



# Abstracts of 12th Annual Scientific Meeting Hong Kong Society of Paediatric Respirioloogy

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### **Pandemic H1N1 2009 in children – public health aspects**

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Pandemic influenza H1N1 2009 affected children and young adults more than the other age groups, possibly related to the lower protective cross-reactive antibodies to this novel virus. Locally, children aged 5-9 years old had the highest attack rate. A UK study showed that the clinical presentation of pandemic influenza H1N1 2009 in children may be atypical with 41% not satisfying the case definition for influenza and 18.8% without fever. In Hong Kong, 11.8% of children aged <6 years had vomiting as one of the presenting symptoms. The hospitalization rate in Hong Kong is highest among children ≤5 years old. As of October 20, 22 (14%) cases out of 152 severe infection recorded in Hong Kong were younger than 18 years old. Twelve (55%) had at least one pre-existing medical condition / risk factor. Attending physicians and parents should watch out for warning signs for severe illness. Current public health strategies in Hong Kong include continued personal hygiene campaign, surveillance, investigation and control of institutional outbreaks, risk communication and vaccination. Pre-existing medical conditions and children between 6 months and 6 years old are both target groups for vaccination when vaccine is available.

### **Severe acute respiratory symptoms: just like SARS**

Professor Ellis Hon

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The first case of SARS was reported in China in

November 2002 and some 800 people died of the disease in the following months. In July 2003, the World Health Organization reported that the disease had been contained. The mortality rate for the virus is approximately 4%. The misleading abbreviation "SARS" was erroneously coined in 2003. The diagnosis of Severe Acute Respiratory Syndrome (SARS) was based on a clinical definition in that patients who had fever, respiratory symptoms (not necessarily severe) and with epidemiologic link were considered to have SARS. Patients clinically diagnosed to have SARS may or may not have the SARS-corona virus (SAR-CoV). Overdiagnosis led to stigmatization and inconvenience in the workplace or at school. Conversely, underdiagnosing the condition led to disease being unrecognised and the potential for pathogen to spread in the community. Imprecise definition therefore carries serious public health consequences. Subsequently, it was realised that the clinical features of many patients with SARS were neither "severe" nor "respiratory" in nature.

The WHO case definition of suspected SARS was: i) fever and ii) respiratory symptoms including cough and difficulty breathing and iii) close contact with SARS patients or history of travel to an epidemic area. Aetiological diagnosis was not required in the clinical definitions. Any child in an epidemic area who had a "cold" with fever and cough could be diagnosed as SARS by WHO definition. The clinical features are essentially the same as that of many respiratory viral infections such as avian or swine influenza.

Respiratory viral infections cause significant morbidity and misery, affecting millions of children annually worldwide. Although most infections are short-lived and managed by the general practitioners, some children are seriously affected and require hospitalization. These



viruses account for a large workload in many of the pediatric departments in regional hospitals and are responsible for upper respiratory infections, croup, bronchiolitis and pneumonia. Among these hospital admissions, a small percentage of children would require Pediatric Intensive Care Unit (PICU) support. This presentation reports the clinical features and outcome of all children with a laboratory proven diagnosis of respiratory virus infection admitted to a university PICU. Every child with a laboratory-confirmed viral infection was included. Fifty-four viruses were identified in 49 children over a 52-month period. The three respiratory virus species, Respiratory Syncytial Virus (RSV) (n=17), influenza (n=13) and parainfluenza (n=12), accounted for 86% of these 49 cases. Comparing these three common viruses, the mean age of children admitted with RSV was lower than with influenza or parainfluenza. Pre-existing conditions such as prematurity and chronic lung disease were only present in children with RSV infection. These respiratory viruses caused both upper (croup) and lower respiratory tract diseases (bronchiolitis, pneumonia). Extrapulmonary presentations were less prevalent and included encephalitis, seizures, cardiac arrest, coexisting diabetes ketoacidosis and acute lymphoblastic leukemia. One patient with RSV and another with influenza A died during their PICU stay. Nearly half of these patients required ventilatory support or received systemic corticosteroids, and 88% received initial broad spectrum antibiotic coverage. Approximately one in five of them had nebulised adrenaline, airway endoscopies or bacterial co-infections. Adenovirus was isolated in 4 patients and two (both with adenovirus type 3) died during the PICU stay. We concluded that respiratory viral infections were associated with significant morbidity and life-threatening conditions.

