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Title: Identification of bacterial pulmonary infection by a PCR based rapid molecular diagnostic assay in bronchoalveolar lavage

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Body: Rapid PCR based diagnostic tools have been developed to diagnose early bacterial sepsis. If there is a suspicion of pneumonia patients are usually empirically treated. Bronchoscopy with BAL is advocated in patients with nonresolving pneumonia. Bacterial PCR might allow to find bacterial pathogens in patients with nonresolving pneumonia under current treatment. In a pilot-study we analysed the diagnostic yield of a new PCR- and microarray-based rapid molecular diagnostic assay (Prove-it) with 35 samples auf BAL-fluid including patients with non-resolving pneumonia. Most of the patients are already pretreated before a sampling with BAL could be done. We included 22 patients (group A) undergoing bronchoscopy with BAL with a strong clinical suggestion of bacterial infection (purulent bronchial secretions) and 13 patients (group B) with no evidence of bacterial infection and no inflammatory signs in the peripheral blood (low CRP). 73% of group A were under antibiotic treatment as compared to 15% in group B. Conventional microbiological cultures showed no growth in group B. In group A there were bacteria grown from 10 samples (45%). The Prove it assay identified additional bacteria in 7 BALs of group A with negative culture results (mainly haemophilus influenzae). 3 cases were cultural positive (pseudomonas aeruginosa, klebsiella oxytoca, enterobacter) without detection in Prove it assay. On the other hand bacteria were identified by Prove it in 6 cases of group B. Conclusion: Bacterial Multiplex PCR (Prove it) might be an interesting tool to diagnose bacterial infection in the BAL of patients with nonresolving pneumonia under current treatment with antibiotics.