REFERENCES

1 Ito *et al. Pulm Pharmacol Ther* 2008;21(5):812–817
2 Plekova *et al. J Appl Physiol* 2013;115(2):268–274

P7 NEURONAL DYSFUNCTION IN ASTHMA; INSIGHTS FROM THE STUDY OF THE COUGH REFLEX

[1]I Satia, [1]K Holt, [1]H Badri, [2]M Woodhead, [3]P O'Byrne, [1]P O'Byrne, [1]SJ Fowler, [1]JA Smith. *[1]Centre for Respiratory and Allergy Research, University of Manchester, Manchester, UK; [2]Central Manchester NHS Foundation Trust, Manchester, UK; [3]McMaster University Medical Centre, Hamilton, Ontario, Canada*

10.1136/thoraxjnl-2014-206260.157

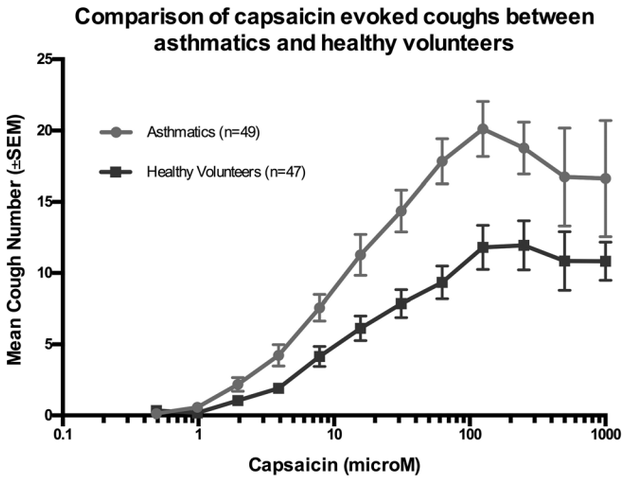
Introduction Cough in asthma is common, troublesome, predicts severity and poor prognosis, yet remarkably little is understood about the underlying neuronal mechanism. Currently available asthma medications are not designed to directly treat cough, the archetypal airway neuronal reflex. Previous studies have commonly used the dose of capsaicin that evokes two coughs (C_2) or five coughs (C_5) as the standard measure to assess the sensitivity of the cough reflex. These measures poorly discriminate between health and disease, and correlate only weakly with objective cough rates.[2] A novel challenge methodology that uses the maximum number of evoked coughs (E_{max}) as an end point better discriminates between health and disease and correlates strongly with subjective cough measures.[2]

Objective To assess the differences in the maximum cough responses evoked by capsaicin (E_{max}) between asthmatics and healthy volunteers.

Method A capsaicin inhalational challenge (doubling doses 0.49 to 1000[micro]M) was performed. Four inhalations 30 seconds apart were performed at each concentration and the total coughs evoked at each dose were recorded and verified using a cough monitor. The highest total number of coughs evoked at any dose of capsaicin is denoted E_{max}.

Results Fourty nine asthmatics were compared with 47 healthy volunteers. There was a significant difference in the median age between groups (asthmatics 22.9 (IQR 20–27), healthy volunteers 38.0 (29–47) $p < 0.001$). Equal ratios of females were recruited in both groups (31 in asthmatics and 30 in healthy volunteers). There were no significant differences in gender, body mass index, smoking history or lung function. Asthmatics were of the mild to moderate category (BTS steps 1/2/3, 45/39/16%). There was a significant difference in the E_{max}between asthmatics (mean coughs 20.5 (SD±10.1) and healthy volunteers 13.1 (±7.2) ($p < 0.001$). See Figure 1.

Conclusion Using this novel full dose response methodology, this data suggests that even during stability, asthmatics have an exaggerated cough response to capsaicin. This suggests that subgroups of asthmatics have neuronal dysfunction which can identified by this capsaicin challenge.



Abstract P7 Figure 1

REFERENCES

1 *J Allergy Clin Immunol*. 2008 Nov;122(5):903–7
2 *J Allergy Clin Immunol*. 2013 Oct;132(4):847–55

P8 OBJECTIVE COUGH FREQUENCY MONITORING IN BRONCHIECTASIS

[1]A Spinou, [1]R Garrod, [2]KK Lee, [2]C Elston, [3]MR Loebinger, [4]KF Chung, [3]R Wilson, [1]SS Birring. *[1]Asthma, Allergy and Lung Biology, King's College London, London, UK; [2]Adult Cystic Fibrosis Unit, King's College Hospital, London, UK; [3]Host Defence Unit, Royal Brompton Hospital, London, UK; [4]National Heart and Lung Institute, Imperial College London, London, UK*

10.1136/thoraxjnl-2014-206260.158

Introduction and objectives Cough is a major symptom in bronchiectasis. Cough monitors are emerging as an important tool that assesses cough objectively. The aim of this cross-sectional study was to assess cough frequency in non-cystic fibrosis bronchiectasis, investigate its association with patient-reported symptoms and health-related quality of life (HRQOL), and investigate potential factors of cough frequency variability.

