Reflux and cough

S29 COUGH FREQUENCY AND MORBIDITY IN INPATIENTS WITH ACUTE RESPIRATORY DISEASE

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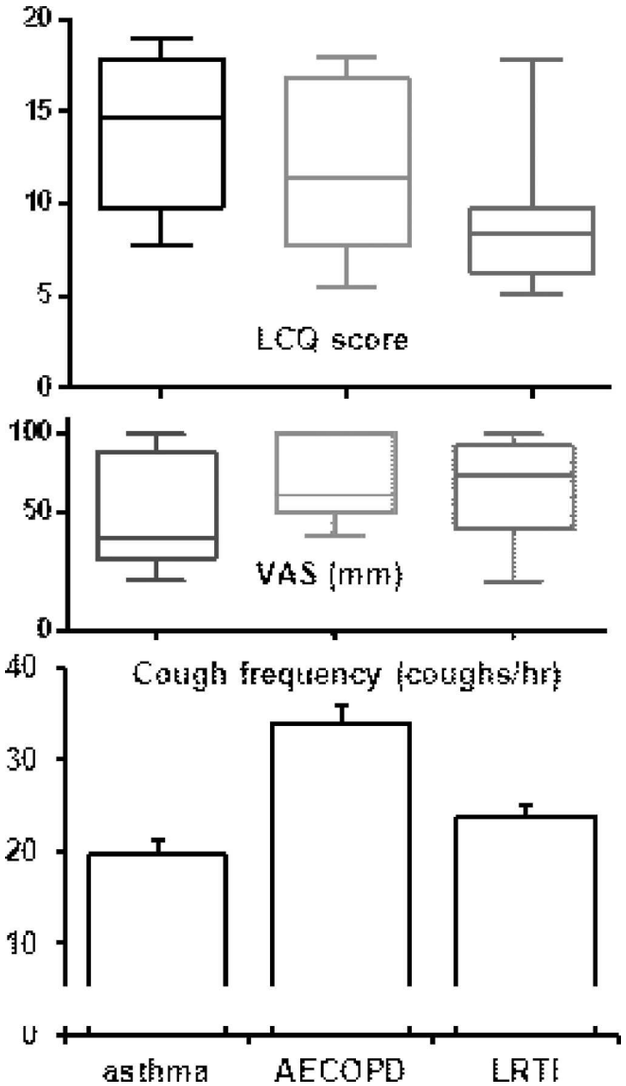
Introduction Cough is the unique respiratory symptom. Although associated with a range of conditions it has been little studied in acute respiratory disease. We describe cough frequency and cough-related quality of life in this group.

Method Participants had a diagnosis of acute exacerbation of asthma (asthma), chronic obstructive pulmonary disease (AECOPD), or lower respiratory tract infection (including community-acquired pneumonia) in the absence of the other respiratory disease (LRTI). Quality of life was measured with the Leicester Cough Questionnaire (LCQ-acute), cough severity with a visual analogue scale (VAS) and 24-hour cough frequency with the Leicester Cough Monitor.



Abstract S29 Figure 1. Quality of life, subjective cough severity and 24-hour cough frequency in acute respiratory conditions Leicester Cough Questionnaire (LCQ) and cough visual analogue scale(VAS) data shown as median, range and interquartile range. Cough frequency shown as geometric mean and log_{10}SD.

Results 40 patients were recruited within a median (interquartile range) of 1 (1–2.3) day ( ) of hospital admission. Median (IQR) age was 57 (41–71) and 63% were female. Geometric mean ± log_{10} SD cough frequencywas high: 19.7 ± 1.36, 33.8 ± 2.02 and 23.6 ± 1.31 coughs/h for asthma (n = 11), AECOPD (n = 15) and LRTI (n = 14) respectively (Figure); median (IQR) cough bouts/24h: 81 (54–210), 148 (97–197) and 129 (67–197). There was no significant difference between disease groups in these values ($p > 0.05$ for all two-way comparisons). Diurnal variation and median numbers of coughs/ bout were similar between groups. The 48% of patients who were current smokers coughed more than non-smokers (33.6 ± 1.91 vs 20.2 ± 1.38 coughs/h, $p = 0.07$). No difference in cough frequency was detected amongst the 25% taking angiotensin converting enzyme inhibitors. Gender had no significant overall effect.

