

# Respiratory symposium report

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**ABSTRACT** This respiratory symposium focused on pleural disease, allergy and the new guidelines for oxygen delivery. The management of pleural disease is changing, partly due to safety concerns. For example, safer designs of the Seldinger drain are being developed and chest ultrasound is now recommended prior to siting an intercostal drain. Greater availability of medical and surgical thoracoscopy means there is less use of the Abrams pleural biopsy, although this has implications for the organisation and provision of services. British Thoracic Society guidelines advocate that doctors now prescribe oxygen including the mode of delivery and target oxygen saturations. The incidence and epidemiology of allergic conditions was presented. The incidence of allergic disease is rising and lifestyle factors such as exercise and obesity may be implicated. The remaining presentations focused on respiratory disease in relation to driving, osteoporosis and liver disease. Doctors have a role in alerting patients to the legal implications of their medical condition with respect to driving. Obstructive sleep apnoea/hypopnoea syndrome is increasing in incidence; it is a treatable condition but has implications for driving if untreated. Inhaled and oral corticosteroids use results in bone demineralisation and osteoporosis, which in turn results in increased fracture risk. Bisphosphonates are indicated for steroid-induced osteoporosis, and as this develops most rapidly on initiation of corticosteroid, bone protection should be considered when therapy is commenced. The symposium ended with a presentation of the two pathologically distinct vascular syndromes linking pulmonary and hepatic disease. Hepatopulmonary syndrome is associated with pulmonary venous dilatation, and can be treated with liver transplant, whereas porto-pulmonary hypertension is associated with pulmonary venous constriction and may respond to vasodilators.

**KEYWORDS** Allergy, driving, hepatopulmonary syndromes, osteoporosis, oxygen, pleural disease, thoracoscopy

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## SESSION I CONTROVERSIES IN PLEURAL DISEASE

Significant changes to the management of pleural disease have recently been advocated, some of these driven by safety concerns. The physician's perspective was presented by Dr Nick Maskell (Chairman of the British Thoracic Society Committee on Pleural Disease). The National Patient Safety Agency bulletin last year reported 12 deaths due to intercostal drain (ICD) insertion, with a further 15 cases of severe harm. All but one of these occurred with a Seldinger drain.<sup>1</sup> This has prompted change in practice from the blind insertion of chest drains to the routine use of ultrasound prior to ICD insertion. New Seldinger kits including safety guards and shorter dilators are being developed but are not yet in clinical use. Small drains (12 or 14F) are adequate in most cases.

Despite widespread use of the Abrams needle for pleural biopsies, it is clear that the experts regard this practice as outmoded and unnecessary. Better alternatives include radiologically guided pleural biopsy using delayed phase contrast computed tomography (CT), which, highlighting pleural abnormalities, has a higher diagnostic

yield than Abrams biopsy. Medical thoracoscopy services are becoming more widespread and have a good diagnostic yield (93% of cases in more than 22 studies involving 1,494 patients). Medical thoracoscopy has a much higher yield for diagnosing tuberculosis than Abrams biopsy (which has been the gold standard), with 79% sensitivity for Abrams, but 100% sensitivity for thoracoscopy.<sup>2</sup> Pleurodesis can be undertaken at the time of thoracoscopy.

Complications from talc pleurodesis are mainly reported in the USA, where traditionally finer/mixed talc has been used.<sup>3</sup> 'Trapped lung' refers to lung which fails to re-expand, usually due to either encasement of the visceral pleura or to proximal tumour. In one case series of patients with a malignant effusion, 'trapped lung' was reported in 27% of lung cancer patients, and 10%, 9.7% and 7.5% in breast, miscellaneous and gynaecological cancers respectively.<sup>4</sup> Trapped lung can be seen at the time of pleurodesis using a thoracoscopic method. For these cases, an indwelling pleural catheter (Pleurx or Rocket) can be inserted during the procedure and 40–50% of patients eventually self-pleurodesise with these.

