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Title: Pleural irrigation trial (PIT): Standard care versus pleural irrigation, a randomised controlled trial in patients with pleural infection

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Body: Background: Pleural infection remains common with an increasing incidence and high mortality. Despite chest tube drainage and antibiotic therapy up to 30% of patients will die or require surgery. Case reports suggest that irrigation of the pleural space with saline may be beneficial but this has never been tested in the form of a randomised controlled trial Method: Randomised controlled pilot study comparing standard care plus saline irrigation, with best standard care alone, in patients with pleural infection requiring chest tube drainage, who had a residual pleural collection on baseline CT thorax. Primary outcome was percentage change in CT pleural volume from day 0 to day 3. Secondary outcomes included referral for surgery, hospital stay & adverse events Results: 65 patients approached, 38 randomised, 3 excluded. Saline irrigation resulted in significant reduction in CT pleural collection volume compared to standard care – Irrigation group 29.2% reduction (95% CI 16.2- 62) vs Standard care 13.9% (95% CI -4.1- 26.3) p<0.04. There was also a significant reduction in the need for thoracic surgery in the irrigation group 2/18 vs 9/17 p=0.01 (OR 9.0, 95% CI 1.6-51.9). No differences were seen in length of hospital stay or fall in inflammatory markers (CPR, WCC and procalcitonin). Safety profile of saline irrigation was good with no serious complications and similar adverse events between groups. Conclusion: Saline irrigation improves fluid drainage in pleural infection, leading to reduction in referral for surgery. This study now needs to be repeated as a large multicentre RCT using the hard endpoints of mortality and length of hospital stay.