Hot topics from the Assemblies

Tropism and innate host responses of a novel avian influenza A H7N9 virus: an analysis of *ex-vivo* and *in-vitro* cultures of the human respiratory tract

Authors: Chan MC, Chan RW, Chan LL, *et al.*

Lancet Respir Med 2013; 1: 534–542

Summary: Influenza A virus is one of the major pathogens that has been a worldwide threat for the past several years. Many studies have tried to produce efficient anti-influenza drugs or vaccines but have been unsuccessful due to the complex proteome of influenza A viruses. The recent emergence of a novel avian A/H7N9 influenza virus in China, in March 2013, again proved the complex proteome of influenza virus and the high possibility for emergence of life-threatening novel viruses. One recent study compared tropism and induction of the pathogenesis of the avian-origin human influenza A H7N9 virus isolates (A/Shanghai/1/2013 and A/Shanghai/2/2013), the highly pathogenic avian influenza H5N1, H7N7 viruses (2003) that infected humans, pandemic 2009 H1N1, and a low pathogenic duck H7N9 virus on *ex vivo* cultures of human samples (bronchus, lung, nasopharynx and tonsil) and *in vitro* cultures of primary human alveolar epithelial cells and peripheral blood monocyte-derived macrophages. The study revealed that both human H7N9 viruses infected predominantly type II alveolar epithelial cells and alveolar macrophages, as well as both ciliated and non-ciliated human bronchial epithelial cells, and replicated to higher titres in human bronchus and lung *ex vivo* cultures. The duck/H7N9 virus failed to replicate in either and human H7N9 viruses were less potent inducers of proinflamatory cytokines compared with the H5N1 virus. Taken together these results suggest that the novel H7N9 viruses are better adapted to infect and replicate in the human conducting airways and lower airways than other avian influenza viruses, including H5N1, and shows an important pandemic threat.

Reviewed by: Balachandar Selvakumar (Germany, Assembly 3)

Upper-airway stimulation for obstructive sleep apnoea

Authors: Strollo PJ Jr, Soose RJ, Maurer JT, *et al.*

N Engl J Med 2014; 370: 139–149

Summary: Continuous positive airway pressure (CPAP) is a highly effective treatment for obstructive sleep apnoea. Patients who are unable to tolerate CPAP or who have poor adherence represent a clinical problem as alternatives are significantly less effective.

This multicentre cohort study described the surgical implantation of an upper airway stimulation device in 126 patients with obstructive sleep apnoea who were non-adherent to treatment with CPAP. The primary outcome was the apnoea/hypopnoea index (AHI). The initial study did not contain a control arm (all patients received the intervention) but subsequently patients were randomised to withdrawal or continuation of the intervention.

The authors reported a decrease of 68% in the AHI in the initial phase. The AHI returned to baseline in the group who had the device withdrawn during the randomisation phase. Epworth Sleepiness Scores were significantly improved by the intervention. Despite the efficacy of the intervention, two patients had serious device-related adverse events requiring further procedures and a high proportion of patients had less serious adverse effects, such as temporary tongue weakness and discomfort.

This study provides an interesting new approach in patients with a difficult clinical problem because of poor tolerance of adherence to CPAP therapy.

Reviewed by: Christoph Gilson (France, Assembly 4)

Age-adjusted D-dimer cutoff levels to rule out pulmonary embolism: the ADJUST-PE study

Authors: Righini M, Van Es J, Den Exter PL, *et al.*

JAMA 2014; 311: 1117–1124.

Summary: D-dimer can be a very useful test to exclude pulmonary embolism in patients with a low/intermediate clinical probability. Its usefulness may be reduced in elderly patients because of a high baseline D-dimer level, potentially leading to over-investigation in this group using computed tomography pulmonary angiogram.

This study investigated the value of an age-adjusted D-dimer cut-off (age × 10 in patients >50 years of age, compared with a conventional cut-off of 500 $\mu g \cdot L^{-1}$). Patients with a D-dimer level between 500 $\mu g \cdot L^{-1}$ and their age-adjusted cut-off were not investigated and were left untreated with the primary outcome being the occurrence of thromboembolic events within 3 months of the decision not to treat.

337 patients had a D-dimer level between 500 $\mu g \cdot L^{-1}$ and the age-adjusted cut-off and only one of these patients was subsequently found to have a thromboembolic event. Using an age-adjusted cut-off permitted exclusion of pulmonary embolism in an additional 23.3% of patients (absolute number of patients 157 out of 673 who avoided investigation).

Overall this study provides strong clinical evidence for the use of age-adjusted cut-offs in patients >50 years of age and suggests that continued use of the 500 µg cut-off in the elderly may lead to over-investigation.

Reviewed by: James Stark (Ireland, Assembly 4)

Comparison of a new, modified lung ultrasonography technique with high-resolution CT in the diagnosis of the alveolo-interstitial syndrome of systemic scleroderma

Authors: Mohammadi A, Oshnoei S, Ghasemi-rad M

Med Ultrason 2014; 16: 27–31

Summary: Systemic scleroderma is a connective tissue disease characterised by excessive fibrosis in different organs and systems. Pulmonary involvement (fibrosis) is present in 70–100% of patients. High-resolution computed tomography (HRCT) is the gold standard method for diagnosis of systemic scleroderma-related interstitial lung disease. This study investigated the utility of a modified trans-thoracic ultrasound (TTUS) scoring system according to the comet tail sign (B-line artefacts) and compared it with HRCT findings in 70 consecutive

Hot topic articles are short (approx. 200 word) summaries of recent important articles in respiratory medicine written by Junior ERS members (aged 35 years and under). To become a hot topic author please contact James Chalmers, email: j.chalmers@dundee.ac.uk

patients with systemic scleroderma who underwent HRCT and TTUS examinations.