Methods Patients with non-cystic fibrosis bronchiectasis were recruited from 2 outpatient bronchiectasis clinics. All patients underwent 24-hour ambulatory cough monitoring with the Leicester Cough Monitor, and reported sleeping time in a diary. The patients also completed the Leicester Cough Questionnaire (HRQOL), and visual analogue score (VAS) for sputum and cough severity. Sputum bacteria colonisation status was assessed, and defined as at least 2 positive cultures, minimum 3 months apart and within one year.

Results 49 patients were recruited; median (IQR) age 65 (52, 70) years, 64% female. The aetiology of bronchiectasis were: idiopathic (45%), post infective (29%) and other (25%). The prevalence of sputum colonisation were: pseudomonas aeruginosa

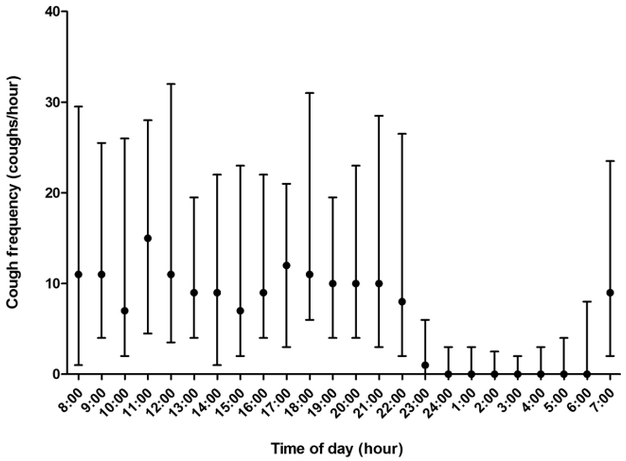


Figure 1. Cough frequency in patients with non-cystic fibrosis bronchiectasis. Data presented as median (IQR).

Abstract P8 Figure 1 Cough frequency in patients with non-cystic fibrosis bronchiectasis. Data presented as median (IQR)

38% and other organisms 29% of patients. Median (IQR) 24-hour, day time and night time cough counts were: 249 (112, 438), 240 (109, 404.5) and 24 (5, 56.5) coughs respectively. There was diurnal variation in cough frequency (Figure 1). Day time cough frequency was significantly greater than night time (Wilcoxon signed rank test $p < 0.01$). 24-hour total coughs were significantly associated with HRQOL (Spearman ρ=-0.54, $p < 0.01$), cough VAS (ρ=0.56, $p < 0.01$) and sputum VAS (ρ=0.48, $p < 0.01$). There was an association between 24-hour cough counts and gender (linear regression $p = 0.05$), but no association with bronchiectasis aetiology, sputum colonisation status or age.

Conclusions Cough frequency monitoring in patients with bronchiectasis is feasible. Higher cough frequency was associated with poorer HRQOL and worse patient-reported symptoms of cough and sputum. Patients coughed more during the day than at night. 24-hour cough frequency was variable and gender was identified as an influential factor. Future studies should investigate other potential factors for cough variability in bronchiectasis and evaluate the potential of cough frequency as an outcome measure for assessing the efficacy of therapy.

P9 COUGH IS PREVALENT IN HIGHER PROPORTION OF OLDER PATIENTS WITH BOTH IDIOPATHIC PULMONARY FIBROSIS AND NON-SPECIFIC INTERSTITIAL LUNG DISEASE

[1]G Saini, [1]T McKeever, [1]R Braybrooke, [1]R Hubbard, [1]G Jenkins, [2]RM Marshall, [2]PL Lukey, [2]JS Simpson. *[1]University of Nottingham, Nottingham, U. K; [2]Fibrosis DPU, GSK, Newcastle, UK*

10.1136/thoraxjnl-2014-206260.159

Introduction Cough is a major symptom of Idiopathic Pulmonary fibrosis (IPF), a progressive, fatal lung disease with median survival of 3 years. The first study to suggest cough as an independent predictor of disease progression, reported it in 84% of the population.[1] The only study to quantify cough in 19 IPF patients, reported strong correlation between objective cough counts and cough related quality of life[2] There is a lack of studies investigating the prevalence, pathogenesis or treatment of cough in IPF. We set up a study to evaluate the prevalence of cough in an incident IPF and Non specific Interstitial Pneumonia (NSIP) population.

