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Title: Enzymatic activity and clinical parameters in non-cystic fibrosis bronchiectasis: A cohort analysis

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Body: Introduction: Non-cystic fibrosis bronchiectasis (NCFB) is characterized by a vicious cycle of infection, inflammation and enzymatic actions, reinforcing each other and leading to progressive lung damage. We aimed to investigate the enzymatic activity in a NCFB population, to compare with controls and to correlate with clinical parameters. Methods: 63 patients (27male, 59 ± 18y) with NCFB were recruited and 16 controls (7male, 56 ± 18y), perfectly matched. Each patient was evaluated by spirometry, Leicester Cough Questionnaire (LCQ) and Sputum Colour Chart (SCC). Sputum was induced with hypertonic saline inhalation and succeeded in 49 NCFB patients and 12 controls. Total/differential cell count in sputum was assessed and total gelatinolytic activity (TGA), neutrophil elastase (NSE) and MMP-9 were measured. Results: TGA and NSE were higher in patients vs controls ($p=0.04$ and $p=0.0003$) and both correlated with neutrophil count (NSE: $p=0.009$; $r=0.38$ and TGA: $p<0.0001$; $r=0.60$). Subanalysis of high value TGA showed that NSE accounted for 82% of the activity vs 18% MMP-9 ($p<0.0001$). There was an inverse correlation between neutrophils and FVC% ($p=0.02$; $r=-0.35$) and NSE and FVC% ($p=0.04$; $r=-0.29$) in NCFB. No relationship was seen between total LCQ score, LCQ subscores and enzymatic gelatinolytic activity. There was however a significant relationship between the SCC and TGA ($p=0.003$) and NSE ($p=0.01$). SCC also correlated with neutrophils ($p=0.001$). Conclusion: TGA is significantly higher in NCFB and correlates with indices of inflammation and infection (neutrophils and SCC). The majority of TGA was exercised by NSE (82%) in NCFB. No correlation was seen with radiologic score or LCQ.