Median (IQR) VAS scores were 39 (32–86), 73 (53–100) and 82 (48–91) for asthma, AECOPD and LRTI respectively with no significant difference between them. Cough severity showed a significant correlation with 24-hour cough frequency overall (Spearman' coefficient 0.33, $p = 0.05$). LCQ-acute scores were lower for LRTI (8.4; 6.4–9.5) than asthma (14.7; 10.7–17.5); $p = 0.01$ (Figure 1). Neither was significantly different from those for AECOPD (11.5; 8.5–15.6). Quality of life did not correlate with cough frequency (Spearman' coefficient -0.13; $p = 0.48$).

Conclusion Cough frequency in acute respiratory disease is high but with high variation. Cough frequency accounts for only part of morbidity in these conditions.

S30 SALIVARY PEPSIN AS A BIOMARKER OF AIRWAY REFLUX IN IDIOPATHIC PULMONARY FIBROSIS - AN OBSERVATIONAL STUDY

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Introduction and Objectives Current understanding of IPF proposes repetitive pulmonary epithelial injury with aberrant healing as a principal mechanism. Gastro-oesophageal reflux (GOR) and micro-aspiration of gastric contents may cause lung injury with subsequent fibrosis, and GOR is known to be prevalent in IPF patients. We assessed the feasibility of salivary pepsin measurement in IPF patients and investigated the temporal variability and relationship between salivary pepsin and symptoms.

Methods IPF patients collected saliva samples at multiple time points over the course of one day. Early morning, lunch- and dinner-time samples were analysed and compared with results from a historical control group of 100 healthy volunteers. Samples were analysed for the presence of pepsin using Peptest™ (RD Biomed Ltd). Patients were defined as pepsin positive if they had pepsin detectable in at least 1 saliva sample. The St George's Respiratory Questionnaire (SQRQ), Hull Airways Reflux Questionnaire (HARQ), and the REFLUX questionnaire were used to assess the relationship between pepsin positivity and symptoms.

Results All 21 IPF patients successfully provided saliva samples, of which 17 patients (81%) were pepsin positive compared to 36 of 100 healthy volunteers (36%), $p = 0.0004$. The proportion of

subjects with 1, 2 and 3 positive samples during a 24 hour period were 52%, 14% and 14% respectively in IPF patients and 20%, 12% and 4% in control subjects. There was no significant difference in reflux-related quality of life or respiratory quality of life between pepsin positive and pepsin negative patients measured using the REFLUX questionnaire (mean 93.6 ± 2.6 SEM vs 97.8 ± 2.3, p = 0.47) and SGRQ (49.5 ± 3.5 vs 34 ± 11.9, p = 0.1). The HARQ score was significantly higher in pepsin positive patients (23.8 ± 3.3 vs 7.5 ± 3.3, p = 0.03).

Conclusion Salivary pepsin measurement is simple, convenient and acceptable to patients. Our results confirm an increased prevalence of positive salivary pepsin in IPF patients compared to healthy volunteers but demonstrate a marked temporal variability. Therefore, more than one sample or repeated sample collection is required for optimal sensitivity.

S31 PEPSIN DETECTION DESPITE THE USE OF ACID SUPPRESSANT MEDICATION IN PATIENTS WITH AIRWAY REFLUX RELATED CHRONIC COUGH

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Background Chronic cough (CC) is an increasing problem that is not easy to treat with medication. Associated symptoms include hoarse voice, dysphonia, persistent tickling and irritation of the throat or chest. These lead to poor sleeping and eating patterns, loss of vocal independence and social isolation all resulting in an impaired quality of life. Airway reflux is a common cause of unexplained chronic cough and proton pump inhibitor (PPI) medication is commonly prescribed as initial therapy. The following study assessed pepsin identification in CC patients as a marker of airway reflux on PPI.

