



Cough hypersensitivity and suppression in COPD

Peter S.P. Cho ^{1,2}, Hannah V. Fletcher², Irem S. Patel², Richard D. Turner ³, Caroline J. Jolley¹ and Surinder S. Birring^{1,2}

Affiliations: ¹Centre for Human and Applied Physiological Sciences, School of Basic and Medical Biosciences, King's College London, London, UK. ²Dept of Respiratory Medicine, King's College Hospital NHS Foundation Trust, London, UK. ³Dept of Respiratory Medicine, Charing Cross Hospital, Imperial College Healthcare Trust, London, UK.

Correspondence: Surinder S. Birring, Dept of Respiratory Medicine, Chest Unit, Cheyne Wing, King's College Hospital, Denmark Hill, London, SE5 9RS, UK. E-mail: surinder.birring@nhs.net

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Cough reflex hypersensitivity and impaired ability to suppress cough are likely important mechanisms in patients with chronic refractory cough. Patients with COPD also have a hypersensitive reflex but in contrast are able to suppress cough effectively. <https://bit.ly/38UKzUO>

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ABSTRACT Cough reflex hypersensitivity and impaired cough suppression are features of chronic refractory cough (CRC). Little is known about cough suppression and cough reflex hypersensitivity in cough associated with chronic obstructive pulmonary disease (COPD). This study investigated the ability of patients with COPD to suppress cough during a cough challenge test in comparison to patients with CRC and healthy subjects. This study also investigated whether cough reflex hypersensitivity is associated with chronic cough in COPD.

Participants with COPD (n=27) and CRC (n=11) and healthy subjects (n=13) underwent capsaicin challenge tests with and without attempts to self-suppress cough in a randomised order over two visits, 5 days apart. For patients with COPD, the presence of self-reported chronic cough was documented, and objective 24-h cough frequency was measured.

Amongst patients with COPD, those with chronic cough (n=16) demonstrated heightened cough reflex sensitivity compared to those without chronic cough (n=11): geometric mean \pm SD capsaicin dose thresholds for five coughs (C5) 3.36 \pm 6.88 $\mu\text{mol}\cdot\text{L}^{-1}$ versus 44.50 \pm 5.90 $\mu\text{mol}\cdot\text{L}^{-1}$, respectively (p=0.003). Participants with CRC also had heightened cough reflex sensitivity compared to healthy participants: geometric mean \pm SD C5 3.86 \pm 5.13 $\mu\text{mol}\cdot\text{L}^{-1}$ versus 45.89 \pm 3.95 $\mu\text{mol}\cdot\text{L}^{-1}$, respectively (p<0.001). Participants with COPD were able to suppress capsaicin-evoked cough, regardless of the presence or absence of chronic cough: geometric mean \pm SD capsaicin dose thresholds for 5 coughs without self-suppression attempts (C5) and with (CS5) were 3.36 \pm 6.88 $\mu\text{mol}\cdot\text{L}^{-1}$ versus 12.80 \pm 8.33 $\mu\text{mol}\cdot\text{L}^{-1}$ (p<0.001) and 44.50 \pm 5.90 $\mu\text{mol}\cdot\text{L}^{-1}$ versus 183.2 \pm 6.37 $\mu\text{mol}\cdot\text{L}^{-1}$ (p=0.006), respectively. This was also the case for healthy participants (C5 versus CS5: 45.89 \pm 3.95 $\mu\text{mol}\cdot\text{L}^{-1}$ versus 254.40 \pm 3.78 $\mu\text{mol}\cdot\text{L}^{-1}$, p=0.033), but not those with CRC, who were unable to suppress capsaicin-evoked cough (C5 versus CS5: 3.86 \pm 5.13 $\mu\text{mol}\cdot\text{L}^{-1}$ versus 3.34 \pm 5.04 $\mu\text{mol}\cdot\text{L}^{-1}$, p=0.922). C5 and CS5 were associated with objective 24-h cough frequency in patients with COPD: ρ =-0.430, p=0.036 and ρ =-0.420, p=0.041, respectively.

Patients with COPD-chronic cough and CRC both had heightened cough reflex sensitivity but only patients with CRC were unable to suppress capsaicin-evoked cough. This suggests differing mechanisms of cough between patients with COPD and CRC, and the need for disease-specific approaches to its management.