Case history

10-year-old girl with known asthma and allergic rhinitis developed sudden onset wheezing the evening before. The patient self-administered 6 puffs of salbutamol which did not improve her symptoms and was then taken to the emergency department. The girl had respiratory syncytial virus (RSV) infection at 15 months. She had 3-4 attacks of presumed upper respiratory tract infection (URTI) induced shortness of breath each year, and had one admission of moderate asthma attack two years before. Although discharged with inhaled corticosteroid, the parents did not adhere to the treatment recommendations due to concerns about steroid and western medicine usage. Instead oral traditional Chinese medicine was used on-and-off. Following admission, she was treated with salbutamol and atrovent nebulisation, intravenous hydrocortisone and oral azithromycin. However, response was unsatisfactory and she remained in respiratory distress with suprasternal and intercostal in-sucking. Reduced air entry and diffuse expiratory wheezes were audible. Chest radiography was shown (Figure). She was transferred to the paediatric intensive care unit (PICU) for management. Vital signs were: SaO₂ 95%, respiratory rate 40/min, heart rate 170/min, BP 113/58 mmHg, and temperature 37.8°C. Arterial blood gas showed pH 7.39, pCO₂ 5 kPa, and pO₂ 10 kPa with 2 L/min of oxygen via nasal cannula. She responded to intravenous magnesium sulphate and salbutamol infusion, and was discharged from the PICU 2 days later.

Question

1. Which of the following statements is true?
   a) Fever indicates pneumonitis and that the asthma attack is most likely triggered by pneumococcus pneumoniae.
   b) RSV is the most likely viral pathogen in this age group
   c) Pathophysiology is due to dead space ventilation
   d) Hypoxia is due to ventilation/perfusion mismatch with severe shunting
   e) Chest radiography is normal and shows no evidence of pneumonia or asthma

2. Which of the following statements is true?
   a) Her PaO₂/FiO₂ ratio is normal and there is no hypoxemia
   b) Her PaO₂/FiO₂ ratio indicates that she has acute respiratory distress syndrome
   c) Her PaCO₂ is normal and her asthma attack is not severe
   d) Perfusion is more affected than ventilation in this case
   e) Asthma is primarily a problem with airway resistance rather than compliance

(Answer on page 17)
my mentor, who is the division head of paediatric pulmonology at Ramathibodi Hospital, Faculty of Medicine, Mahidol University, Bangkok. She is also one of the international faculties of this meeting. She has kindly arranged the fellowship grant for me. I also attended the post-ASM home non-invasive ventilation workshop. In my opinion, this meeting is very attractive and admirable. As there are many world-famous speakers; Professor Carole Marcus, Professor Narong Simakajornboon, Professor Peter Le Søeuf, Professor Gary Wong, and Professor Clete Kushida. In addition, Hong Kong is not far from Thailand, only 2-hour flight, and the paradise for shopping and leisure.

On the 2nd day, I have attended many interesting programmes, start from the free papers in the morning. Professor Gary Wong then gave very impressive review about epidemiology of complicated pneumonia, particularly pneumococcal pneumonia and macrolide resistant mycoplasma pneumonia. The opening ceremony was a remarkable Chinese ritual that I have never seen before. After coffee break, I had attended all 4 topics of the Pulmonology symposium. The revolution in diagnostic lung imaging by Professor Peter Le Søeuf was the most innovative issue for me, what a very marvelous technology!! For childhood OSA, Professor Carole Marcus's lecture is always great. The Sleep symposium in the afternoon was comprised of the relevant topics, including approach to sleepiness, home CPAP knowledge, pathogenesis of nose in OSA, and the effectiveness of adenotonsillectomy. It provided the comprehensive knowledges on childhood OSA. The last lecture, triggers' for acute asthma by Professor Peter Le Søeuf was again impressive.

On the next day, at Kwong Wah Hospital, the post-ASM home non-invasive ventilation workshop was very advantageous, even I am not the sleep specialist. I had an opportunity to look around the hospital with Dr. Eric Chan and colleagues.

In conclusion, I would like to thank all faculties for organise this wonderful academic meeting that broaden horizon in the paediatric respiratory medicine.

Answers to X-ray Quiz on page 11

Question 1 (c) and Question 2 (e)

Asthma is a common childhood condition associated with atopy. Efficacious medications are available and include inhaled bronchodilator, corticosteroid and oral leukotriene inhibitor. Patient education and monitoring of compliance is pivotal in the management of this condition. However, treatment is often hampered by myths and fallacies leading to non-adherence. Asthma can be triggered by a number of factors including emotional stress, exercise, aeroallergen exposure, and acute respiratory viral infections, especially rhinovirus. Although RSV may cause wheezing episode in young children, it is not a common trigger for asthma attack in children. Unlikely pneumonia (with parenchymal involvement and reduced compliance), asthma affects the smaller airways (with increase airway resistance) and lead to ventilation perfusion mismatch with dead space ventilation rather than shunting. Blood gas monitoring is important in the management of severe acute asthma attack. A normal or high PaCO₂ often signifies a severe asthmatic attack with reduced ventilation. Understanding the pathophysiology and respiratory equations will aid the interpretation of blood gas and timely management of life threatening respiratory conditions.

References