

A phase I feasibility study in establishing the role of ultrasound-guided pleural biopsies in pleural infection (the audio study)

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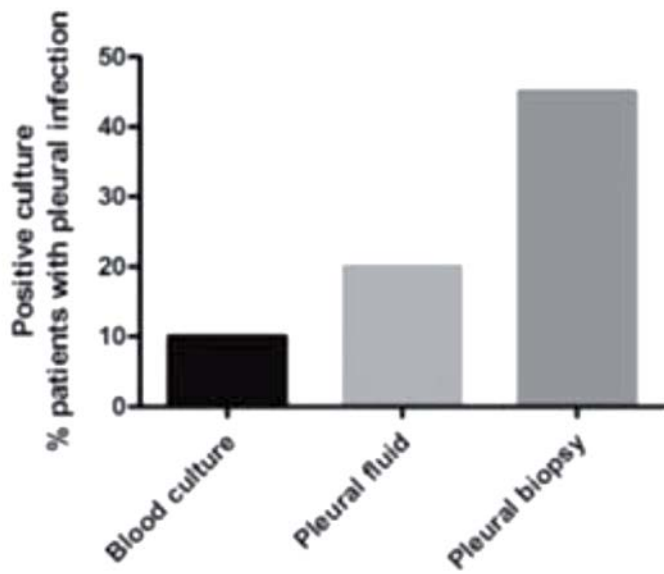
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Background Pleural infection is a common complication of pneumonia associated with high mortality and poor clinical outcome. Treatment of pleural infection relies on the use of broad-spectrum antibiotics, since reliable pathogen identification occurs infrequently. We performed a feasibility interventional clinical trial assessing the safety and significance of ultrasound (US)-guided pleural biopsy culture to increase the microbiological yield.

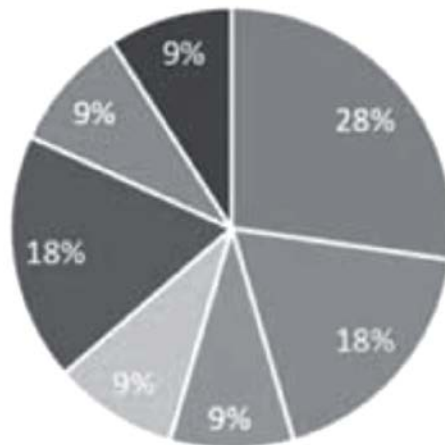
Methods 20 patients with clinically established pleural infection were recruited. Participants underwent a detailed US scan and US-guided pleural biopsies before chest drain insertion, alongside standard clinical management. Pleural biopsies and routine clinical samples (pleural fluid and blood) were submitted for microbiological analysis. In an exploratory sub-study, the 16S rRNA technique was applied on pleural biopsy samples, to investigate its' utility on increasing speed and accuracy versus standard microbiological diagnosis. This trials is registered with ClinicalTrials.gov, number NCT02608814

Findings US-guided were safe with no adverse events observed in this study. Pleural biopsies increased microbiological yield by 30% in addition to pleural fluid and blood samples (combined diagnostic sensitivity 55%). US characteristics at baseline were not statistically associated with survival, fluid volume drainage, radiological improvement or need for surgery. The 16S rRNA technique was successfully applied to pleural biopsy samples, demonstrating high sensitivity (93%) and specificity (89.5%).

Conclusion Our findings demonstrate safety of conducting US guided biopsies in patients with pleural infection and a substantial increase in microbiological diagnosis. qPCR primer assessment of pleural fluid and biopsy appears to have excellent sensitivity and specificity. Funding Oxfordshire Health Services Research Committee

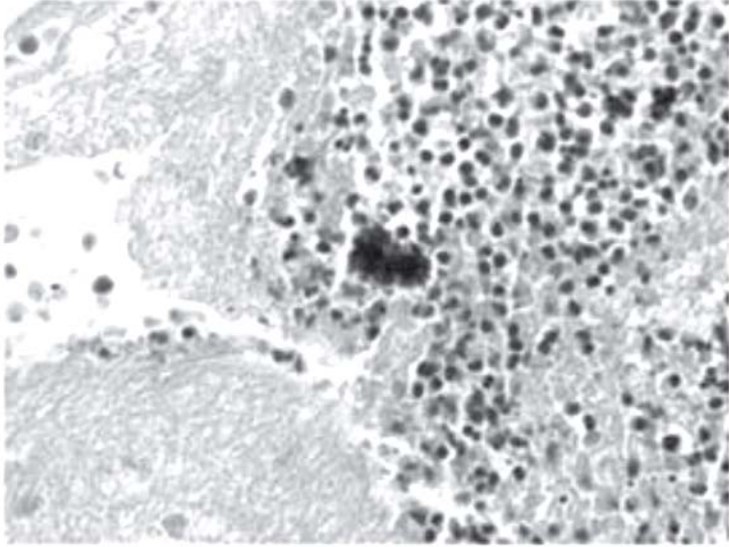


% increase on positive culture samples in patients with pleural infection



- *Streptococcus milleri*
- *Streptococcus intermedius*
- *Klebsiella pneumoniae*
- Anaerobes
- *Staphylococcus aureus*
- *Staphylococcus lugdunensis*
- *Staphylococcus Epidermidis*

Results of pleural biopsy culture



Gram stain of acute inflammatory exudate in a pleural biopsy showing small colonies of Gram positive cocci.