correlated with TTS (p=0.91, p=0.82, p=0.22, respectively). TTS demonstrated high levels internal consistency (alpha) of 0.94 and test re-test reliability of 0.94 (p<0.001); suggesting that some items could be removed in subsequent stages. TTS correlated with total SGRQ score (r=0.32, p=0.02), in particular with SGRQ's symptoms score (r=0.44, p=0.001) and impacts score (r=0.61, p<0.001), but not with SGRQ's activity score (r=0.19, p=0.17). A significant relationship was found between TTS and total CSD score (r=0.56, p<0.001).

Conclusion Our preliminary data suggests that current TOPIC questionnaire items have value in discriminating idiopathic chronic cough from cough associated with chronic lung disease. Further data will be collected across different patient groups to identify the best items to retain in the final questionnaire. The TOPIC questionnaire may be a useful tool to quantify sensations or triggers of cough and may help us to better understand cough mechanism.

P103 THE URGE TO COUGH IN COPD

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10.1136/thoraxjnl-2017-210983.245

Introduction Urge to cough is a conscious perception of the need to cough. We investigated urge-to-cough, triggers and somatic sensations associated with cough in patients with COPD and compared it to patients with chronic refractory cough (CRC).

Methods We undertook a prospective case-control study of COPD patients with chronic cough (≥8 weeks) and patients with CRC. All patients completed a 27-item structured questionnaire (Cough Hypersensitivity Questionnaire; CHQ), that has a 5-point Likert response scale to assess urge-to-cough, aggravating factors/triggers and somatic sensations (0–4; 0=never and 4=occurs all the time in relation to cough). 10 COPD patients underwent a capsaicin challenge test to provoke an urge-to-cough sensation and to assess cough reflex sensitivity. The concentration of capsaicin that elicited 2 or more coughs (C2) and 5 or more coughs (C5) was recorded.

Results 62 COPD and 40 CRC patients were recruited (mean (SD) age 64(11) *vs* 54(14) years, 48% *vs* 70% females, FEV_1% predicted 48.2% (19.0) *vs* 94.1% (16.6) respectively). The top 5 cough triggers and somatic sensations in patients with COPD and CRC are summarised in Table 1. The severity of sputum trigger of cough and chest sensation associated with cough were significantly greater in COPD compared to CRC; median(IQR) sputum scores: 3 (2–4) vs 2 (1–2) and chest sensation scores: 2 (2–4) *vs* 1 (0–2) respectively, both p<0.01. The prevalence of urge-to-cough was higher in CRC *vs* COPD: 97.5% *vs* 75.8% respectively. The severity of urge to cough and eating/drinking trigger of cough were significantly greater in CRC compared to COPD; median(IQR) urge to cough scores: 3 (2–3) *vs* 2 (1–3) and eating and drinking scores: 2 (0–3) *vs* 1 (0–2) respectively, both p=0.02. Geometric mean(SD) C2 and C5 in COPD were 9.5 (18.2) and 10.9 (18.0) micromol.L^{-1}. There was a significant correlation between C5 and urge to cough in COPD (r_s=−0.74,p=0.02) but not with sputum trigger score (r_s=−0.10,p=0.80).

Conclusion Sputum is a significant self-reported trigger of cough in COPD. In contrast, urge to cough occurs more frequently in CRC. There are likely to be multiple mechanisms of cough in COPD and further studies should investigate whether phenotyping cough on the basis of self-reported triggers and somatic sensations can guide therapy.

Abstract P103 Table 1 Prevalence of triggers and somatic sensations associated with cough in COPD and chronic refractory cough. Data presented as percentage of all patients

Top 5 triggers and somatic sensations associated with cough	Prevalence (% patients)
COPD	
Sputum	87
Chest sensation	86
Smoke or smoky atmosphere	81
Dry throat	77
Exercise	77
Chronic refractory cough	
Urge to cough	98
Tickle in throat	93
Cold air	90
Irritation in throat	88
Postural change	88

P104 SENSATIONS ASSOCIATED WITH EXPERIMENTALLY EVOKED COUGH: INFLUENCE OF LOW DOSE MORPHINE SULPHATE IN OPIOID RESPONDERS

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10.1136/thoraxjnl-2017-210983.246

Introduction and Objectives Patients with chronic cough complain of a variety of sensations that they perceive as provoking coughing, identifying irritation, tickle and the urge to cough (UTC) as important. Effective therapies for chronic cough such as low dose morphine have failed to reduce experimentally evoked cough responses, but their effect on the sensations driving cough is unknown. We hypothesised that low dose morphine therapy reduces the sensations driving cough and predicted that the sensations experienced during inhalational cough challenge may demonstrate this mechanism.

Methods Twenty-two refractory chronic cough patients (mean age 61.7 years, 18 female, mean cough duration 14 years) taking low dose morphine sulphate treatment enrolled into a double-blind randomised controlled crossover trial comparing the effects of low dose morphine sulphate with matched placebo. Following withdrawal of their morphine therapy, participants were randomised to receive morphine (5–10 mg BD slow release) or matched placebo during two treatment period (5–7 days duration) separated by a 5–7 day washout. On the final day of each treatment period subjects inhaled increasing concentrations of citric acid (0.01–4 M, 18 ascending concentrations), rating irritation, tickle, UTC and taste on 100 mm visual analogue scales (VAS; 0 mm=none and 100 mm=worst) after each inhalation. The challenge continued until subjects coughed at least twice on any concentration of citric acid (C2). For the analysis, general estimating equation (GEE) models evaluated the effect of treatment on reported sensations, with increasing per citric acid dose.