With heightened awareness of infectious diseases in the post-SARS era, many new surveillance guidelines and confusing abbreviations appeared. A brand new abbreviation "ILI" was introduced to mean influenza like illness. The definitions for many of these abbreviations are nearly identical, if not the same as the clinical

definition of SARS (i.e. contact + fever + respiratory symptomatology +/- other symptoms). This can be unnecessarily confusing. Indeed, the only difference between ILI, influenza, avian flu, swine flu and SARS is the virus, and all may result in Acute Respiratory Distress Syndrome (ARDS)!

Applying the initial clinical definition of SARS to avian or swine influenza, these patients all had SARS, because their symptoms and epidemiologic links were just like SARS. However, the term SARS is no longer used unless SARcorona virus is isolated from the patient, regardless of whether "severe respiratory" symptoms and epidemiologic links are present. We will be seeing outbreaks of severe acute respiratory infections with epidemiologic links from time to time. Although SAR-CoV is out and may never come back, the SARS concept of index surveillance, epidemiological and prognostication studies is here to stay. SARS is very much alive among us.

### Flu and pneumococci

Dr. Daniel Ng

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Today, the world is faced with the novel H1N1 pandemic that affect mainly children and young people. Various measures have been taken to decrease the impact of pandemic on the human society. Co-infection with other viruses or bacteria are common in children with flu infection. Significant morbidities or mortality arise from this co-infection. Evidence emerged from studies of mortality cases in the Spanish flu epidemic in the last century that pneumococci contributed to the mortality. The flu virus denude the respiratory epithelium, increase expression of receptor for pneumococci as well as suppressing immunity. Hence, vaccination against pneumococci would be an important tool in reducing the impact of H1N1. For children with H1N1 infection complicated by pneumonia, empirical treatment should include appropriate antibiotics against pneumococci.



### **Orthodontic management in obstructive sleep apnoea**

Dr. Kim Sam

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Orthodontic appliance is one of the treatment alternatives in treating adult obstructive sleep apnoea. Evidence is well documented from both international and local data. Local data supported that although it is less effective when compared with CPAP, orthodontic appliance is still a good treatment choice for adult OSA with improvement in AHI, ESS, arousal index and oxygen de-saturation level. Such appliance is also proven to be effective in some severe cases. Short term side effect is minor and long term skeletal and dental side effect is clinically insignificant after three years.

However, data of orthodontic appliance in treating children OSA is lacking. Orthodontist may play a role in treating those OSA children with dento-facial discrepancies. Narrow maxilla and mandibular retrognathism are recognized etiologies of OSA in some children. It is logical to assume that the correction of such underlined dento-facial discrepancies, could improve OSA problem simultaneously.

Narrow maxilla and mandibular retrognathism could be corrected by different types of orthodontic appliances and such skeletal changes had proven to have an enhancing effect in airway potency. Different types of orthodontic appliances will be discussed and stress will be placed on patient selection in such appliances.

### **Medical management of sleep apnoea – does it work?**

Dr. Tat-kong Wong

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Obstructive sleep apnoea in children is a common problem, with a prevalence of 2-5%. Most children suffered from moderate to severe sleep apnoea

in children can be successfully cured by adenotonsillectomy.

Treatment in cases of mild obstructive sleep apnoea with adenotonsillectomy is still controversial. Recent studies showed a definitive role of intranasal steroid and / or leukotriene inhibitor in this group of children.

Children with mild residual sleep apnoea after adenotonsillectomy have also been shown to improve significantly with treatment with intranasal steroid and / or leukotriene inhibitors.

In this presentation, we are going to discuss the available studies on the role of medical treatment and how we are going to apply that in our daily clinical practice.

### **Weight reduction for children with sleep apnoea – Kwong Wah Hospital experience**

Dr. Yuen-yu Lam

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Obesity is a worldwide health threat which is associated with long term morbidities and demanding the society with high medical cost. There is increase in prevalence of obesity in children worldwide, both in developed and developing countries. Compared with adult, the definition of obesity in children, assessment parameters and their implications with long term morbidities are less clearly defined. Nevertheless, there is evidence that obesity in childhood also carries long term risks in cardiovascular and metabolic morbidities.