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The surgeon's perspective of pleural disease was presented by Mr Alan Kirk (Consultant Thoracic Surgeon, West of Scotland Heart & Lung Centre, Golden Jubilee National Hospital, Clydebank). The advantages of surgical thoracoscopy over medical thoracoscopy include better analgesia, ability to inspect the whole pleural cavity as the lung is fully collapsed, ability to acquire more invasive biopsies of the diaphragm and lung, and adequate coverage of kaolin for pleurodesis. In one case series of 100 patients, admissions for aspiration or drainage ranged from one to 13 attempts, with a range of hospital admission from one to 26 days (median two days). Mr Kirk advised that patients should be referred for a diagnostic thoracoscopy (medical or surgical) after one failed attempt at obtaining a diagnostic from a blind pleural aspirate.

Indications for surgical management of pneumothorax, empyema and mesothelioma were then discussed. The indications for surgical management of pneumothorax are recurrent (a second episode of ipsilateral pneumothorax) or persistent pneumothorax, secondary pneumothorax (secondary to pre-existing lung disease such as emphysema or interstitial lung disease) and for social/occupational reasons, e.g. divers should be referred on first presentation. In the case of empyema, an early (non-viscous, non-loculated) empyema can be managed with an ICD, whereas an intermediate more viscous empyema will usually require treatment with video-assisted thoracoscopic surgery (VATS) with chemical lysis and debridement. A late empyema (thick and viscous, multi-loculated, where the lung fails to re-expand) will need treatment with surgical decortication in the long term.

Mesothelioma can be managed surgically by complete resection by a procedure known as extrapleural pneumonectomy (EPP). This achieves macroscopic clearance. The surgeon's role is currently mainly diagnostic and palliative as there is no evidence that EPP prolongs survival. This is still under investigation, however, and larger clinical trials are awaited. It is also thought that EPP can achieve better palliation of symptoms, particularly as local thoracic wall pain is a problematic symptom for mesothelioma sufferers. There was some discussion over whether diagnostic biopsy sites should be marked for irradiation as the guidelines suggest. Mr Kirk believes that irradiation should be undertaken on an individual patient basis when problems arise as the tracking of mesothelioma at a biopsy site occurs in approximately 10% of cases.<sup>5</sup> However, guidelines do suggest marking of biopsy sites, and it was Dr Maskell's opinion that larger biopsy sites (e.g. thoracoscopy sites) should be marked.

## SESSION 2

### DEBATE: 'HIGH CONCENTRATION OXYGEN SHOULD BE GIVEN TO PATIENTS PRESENTING WITH ACUTE SEVERE ILLNESS TO A&E'

Arguing for the motion was Dr Geoff Bellingan, Consultant in Intensive Care Medicine, University College Hospitals, London. British Thoracic Society (BTS) guidelines advocate the use of high-concentration oxygen with reservoir mask in critically ill patients and during resuscitation.<sup>6</sup> This is based on evidence that hypoxaemia increases inflammation and leucocyte adhesion in critical illness. In critically ill patients, mortality increases as  $\text{PaO}_2$  falls below 11 kPa.<sup>7</sup> There are no known studies in critical illness showing harm from administration of high-flow oxygen. In some conditions such as carbon monoxide poisoning and pneumothorax, high-flow oxygen accelerates recovery.

Arguing against the motion was Professor Tony Davidson, Consultant Respiratory Physician and co-chair of the BTS guideline for emergency oxygen in adults. The aim of emergency oxygen delivery is to correct hypoxia. High-flow oxygen can be harmful in conditions of chronic hypoxia (chronic obstructive pulmonary disease [COPD], severe chronic asthma, bronchiectasis, cystic fibrosis). Examples of harm resulting from high-concentration oxygen (in addition to hypercapnic respiratory failure) include absorption atelectasis, increased shunting, coronary vasoconstriction, and increased systemic vascular resistance. There is concern that the overuse of oxygen may delay appropriate respiratory intervention.<sup>8</sup> The Respiratory Care guidelines<sup>9</sup> recommend administration of oxygen if the  $\text{SaO}_2$  is  $<90\%$  (or  $\text{PaO}_2 < 8\text{kPa}$ ). British Thoracic Society guidelines recommend target saturations of 94–98% for most patients, and 88–92% for those at risk of hypercapnic respiratory failure.<sup>6</sup>

Both sides of the debate were in agreement that critically ill patients should be given high-flow oxygen. However, the final vote was very close and was 64% to 36% against the motion, perhaps highlighting the uncertainty surrounding management of those with suspected carbon dioxide retention prior to the availability of an arterial blood gas result to guide management. The key changes to practice highlighted in the guidelines involve administration of oxygen by emergency services and clarification of oxygen prescription by doctors. In patients known to have COPD, it is recommended that emergency services use oxygen saturations to guide oxygen administration, and ambulances now carry a 28% venturi mask. Prescription of oxygen by doctors should be clearly documented with the doctor identifying a target saturation range and mode of delivery.