Methods A prospective, multi-centre, observational, cohort study, PROFILE-Central England (September 2009 to June 2014) was set up. Patients had a diagnosis of definite or probable IPF or NSIP based on the ATS consensus. Leicester cough questionnaire (LCQ) was used to assess presence or absence of cough at baseline. Furthermore,the cohort was divided into 3 groups to assess severity of cough: Mild (17–20), Moderate (11–16.9) and Severe (<11).

Results 312 incident patients with IPF or NSIP were enrolled. 261/312(83.6%) patients had incident IPF whilst 51/312(16.4%) had NSIP. The mean age of the cohort was 73.5 years (35–90 years). 235/312(76%) were males with mean age 73.7 years (47–90 years); 74/312(24%) were females with mean age of 72.9 years (35.8–88.8 years).

261/312(83.6%) reported cough compared with 51/312 (16.4%) who reported no cough. Of the patients who reported cough, 45/261(17.2%) had severe cough, 112/261(42.9%) had moderate cough and 104/261(39.8%) had mild cough. There was no effect of gender, however, older cohort reported more cough (age >55 years; $p = 0.014$). Smoking may be a confounder, however the number of current smokers in the cohort is too small ($p = 0.05$).

Interestingly both NSIP and IPF cohort reported cough; however, proportionally NSIP patients have less cough (14/51,27.4%) compared with IPF (37/261, 14%).

Conclusions Cough occurs in a huge majority of patients with both IPF and NSIP. Cough appears to be a greater problem in older patients.

REFERENCES

1 Ryerson CJ *et al*. Cough predicts prognosis in idiopathic pulmonary fibrosis. *Respirology*. 2011 Aug;16(6):969–75
2 Key AL *et al*. Objective cough frequency in Idiopathic Pulmonary Fibrosis. *Cough*. 2010;6:4

P10 THE EFFECT OF NALTREXONE, AN OPIOID RECEPTOR ANTAGONIST, ON CAPSAICIN EVOKED COUGH, IN HEALTHY MALE SUBJECTS

I Satia, K Holt, E Hilton, AA Woodcock, J Smith. *Centre for Respiratory and Allergy Research, University of Manchester, Manchester, UK*

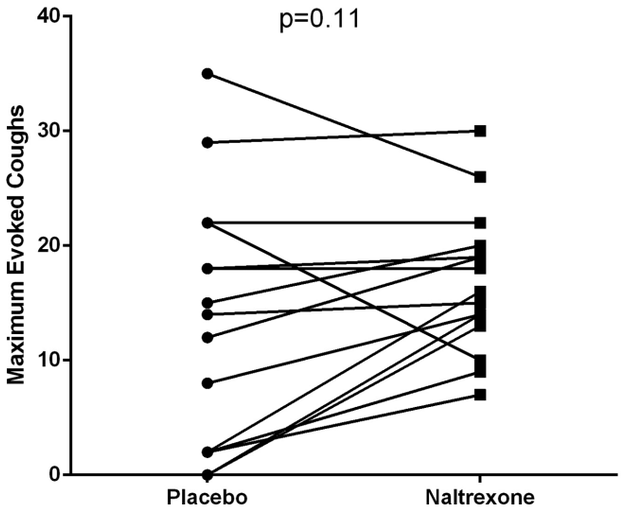
10.1136/thoraxjnl-2014-206260.160

Introduction Chronic cough is a troublesome condition that reduces patient quality of life. Recent evidence suggests that healthy females cough more than healthy males but the mechanism underlying this in unclear.[1] We hypothesise that opiate-sensitive inhibitory control mechanisms determine capsaicin-evoked cough responses in healthy subjects.

Aim To show that in healthy males the number of capsaicin-evoked coughs is increased following administration of naltrexone, an opiate receptor antagonist, compared with placebo.

Method 15 male subjects (median age 30 yrs (21–59)) were recruited in to a randomised double blind cross-over trial of single doses of naltrexone vs. placebo given 1 week apart. A capsaicin inhalational challenge (doubling doses 0.48 to 125[micro]M) was performed 60 min after ingestion of naltrexone/placebo using a dosimeter. Four inhalations 30 seconds apart were performed at each concentration and the total coughs evoked at each dose were recorded and verified using a cough monitor.

Results There was a tendency for subjects to cough more when treated with naltrexone (16.7 ± 2.7 (SEM) compared with placebo (13.7 ± 1.6), ($p = 0.11$, general estimating equations). See Figure 1



Abstract P10 Figure 1