The role of TTUS in the diagnosis of pulmonary fibrosis consists of detection and quantification of the lung comet tail sign (B-line artefacts), which is generated by the reflection of the ultrasound beams from the thickened sub-pleural interlobar septum. The comet tail sign is present in alveolo-interstitial involvement in systemic sclerosis; it is generally not visible in normal lung parenchyma. The researchers examined only selective intercostal spaces (10 locations), the TTUS assessment was scored semi-quantitatively as 0 (normal; $\leqslant$5 B-lines), 1 (mild; 6–15 B-lines), 2 (moderate; 16–30 B-lines), and 3 (severe; >30 B-lines). Pulmonary involvement was identified and scored according to the Warrick score in HRCT images. To correlate the TTUS B-lines with HRCT findings, the results were expressed as a semiquantitative scoring: 0 (normal; 0 points); 1 (mild; <8 points); 2 (moderate; 8–15 points) and 3 (severe; >15 points). A significant positive correlation between TTUS and the severity of pulmonary involvement ($p<0.001$), (LR=74.36, $p<0.001$) was found. When compared with HRCT as the gold standard method, the sensitivity, specificity, and positive and negative predictive value of TTUS were 73.58%, 88.23%, 95.12% and 51.72%, respectively.

The modified TTUS comet tails scoring system could be a useful and rapid imaging modality in the assessment of the pulmonary involvement in patients with systemic scleroderma.

Reviewed by: Adam Tarnoki and David Tarnoki (Hungary, Assembly 6)

Effect of β blockers on mortality after myocardial infarction in adults with COPD: population based cohort study of UK electronic healthcare records

Authors: Quint JK, Herret E, Bhaskaran K, *et al.*

BMJ 2013; 347: f6650

Summary: Patients with chronic obstructive pulmonary disease (COPD) have an increased risk of cardiovascular disease and about one-third of the mortality in COPD patients is caused by cardiovascular disease (including myocardial infarction). Although it is known that β-blockers reduce mortality after myocardial infarction, in COPD patients these are not regularly prescribed because of the concern of side-effects.

Through linkage of a myocardial infarction database with a general practitioners database in the UK, mortality risks of COPD patients who were prescribed β-blockers after their first myocardial infarction were compared with those who were not prescribed β-blockers. COPD patients who were prescribed β-blockers had a significantly lower risk of dying after myocardial infarction (HR 0.50, 95% CI 0.36–0.69; median follow-up time 2.9 years). This was after extensive correction for confounders such as smoking, family history of cardiovascular disease and other drugs being used.

The study shows that prescribing β-blockers in COPD patients after their first myocardial infarction is beneficial for their survival. However, in current practice, use of β-blockers remains limited in COPD patients. We might rethink and prescribe β-blockers more often in COPD patients, although further evaluation of the safety might be necessary.

Reviewed by: Firdaus Mohamed Hoesein (The Netherlands, Assembly 6)

Thoracoscopic lobectomy is associated with improved short-term and equivalent oncological outcomes compared with open lobectomy for clinical Stage I non-small-cell lung cancer: a propensity-matched analysis of 963 cases

Authors: Stephens N, Rice D, Correa A, *et al.*

Eur J Cardiothorac Surg 2014; (In press doi:10.1093/ejcts/ezu036)

Summary: This study compares the surgical performance and oncological outcomes of video-assisted thoracoscopic surgery lobectomy (VL) with open lobectomy (OL) for stage I nonsmall cell lung cancer. VL was performed in 307 patients and OL in 656 patients. From the OL group, a cohort of 307 propensity score-matched patients (1:1 matching) was defined, whose preoperative features were similar to the VL group. In unmatched univariate analysis (307 *versus* 656), VL was associated with lower incidence of atrial arrhythmias ($p=0.001$), fewer major pulmonary events ($p=0.003$), lower overall morbidity ($p<0.001$), shorter chest tube duration ($p<0.001$) and shorter hospitalisation ($p<0.001$). VL was associated with a higher incidence of reoperation ($p=0.018$) and longer operative time (median 173 *versus* 160 min, $p<0.001$). These results were confirmed in univariate analysis of matched cases. VL remained associated with a lower incidence of postoperative atrial arrhythmias (12% *versus* 21%, $p=0.003$), lower major pulmonary events (9% *versus* 19%, $p=0.001$), overall morbidity (19% *versus* 37%, $p<0.001$), longer operative time (median 173 *versus* 159 min, $p=0.007$), shorter chest tube duration (median 2 *versus* 3 days, $p<0.001$), shorter hospitalisation (median 4 *versus* 6 days, $p<0.001$) and minor need for blood transfusions (7% *versus* 4%, $p=0.048$). As far as oncological outcomes are concerned, no significant differences in recurrence rate were found between the two groups. Although the VL group showed a better 5-year survival in analysis of unmatched patients (78% *versus* 68%, $p=0.007$), when only matched groups were compared there was no difference (VL *versus* OL 5-year survival: 78% *versus* 73%, $p=0.071$). In conclusion, in patients with clinical stage I nonsmall cell lung cancer treated in a high volume, experienced centre, VL was associated with reduced perioperative morbidity, shorter hospital stay and equivalent oncological outcomes compared with OL.

Reviewed by: Andrea Viti and Silvia Giarratana (Italy, Assembly 8)

In the last edition of Hot Topics from the Assemblies, a reviewer's name was presented incorrectly. Treatment of early-stage lung cancer detected by screening: surgery or stereotactic ablative radiotherapy was reviewed by Inês Neves and Gabriela Fernandes.