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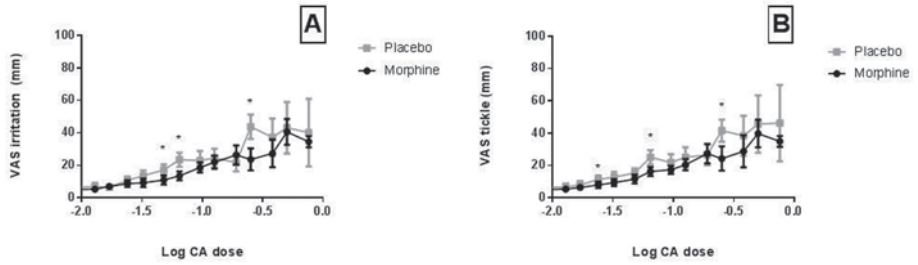

Abstract P104 Figure 1 Figure showing the effects of morphine and placebo on noxious sensations (A "Irritation" B "tickle") evoked by increasing doses of citric acid in our cough challenge *p < 0.05.

Results Compared with placebo, low dose morphine significantly reduced the VAS scores for tickle and irritation during the citric acid challenge (p=0.021, p=0.039), however UTC, taste and the number of coughs evoked were not improved (p=0.105, p=0.167, and p=0.337). Of particular note, morphine had no significant impact on C2 compared with placebo (p=0.611).

Conclusions This data shows that treatment with low dose morphine significantly reduces the noxious sensations driving cough. The effects on tickle and irritation appear more important than any impact on the UTC, numbers of coughs triggered or the traditional C2 endpoint, suggesting that reducing somatic sensations may be an important component of the mode of action of opioids in the treatment of cough.

P105 DOES FENO PREDICT CLINICAL CHARACTERISTICS IN CHRONIC COUGH?

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10.1136/thoraxjnl-2017-210983.247

Objectives In this study we aimed to explore the efficacy of FeNO (The fraction of exhaled nitric oxide) measurement in determining airway inflammatory phenotype in chronic cough patients. FeNO is a biomarker of eosinophilic inflammation. Sequential patients attending a specialist cough clinic were classified as low FeNO (FeNO ≤20 ppb) or high FeNO (FeNO ≥30 ppb) to evaluate the profile of other eosinophilic biomarkers (blood and sputum), cough frequency, and demographics to determine if they exhibited phenotypic variability.

Methods In total 49 patients completed the baseline visit. Correlations between FeNO, blood and sputum eosinophil cell count were assessed. We then compared the objective and subjective measurements of cough in patients with high FeNO and low FeNO at baseline. 24 hour cough counts were measured using the Hull Automated Cough Counter (HACC). Hull Airways Reflux Questionnaire (HARQ) and Leicester Cough Questionnaire (LCQ) were applied to measure cough subjectively.

Results There was a marked gender difference between groups with the low FeNO group having 90% women whereas the sexes were equally represented in the high FeNO cohort. The predominantly female, low FeNO group had more than twice the number of coughs recorded. Again at baseline there was a significant difference in HARQ and LCQ scores between high and low FeNO groups. Patients with low FeNO suffered more from cough symptoms in comparison with patients with high FeNO according to the 24 hour cough count, HARQ and LCQ scores. FeNO value had a strong correlation with blood and sputum eosinophil count (r=0.79 and r=0.65 p<0.001 respectively).

Conclusions By evaluating the demographic data, 24 hours cough count, HARQ and LCQ in high FeNO and low FeNO groups, different characteristics between these two cohorts observed. FeNO predicted the gender-related differences in demographic, with women markedly over represented in the low FeNO cohort. A female preponderance in patients with chronic cough has been well documented. However, the possible relationship between different inflammatory profiles as reflected by FeNO has not previously been described.

P106 THE USE OF GABAPENTIN AND PREGABALIN FOR THE MANAGEMENT OF CHRONIC COUGH IN A TERTIARY COUGH CLINIC

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10.1136/thoraxjnl-2017-210983.248

Introduction and Objectives Chronic cough is a poorly understood condition with a limited number of treatment options available. Gabapentin and pregabalin are used in the treatment of neuropathic pain and may have some efficacy in patients with refractory chronic cough.[1,2] We evaluated the real-world outcomes of using these medicines in a tertiary cough clinic.

Methods We performed a retrospective review of new referrals to a tertiary cough clinic (October 2013-October 2015). Patient characteristics (age, sex, duration of cough and test results) were collected. Follow up clinic letters were reviewed until April 2017. We recorded details regarding the prescribing of gabapentin and pregabalin for patients with refractory chronic cough, their impact on cough and the associated side effects.

Results 136 new patients were reviewed (mean age 56.3 years, 98 (72.1%) female) with a mean duration of cough of 7.5 years (SD 12.2). Gabapentin or pregabalin was prescribed for 38 patients (9 gabapentin and 29 pregabalin). Highest dose achieved was 1800 mg/day for gabapentin and 300 mg/day for pregabalin. Overall, fifteen patients (39%) responded favourably to these medicines initially. Fourteen (37%) tolerated them but derived no benefit and stopped the medication. Nine patients (24%) developed immediate side effects and were unable to tolerate the medications. Out of the 15 patients that tolerated these medicines, only 8 (21%) were able to continue with therapy long term, as the other seven (18%) eventually developed intolerable side effects. The most common side effect was drowsiness (see below).

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