Sleep apnoea is closely related to obesity in adults. In children, in addition to the well known contributing causes by large tonsils and adenoids to sleep apnoea, obesity was also found to be an important contributing factor. Even corrected for the effect of obesity, sleep apnoea in children was also found to correlate with cardiovascular and metabolic risk factors. The coexistence of both, obesity and sleep apnoea, in



children will pose them to high risk of long term complications. Adenotonsillectomy is a common operation used to treat sleep apnoea in children who have enlarged tonsils and adenoids. Obese children however have higher operative risks. It was also found that weight gain was frequently observed in children after adenotonsillectomy for sleep apnoea which may be due to the decrease in energy expenditure during sleep. The weight gain may increase the risk of recurrence of apnoea despite initial treatment success. Studies have shown that successful weight reduction may lead to resolution of sleep apnoea in morbidly obese children. It is therefore important to have good weight control in children with sleep apnoea, either as an initial strategy especially in mild case or children not fit for surgery. Weight control is also important after operation to prevent development of obesity and recurrence of disease.

In Kwong Wah Hospital, children with morbid obesity and sleep apnoea will undergo weight reduction program. A multidisciplinary approach is used with input from paediatric endocrinologist, sleep team, dietician, physiotherapist and clinical psychologist. Other specialists e.g. cardiologist and nephrologist may also be involved in those with additional complications. It is even more important to start weight reduction in obese children before any significant morbidities have occurred. The demand is high for weight reduction service for obese children. Previous experience of our hospital in running different community weight reduction programs for obese children sheds light to the direction of future planning in such service.

### **Surgical treatment of paediatric sleep apnoea – beyond tonsillectomy and adenoidectomy**

Dr. Birgitta Wong

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Adenotonsillar hypertrophy is the leading cause of paediatric obstructive sleep apnoea. However there are

other causes of sleep-related breathing disorders in children especially in neonates and infants such as laryngomalacia, craniofacial anomalies in Pierre Robin Sequence and Treacher Collin Syndrome, congenital laryngeal problems, vascular malformations and neuromuscular disorders.

Laryngomalacia accounts for 80% of neonatal stridor. It is also the major cause of obstructive sleep apnoea in children younger than 1 year old. Fiberoptic endoscopy is used for diagnosis while laser aryepiglottoplasty is an effective surgical treatment for this condition. Assessment of rest of the airway can be performed by rigid laryngoscopy to rule out other congenital laryngeal problems like vascular malformation or vallecula cyst which can be treated by laser excision.

Craniofacial anomalies in children with Pierre Robin Sequence and Treacher Collin Syndrome often have severe obstructive sleep apnoea due to complex conditions such as micrognathia and hypoplastic maxilla. Distraction osteogenesis which involves moving the mandible and midface has become an acceptable major operation.

Nasal pathologies like choanal atresia and stenosis of the piriform aperture can cause obstructive sleep apnoea in neonates. Transnasal and transpalatal opening with endoscopic and powered instrument is the treatment choice. More commonly, nasal obstruction in children is caused by hypertrophic inferior turbinates. This problem has gained importance in sleep-disordered breathing. Medical treatment with steroid nasal spray is traditionally used. Nowadays, radiofrequency turbinectomy has been proven to be a safe procedure in prepubertal children.

Tonsillectomy and adenoidectomy is the cardinal treatment for paediatric sleep apnoea. However, we should be aware of other causes and surgeries as well. Successful management should be tailored and individualized.



## Update on the management of asthma in the young child

Professor Allan Becker

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### *"Children are not Little Adults"*

National and international guidelines for asthma have been produced since the late 1980s. However, until recently there has been little focus on the issues of asthma in childhood, particularly in young children. Recommendations for assessment and management of asthma in children were usually based on interpretation of data from studies in adolescents and adults. Our Canadian Pediatric Asthma Guidelines published in 2005 focused on the diagnosis of asthma in the young child. However, the consensus committee noted that there were insufficient data upon which to provide good quality recommendations for management of asthma in the preschool child. Recent updates of the Global Initiative for Asthma (GINA) included a specific focus on the young child with asthma but even there no consensus could be reached on management of children under two years of age.

There have been a number of cohort studies which have helped to define the "trajectory" of wheezing syndromes in early life. Data from the Tucson Children's Respiratory study have been most helpful in understanding these phenotypes. With the increasing recognition that asthma begins in childhood, there have been a number of important research programs which have focused on the young child with asthma. Data from a number of studies in infants, toddlers, pre-school and children have recently been published. Published data pertaining to several facets of asthma management in the young child are becoming available to help guide physicians in their approach to the management of asthma in the young child. Examples of this include recent publications on the use of intermittent inhaled corticosteroids in infants, use of intermittent montelukast in pre-school and school age children, attempts to alter the natural history of asthma by early introduction of inhaled corticosteroids in high risk children, new approach to use of combination

inhalers in children and direct comparison studies of the safety and efficacy of leukotriene receptor antagonists and inhaled corticosteroids in school age children.