### SESSION 3 LIFESTYLE AND ALLERGY

The R W Philip Lecture was given by Professor Sergio Bonini (Professor of Medicine, Second University of Naples, Italy). Allergic rhinitis was first described 130 years ago as a condition affecting the aristocracy. Allergy now affects more than one billion people worldwide, including 25–40% of the population in the Western world. The incidence of allergic disorders is increasing significantly.<sup>10</sup> In the Sydney Olympic delegation more than 10% of the athletes had asthma, 25% rhinitis, and 32% any allergic disease.<sup>11</sup>

Reasons for the ‘allergy epidemic’ are not clearly established. Climatic change with rising temperatures results in increased pollen levels and lightening has been found to increase pollen allergenicity.<sup>12</sup> There has been an increase in transport and pollution. Exercise in polluted areas versus green areas produces a reduction in the forced expiratory volume in one second (FEV<sub>1</sub>).<sup>13,14</sup> Asthma and obesity are both increasing dramatically. Higher body mass index (BMI) is associated with a higher incidence of asthma.<sup>15</sup> Seventy-five percent of severe asthmatics are obese. Longitudinal studies indicate that obesity may precede asthma.<sup>16</sup> There are genetic factors in common in that there are 8% shared genes in asthma and obesity. ‘Adipokines’ found in obesity are also inflammatory cytokines associated with asthma (Leptin, Il-6, TNF-alpha, TGF-beta, eotaxin and CRP).<sup>17</sup>

Three cases illustrating challenges in allergy management were presented. The first case entitled ‘Allergic to exercise?’ was presented by Dr Karen Mackenzie (Specialist Registrar, Royal Hospital of Sick Children, Edinburgh). This is the case of an eight-year-old boy with a medical history of eczema, who went on to develop sporadic episodes of shortness of breath, periorbital swelling and vomiting, often during exercise. He was diagnosed with allergy-induced anaphylaxis and had raised levels of IgE to pork. This case highlighted difficulties in diagnosing allergic trigger factors and problems of compliance with treatment, particularly when this involves the avoidance of certain foods and behaviours. It was noted that a proportion of anaphylactic reactions occur in the context of exercise.

The second case, ‘Eczema, asthma and a high IgE,’ was presented by Dr Edward Paterson (Specialist Registrar, Raigmore Hospital, Inverness). This patient had a history of skin eruption as a neonate. The dermatitis was associated with high IgE and was treated with topical steroids. He then developed recurrent perianal abscesses, and at the age of eight an arm abscess growing *Staphylococcus aureus* was incised and drained. Meanwhile, the histology of a neck mass showed granulomata and the patient was treated for tuberculosis. Following an episode of respiratory syncytial virus infection, he had persistent wheeze and was treated for asthma.

Immunoglobulin levels and neutrophil function were normal, but blood IgE was raised at 1,200 IU. He continued to have asthma with difficult-to-control eczema, and poor dentition was noted. At the age of 12, the patient re-presented with left lower lobe collapse and finger clubbing. Blood eosinophils were raised at  $2.9 \times 10^3$ . A CT scan confirmed left lower lobe collapse and bronchiectasis. Surgery for left lower lobectomy revealed an intra-lobular sequestration. The patient was diagnosed with Job’s Syndrome, an autosomal dominant condition comprising of dermatitis, abscesses, lower respiratory tract infections, craniofacial abnormalities, bone infections and fractures.

The final case, ‘Anaphylaxis probably’, was presented by Dr Pete Kewin (Specialist Registrar, Glasgow Royal Infirmary). A 25-year-old female athlete who had had an episode of anaphylaxis at the age of 15 and had asthma since childhood presented with stridor and loss of consciousness. She was treated in the intensive care unit, and had a further relapse on recovery requiring continuous positive airway pressure. On follow-up, she had an atypical flare on skin testing, tryptase levels were normal suggesting no systemic allergic reaction, and CI esterase levels were normal. The patient had further episodes of anaphylaxis with a total of five intensive care admissions, and on one occasion developed severe blistering urticaria. This case demonstrates a diagnostic and management problem. On discussion of the case it was felt not to be allergen-mediated, but possibly a complement disorder and serial testing was recommended.

