APSR RESPIRATORY UPDATES

Volume 6, Issue 4 **Newsletter Date: April 2014**

APSR EDUCATION PUBLICATION

Inside this issue: Pleural Diseases

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Simple aspiration and drainage and intrapleural minocycline pleurodesis versus simple aspiration and drainage for the initial treatment of primary spontaneous pneumothorax: an open-label, parallel-group, prospective, randomised, controlled trial.

Authors: Chen JS et al.

Reference: Lancet 2013; 381(9874):1277-82.

URL: http://www.sciencedirect.com/science/article/pii/S0140673612621709?via=ihub

Comment This open-label, parallel-group, prospective, randomised, controlled trial from Taiwan included 214 adults presenting with a first episode of primary spontaneous pneumothorax (PSP) with a rim of air >2 cm on radiographs and complete lung expansion without air leakage after pigtail catheter drainage. Patients were randomly assigned (1:1) to receive 300 mg of minocycline pleurodesis or no treatment (control group). The rate of recurrence of pneumothoraces at 1 year (primary endpoint) was 29.2% in the minocycline group (vs 49.1% in the control group, p=0·003).

This study highlighted that the recurrence rate of PSP >2cm is high. Simple aspiration and drainage followed by minocycline pleurodesis is safe and can reduce recurrence.

Breath-hold after forced expiration before removal of the biopsy needle decreased the rate of pneumothorax in CT-guided transthoracic lung biopsy.

Authors: Min LF. et al.

Reference: Eur J Radiol 2013; 82(1):187-90

URL: http://www.sciencedirect.com/science/article/pii/S0720048X12004494?via=ihub

Comment: Iatrogenic pneumothorax is a known complication of transthoracic lung biopsy and chest tube placement is sometimes indicated. This study was done to assess the effect of breath-holding after forced expiration before removal of the biopsy needle on pneumothorax. 444 patients were randomized to breath-hold and without breath-hold. Chest radiographs were performed at 4 hours, 24 hours and if clinically indicated. Fewer pneumothoraces (18 [8.2%] vs. 35 [15.8%]) but no significant difference in rate of chest tube drainages (2 [0.9%] vs. 4 [1.8%]) were noted with breath-holding compared with controls. Lesion size (longitudinal diameter) and depth of lesion (distance from pleura) were also independent risk factors for pneumothorax.

Influence of previous use of inhaled corticoids on the development of pleural effusion in community-acquired pneumonia

Authors: Sellare J et al.

Reference: Am J Respir Crit Care Med 2013 187(11): 1241-1248

URL: http://www.ncbi.nlm.nih.gov/pubmed/23590264

Comment: Although inhaled corticosteroid (ICS) in COPD have been associated with increased risk of community acquired pneumonia (CAP) they have been shown to be associated with decreased pneumonia related mortality and fewer pneumonia complications. The aim of this study was to assess if previous ICS use influenced the incidence of parapneumonic effusions. This single centre prospective observational study included 3612 consecutive patients with CAP of which 633 (17%) were on ICS therapy (COPD 54%, asthma13% and other disorders) before the diagnosis of CAP.

The incidence of parapneumonic effusion was lower in patients with ICS use compared to non-ICS patients (5% vs 12%; p<0.001). After matching for propensity scores, the use of ICS was still associated with a lower risk of parapneumonic effusion (OR 0.40; 95%CI 0.23-0.69; p<0.001). Interestingly pleural fluid analysis suggested less pleural inflammation in patients using ICS with lower levels of protein and lactate and significantly higher levels of pH and glucose. This is potentially due to a local anti-inflammatory effect in the pleura.

A clinical score (RAPID) to identify those at risk of poor outcome at presentation with pleural infection

Authors: Rahman NB et al

Reference: Chest 2013 doi:10.1378/chest.13-1558

URL: http://journal.publications.chestnet.org/article.aspx?articleid=1782172

Comment This study aimed to develop a clinical risk assessment tool to identify patients with pleural infection who are at increased risk of death. The RAPID score was constructed from data collected from the Multicentre Intrapleural Sepsis Trial (MIST)-1, n=411, and validated using patients (n=191) enrolled in MIST2.

Total RAPID score range 0–7

- **R - renal failure** Urea <5mmol/L =0, 5–8=1, >8=2
- **A - age** <50 years old=0, 50–70=1, >70=2
- **P - purulence** No = 1; Yes = 0
- **I - iatrogenic empyema** Hospital Acquired=1; Community=0
- **D - dietary factors** Albumin >27g/L =0 <27=1

A high risk RAPID score (>4/7) was associated with a significant increase in mortality (OR 14.1, 95%CI3.5-56.8; p<0.001) and an increased duration of hospitalisation. The RAPID score may allow for risk-stratification of patients with pleural infection at presentation and may be useful in particular circumstances eg clinical trial designs. As most patients are treated practically the same in pleural infection, the clinical utility of this tool in guiding initial management decisions remains to be seen.

