children with pneumonia.

A multi-centre study on chronic cough in children: burden and etiologies based on a standardized management pathway.

Authors: Chang AB, Robertson CF, van Asperen PP, *et al.*

Reference: Chest 2012;epub ahead Mar 29.

URL: http://chestjournal.chestpubs.org/content/early/2012/03/28/chest.11-2725.abstract?sid=9b16664c-bfe5-42ee-b086-b6943df493a7

Comments: In this multicentre (5 major hospitals and 3 rural-remote clinics) study, 346 children (mean age 4.5-yrs) newly referred with chronic cough (>4-weeks) were prospectively managed in accordance with an evidence-based cough algorithm. The study has conclusively shown that the top three aetiology of chronic cough in children (protracted bacterial bronchitis, asthma and 'resolved without specific treatment') is different to that in adults. Further, frequency of etiologies was significantly different in dissimilar settings (p=0.0001); 17.6% of children had a serious underlying diagnosis (bronchiectasis, aspiration, cystic fibrosis). The study highlights that children with chronic cough should be carefully evaluated (as 1 of every 5-6 children have a serious underlying condition) and, irrespective of setting and age, child-specific protocols should be used.

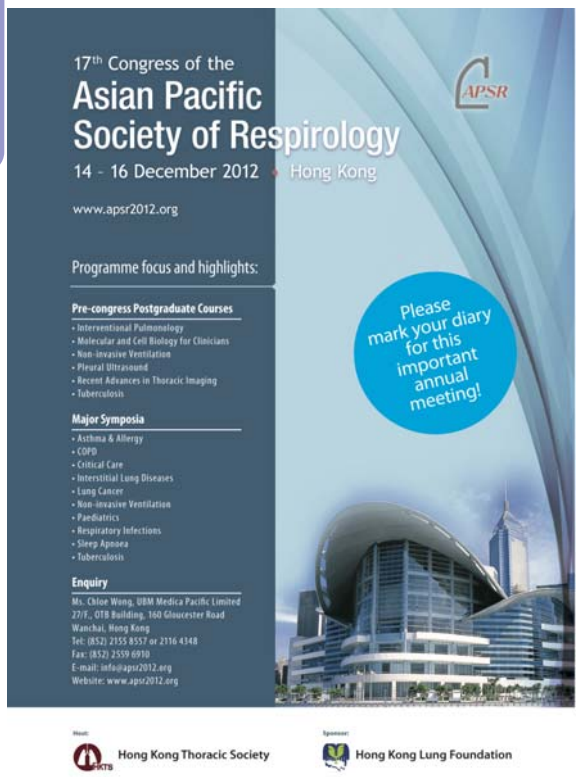
Viral and atypical bacterial detection in acute respiratory infection in children under five years.

Authors: Bezerra PG, Britto MC, Correia JB, *et al.*

Reference: PLoS One 2011;6:e18928.

URL: *http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3078930/?tool=pubmed*

Comments: This paper describes data from a prospective study of 407 children <5 years presenting with ARI over one year to a paediatric A&E department (Brazil). NPA and disease severity (grouped according to presence of lower respiratory tract signs, need for hospital admission and oxygen) were examined in this large cohort. 17 common respiratory viral and atypical bacterial pathogens in NPA were examined and pathogens were detected in 85.5% samples with co-infection commonly detected (39.5%). Respiratory Syncytial Virus (RSV; 37%), Adenoviruses (AdV; 25%), rhinoviruses (19%), bocavirus (19%), human meta-pneumovirus (10%) and Mycoplasma pneumoniae (Mpp; 10%) were most prevalent. A key finding is that "detection and co-infection rates were similar in all severities and clinical manifestations of ARI apart from RSV, which was associated with more severe disease and specifically more severe cases of bronchiolitis, and Mpp, which was associated with more severe cases of pneumonia".



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http://www.apsr2012.org/Home.aspx

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