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Title: Does standardized medical treatment for parapneumonic empyema (PE) in children reduces the need for surgical intervention?

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Body: Treatment of PE consist of intravenous antibiotics and in case of large effusions and persisting fever pleural chest drain (\pm intra-pleural fibrinolytics) or surgical intervention (VATS). We standardized the treatment for PE in our tertiary care center choosing for a first step non-surgical approach. The aim was to have prospective data on outcome and need for surgery on all children treated between 2006 and 2013 for PE. Definition of PE and treating algorithm have been published (Proesmans, M. and K. De Boeck. Eur J Pediatr 2009; 168: 639-45). Data on median length of stay, duration of fever, complications and need for additional surgical therapy. Additionally, data on the causative infectious agents were studied. Results: 132 children were treated for PE. Median duration of 'in hospital fever' was 5 days (IQR 3-8) and median hospital stay was 13 days (IQR 8-17). The duration of fever was inversely correlated with pleural pH ($r = -0.28$; $p = 0.04$) and pleural glucose ($r = -0.34$; $p = 0.004$). The need for surgery dropped progressively from almost 40% in 2007 to 0% in 2010 again increasing to 40% in 2012. Overall, 20% of children needed surgical intervention. Based on pleural PCR data, 85% of PE were caused by S pneumonia (40% serotype 1). Pneumococcal antigen detection had a positive predictive value of 98% with a negative predictive value of 56%. Conclusion: Since 2006 all children with PE are strictly treated according to a standardized approach and outcome is registered prospectively. After an initial drop in the need for surgical intervention, the need for surgical rescue interventions increased again. This may be due to change in serotypes or disease severity.