The variables in the RAPID scoring system are indicative of the underlying general condition of the patient rather than the severity of pleural infection and highlight once again that death from pleural infection is related to the underlying host factor (eg age, multi-organ – including renal – failure and poor nutrition states).

Clinical outcomes of indwelling pleural catheter-related pleural infections: an international multicentre study

Authors: Fysh E et al.

Reference: Chest 2013 144(5):1597-1602

URL: http://journal.publications.chestnet.org/article.aspx?articleid=1705710

Comment: Infection is often the major concern that deters the use of indwelling pleural catheters (IPC) in the management of recurrent (especially malignant) pleural effusions. This largest (n=1021 IPC patients) review from 11 centres of patients showed that IPC related infection was not common (4.9%). The majority (94%) of cases were successfully managed with antibiotic therapy alone without requiring IPC removal. The overall risk of death from pleural infection was only 0.29%. In nearly half the cases (48%) Staphylococcus aureus was the causative organism whilst infections with gram-negative organisms were more often associated with need for long term antibiotic therapy. Pleurodesis developed in more than half (62%) of patients with IPC related pleural infection.

Successful use of indwelling tunneled catheters for the management of effusions in children with advanced cancer

Authors: den Hollander BS et al.

Reference: Pediatr Blood Cancer 2013 Dec 23. doi: 10.1002/pbc.24902

URL: http://onlinelibrary.wiley.com/doi/10.1002/pbc.24902/abstract

Comment: Although a small series of 8 patients, this is the first reported use of IPCs in pediatric oncology patients. Similar to adult patients, this study reported positive feedback from patients, families and the oncology service. Approximately 50% of patients achieved spontaneous pleurodesis. The mean survival time after IPC insertion was 101 days. IPCs were found to result in symptomatic relief and allowed all patients to be discharged home with relatively minor complications, suggesting IPC is an effective palliative treatment option.

Interplay of Th1 and Th17 Cells in Murine Models of Malignant Pleural Effusion

Authors: Lin H et al.

Reference: Am J Respir Crit Care Med 2014 Jan 10 [Epub ahead of print]

URL: http://www.ncbi.nlm.nih.gov/pubmed/24410406

Comment : This study employed murine models of malignant pleural effusion from metastatic colon and lung carcinoma cells. This study suggested that malignant pleural effusion (MPE) development could be promoted by IL-17 deficiency which was associated with short survival. MPE development could be inhibited by IFN-γ deficiency, possibly through effects on angiogenesis and proliferation of pleural tumour, as well as pleural vascular permeability. The authors also demonstrated in the murine MPE models that the differentiation of Th1 cells could be inhibited by IL-17 through suppressing STAT1 pathway; while IFN-γ was also able to inhibit the differentiation of Th17 cells via suppressing STAT3 pathway. This may provide an important target for future MPE research.

Pleural lavage cytology: Where do we stand?

Authors: Toufektzian L. et al.

Reference: Lung Cancer 2014; 83(1):14-22

URL: http://www.ncbi.nlm.nih.gov/pubmed/24238496

Comment: This review article summarized the recent data confirming the importance of pleural lavage cytology (PLC) performed pre- or post-lung resection in patients without accompanying effusion. Positive pre-resection PLC was associated with worse prognosis although the effects of post-resection PLC were mixed. Proposed management options for positive PLC include intraoperative intrapleural chemotherapy and adjuvant chemotherapy. In light of adverse impact of positive PLC on survival, proposals have been made to incorporate it into the TNM staging.

A diagnosis of malignant pleural mesothelioma can be made by effusion cytology: results of a 20 year audit

Authors: Segal A et al.

Reference: Pathology. 2013; 45(1):44-8

URL: http://www.ncbi.nlm.nih.gov/pubmed/23222247

Comment: It is often believed that cytological diagnosis is difficult for malignant pleural mesothelioma (MPM), as separation of benign, reactive and malignant mesothelial cells are difficult. This audit was performed in a tertiary centre with a particular interest in MPM. Over a 20 year period, pleural samples were received from 6285 patients; 815 had a diagnosis of MPM. Cytological examination of a pleural effusion specimen had been performed in 517 (63%) of these 815 patients. Definitive cytological diagnosis of MPM was made in 377/517 cases, resulting in an 'absolute' sensitivity of 73%. An additional 66 patients were diagnosed as atypical/ suspicious. There were no false positive diagnoses of malignancy; two patients with metastatic adenocarcinoma were initially diagnosed as MPM, prior to the availability of specific mesothelial markers, resulting in a positive predictive value of 99%.

In centres with experienced pleural cytologists, pleural fluid cytology can reliably establish the diagnosis of MPM in a significant number of patients without more invasive interventions.

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