Methods Symptomatic expectorated saliva samples were obtained from 16 patients (6 male/10 female, 50 years (37–76), Body Mass Index (BMI) 30 (24–44), median (range)) attending clinical appointment with symptoms of chronic cough. Pepsin was identified using the Peptest™ an *in vitro* diagnostic medical device specific for human pepsin A (RD Biomed Ltd, UK). All patients completed the Hull Airways Reflux Questionnaire (HARQ) to determine airway reflux related cough (range 0–70; <13 normal). Patient demographics and medication data was provided on sample collection.

Results Fourteen (88%) of the CC patients were positive for pepsin in saliva samples (median 83ng/ml; range 25–250), providing non-invasive verification of presence of reflux in this CC population. Thirteen pepsin positive patients were symptomatic of airway reflux related cough according to abnormal HARQ score (median 40; range 25–59) and all were taking PPI (20–60mg/d range collected from referral letter and patient questionnaire). The median BMI of the pepsin positive patients was 30 (range 25–44).

Conclusion Pepsin was present in 88% of suspected airway reflux related chronic cough patients therefore corroborating the diagnosis of reflux. Airway reflux is associated with unexplained chronic cough in patients receiving PPI highlighting that symptoms and reflux are still present despite acid suppression. Overweight and obese BMI status is a common feature of airway reflux related chronic cough patients. A reconsideration of the empiric use of acid suppression use maybe warranted for unexplained chronic cough.

S32 PEPSIN DETECTION IN EXPECTORATED SALIVA: A USEFUL MARKER FOR AIRWAY REFLUX?

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Introduction Gastro oesophageal reflux (GOR) is a very common cause for chronic cough. The clinical history of airway reflux differs from that of GOR disease and often the diagnosis of airways reflux is not considered. Although oesophageal investigations can support the diagnosis these are invasive, time consuming and expensive. The presence of pepsin in the oesophagus, or more proximally in the pharynx or the airways, suggest GOR. The aim of this study was to study the diagnostic utility of measuring pepsin in expectorated saliva in unselected patients presenting with chronic cough.

Methods Consecutive patients referred to the Hull Cough Clinic were instructed to collect expectorated saliva on three occasions following symptoms (paroxysm of cough). Saliva was collected into tubes containing 0.5 ml of 0.01 M citric acid and analysed for the presence of pepsin using a lateral flow test comprising two unique human monoclonal antibodies to pepsin (Peptest™, RDBiomed Ltd). The cut off value to determine pepsin positivity was 25 ng/ml. Patients also completed the Hull Airways Reflux Questionnaire (HARQ), a validated tool to diagnose airways reflux.

Results 72 patients were included in this study (females 49, mean age 58.3 years). Salivary pepsin assay was positive in at least one sample in 46 (64%). 24, 10 and 12 patients had 1, 2 and 3 positive tests respectively. 10 samples had pepsin levels above 250 ng/ml. For purpose of comparison this data was examined against 300 similar pepsin assays from 100 healthy subjects with no typical or atypical reflux symptoms. In this group only 6 of 300 samples had more than 250 ng/ml of pepsin measured and 64% had all three samples negative for pepsin.[1] This is shown in table 1. The median HARQ score was 30 (range 1–67).

Conclusion A high proportion of patients with chronic cough have demonstrable levels of pepsin in expectorated saliva at the time of having symptoms. This non invasive test may be a useful investigation to support the diagnosis of airway reflux.

Abstract S32 Table 1. Test results for pepsin in patients with chronic cough compared to healthy volunteers

	At least one sample positive	One sample positive	Two samples positive	All three samples positive	All three samples negative	Pepsin level >250 ng/ml
Chronic cough patients	63.9%	33.3%	13.9%	16.7%	36.1%	4.6%
Healthy volunteers	36%	20%	12%	4%	64%	2%