Overall, these data will help us provide more effective management of asthma for young children and help guide development of future guidelines. Importantly, "Asthma Begins in Childhood" and outcomes in later life are determined early in childhood. The challenge we must promote among our colleagues is to identify asthma in the young child and to develop treatment strategies that have the potential to prevent or reduce long term adverse outcomes as the children reach their adult lives.

## Prevention of allergy and asthma: is it possible?

Professor Allan Becker

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There has been an epidemic of allergic diseases including asthma over the last four decades. Allergic diseases and asthma are considered to be chronic complex diseases driven by gene-environment interactions. Asthma is the most common chronic disease of childhood with population estimates approximating 15/100 young school age children. In parallel with the increase in asthma, we are also seeing an increase in other chronic complex diseases including diabetes (albeit at a very much lower prevalence of 15/100,000), inflammatory bowel diseases, multiple sclerosis, lupus and other autoimmune diseases. For many years, the relationship between allergy and asthma is well recognized. Individuals sensitized to house dust mite, cat or *Alternaria* have a significantly increased risk for the development of asthma. There have been a number of studies focused on prevention of allergy and asthma. Most studies have focused on a single environmental factor and a recent meta-analysis has demonstrated the lack of value of this approach. There are only a few multifaceted intervention studies of which the Canadian Asthma Primary Prevention Study



(CAPPS) is the largest and has followed children the longest time. CAPPS has been successful in decreasing asthma in high risk children but not in modifying allergic sensitization, atopic dermatitis, or food allergy through to 7 years of age.

It is increasingly important to recognize that the environment is complicated beyond the usual focus on allergens and tobacco smoke and represents being a much broader concept than we have previously considered. We must think beyond the "built" environment and biologic exposures to consider chemical exposures, nutrition of the pregnant mother and infant as well as psychosocial factors that may play an important role in modifying gene expression through epigenetic mechanisms. Prevention programs focusing on one specific trigger are unlikely to have any substantial affect. It is increasingly clear that any focus on the environment must include study of the physical, biological, chemical and social aspects to which we are all exposed. Environmental influences in utero and early life may well shape immune and physiologic function and may not easily be modifiable in later life. Allergic diseases, including food allergy, atopic dermatitis and asthma are most common chronic diseases of childhood and often present early in life. As such, observational and prevention studies of allergic diseases and the underlying immune (dys) function may help us understand the impact of the environment and our genes at the population level as well as the potential for the development of other chronic diseases.

### **A practical approach to management of allergic eye conditions in children**

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Allergy eye symptoms are common in children worldwide. They are frequently associated with nasal allergy symptoms and may be under-diagnosed. This talk focuses on the practical aspects of pathophysiology of ocular allergy as well as their management. A range of strategies from allergen avoidance to pharmacological treatment and surgical treatment will be discussed. The

emphasis will also be on what a pediatrician can do prior to the point of referral: recognition of the ocular symptoms, recognition of potential sight-threatening situations, and effective initial treatment.

### **Daily versus intermittent therapy for recurrent wheeze in young children**

Professor Fernando Martinez

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Studies performed by our own group and others have shown that there are different wheezing phenotypes in early life. Moreover, regardless of the nature of the pathogenetic factors that determine wheezing, the majority of patients with typical wheezing (as compared with those with atypical wheezing) have recurrent episodes of airway obstruction, especially during the winter months. Between these episodes, and during the summer months, most children with recurrent wheezing during the preschool years show no clinical evidence of airway obstruction. This pattern of clinical presentation of asthma-like symptoms in early life has suggested the possibility that these heterogeneous conditions could be treated intermittently with either high doses of inhaled corticosteroids or with leukotriene receptor antagonists. However, results of clinical trials in which this strategy has been tested have provided contradictory evidence. In one study, very high doses of fluticasone were used at the first signs of upper respiratory illness and children thus treated showed less use of oral corticosteroid bursts than children using placebo. However, growth in height and weight was affected in children treated with the active drug. In another study, the proportion of episode free days was not different in children treated with either montelukast or budesonide at the first signs of an impending episode of airway obstruction. However, severity of each episode was lower in children using active drug compared with those using placebo. It also appears that children with risk factors for different wheezing phenotypes may show different responses to these as needed therapies. Further studies are needed to clarify the efficacy of intermittent use of anti-inflammatory therapies as compared with daily use of these therapies and the treatment of wheezing phenotypes in early life.