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Title: Detection of antibodies against *Pseudomonas aeruginosa* in the sputum of cystic fibrosis patients: A pilot study

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Body: Chronic *Pseudomonas aeruginosa* (Pa) infection plays a pivotal role in disease progression in patients with cystic fibrosis (CF). The aim of this cross-sectional study was to test whether anti-Pa antibodies can be detected in the sputum using common serological methods. During routine ambulatory visits blood and spontaneously expectorated sputum samples were obtained from 29 adult CF patients (11 chronically infected with Pa [Pa+], 10 non-infected [Pa-] and 8 intermittently infected [Pa+/-]). Anti-Pa antibodies (IgA and IgG) in serum and in sputum supernatant were measured with ELISA originally developed for measuring anti-Pa antibodies in serum (Genesis Diagnostics). Data are presented as means±SEM. As expected serum IgA levels were elevated in Pa+ as compared to Pa- patients (20.3±9.5 vs. 6.0±1.5 pg/ml, respectively, p<0.05). Sputum IgA levels were above the detection limit of the assay in all subjects, and were significantly increased in Pa+ compared to Pa- patients (20.6±5.6 vs. 8.5±1.1 pg/ml, respectively, p<0.05). In Pa+/- patients sputum IgA levels were similar to that of Pa- patients (p>0.05). In all subjects serum and sputum IgA levels showed a close correlation (r=0.525, p<0.01). The sensitivity and the specificity of the assay in sputum were 70 and 72%, respectively, as compared to 44 and 90% in serum. Sputum IgG antibody concentrations remained under the detection limit of the assay in most cases. In conclusion, sputum anti-Pa IgA antibody levels are elevated in patients with chronic Pa infection. The sensitivity of the assay is even greater in sputum than in serum raising the possibility that sputum could be material of choice for the early detection of Pa.