### SESSION 4 HOW DO I MANAGE...?

#### *Respiratory issues and driving*

This session was presented by Dr Heather Major (Senior Medical Advisor, Driver and Vehicle Licensing Agency [DVLA], Swansea). Ninety-five percent of crashes have a contributory human factor. In the UK the onus is on the driver to notify/declare medical problems to the DVLA if they consider them to impact on driving. The doctor’s role should ensure the patients understanding that the condition may impair ability to drive, advise ceasing driving if appropriate, and explain the need to contact the DVLA. Obstructive sleep apnoea/hypopnoea syndrome (OSAHS) occurs in 1–5% of adult men and significantly increases the risk of an accident,<sup>18</sup> but this risk is reduced with treatment. Patients with untreated OSAHS will be refused a license by the DVLA. Patients awaiting sleep assessment should be advised not to drive if sleepy.

#### *Osteoporosis and corticosteroid treatment*

Osteoporosis in patients on oral and inhaled corticosteroids was presented by Dr Steven Gallagher, Consultant Physician, Southern General Hospital, Glasgow. Osteoporosis is a risk factor for bone fracture, not a disease. Oral corticosteroids are associated with a 1.6–2.1 fold increased risk of hip fracture, which depends

on the dose and duration of corticosteroid treatment. A bone density T score of  $<-2.5$  is associated with a 4.5-fold increased fracture risk. The use of the FRAX (World Health Organisation fracture risk assessment tool) website, <http://www.shef.ac.uk/FRAX/>, to calculate fracture risk was advocated. Patients with a significant fracture risk should be offered bone protection treatment without the necessity for bone density assessment. There is a six-fold increase in fracture risk with more than 2.5 mg daily of prednisolone. Bone loss is more rapid in the early stages of inhaled corticosteroid therapy. Bone protection should therefore be considered at the start of steroid treatment.<sup>19</sup> In patients over 60 years old, bisphosphonates should be co-prescribed with the first long term steroid prescription. The FRAX score<sup>20</sup> should be used to guide treatment. Alendronate and risedronate are gold standard treatments in glucocorticoid-induced osteoporosis.<sup>21</sup> Inhaled corticosteroid therapy is considered low risk for the development of osteoporosis, but if the duration of treatment exceeds five years, the overall fracture risk (FRAX score) should be assessed and treatment considered.

### Hepatopulmonary syndromes

This session was presented by Dr Andrew Bathgate, Consultant Gastroenterologist, Royal Infirmary, Edinburgh. There are two distinct vascular entities (one with dilated capillaries, one with constricted capillaries) and both are associated with liver disease. Hepatopulmonary syndrome (HPS) consists of hypoxia, clubbing and cyanosis and is associated with pulmonary venous dilatation.<sup>22</sup> Diagnosis is confirmed with whole body perfusion scan or contrast

echocardiogram. There is no effective medical therapy and 5–10% of patients are assessed for liver transplant.  $\text{PaO}_2$  less than 6 kPa is significantly associated with worse outcome and these patients should be referred for transplant early. Porto-pulmonary hypertension (POPH) is diagnosed on right heart catheterisation when the mean pulmonary artery pressure (PAP) is raised ( $>25\text{mmHg}$ ). It is associated with increased pulmonary vascular resistance and is independent of the cause and severity of liver disease. It is not reversible with transplant, but responds to vasodilators. Transplant should be considered if the mean PAP is  $<35\text{mmHg}$ . If the PAP is very high, prognosis is poor and transplant does not improve the outcome.<sup>23</sup>

### CONCLUSION

This symposium highlighted important changes in management of pleural disease, debated the recently updated oxygen administration guidelines and discussed the epidemiology and clinical management of allergy. Medico-legal advice for drivers with respiratory conditions, the management of steroid induced osteoporosis and finally, hepatopulmonary syndromes were discussed. The key themes of the day focused on the application of medical evidence to improve clinical practice, and the importance of multidisciplinary working to improve access to services.

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