

European Respiratory Society Annual Congress 2013

Abstract Number: 2770

Publication Number: P909

Abstract Group: 5.3. Allergy and Immunology

Keyword 1: Allergy **Keyword 2:** Asthma - diagnosis **Keyword 3:** No keyword

Title: The VCD-5: A short questionnaire for the diagnosis of vocal cord dysfunction

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Body: Background: Vocal Cord Dysfunction (VCD) typically involves abnormal adduction of the vocal cords during inspiration, potentially mimicking the symptoms of asthma and leading to increased prescription of ineffective medications. We aimed to develop a clinical tool for identifying VCD in patients with breathlessness, by simplifying our previously developed questionnaire (VCDQ). Method: The VCDQ comprises items focusing on specific symptoms common to VCD. A 5-point Likert scale is used, and it has been validated in VCD patients and healthy controls. Thirty-one patients with endoscopically confirmed VCD (approximately half also had asthma), 29 asthmatics with no history of VCD, and 14 healthy controls were recruited to complete the 12 item VCDQ. We ranked the questions by discriminatory power and selected the best-performing to form a new short questionnaire Results: The sum of scores from all 12 questions classified VCD versus healthy (Mann-Whitney test: $z = -5.390$, $P < 0.001$) and asthma ($z = -5.730$, $p < 0.001$). For VCD versus asthma question-specific z-scores ranged from -0.809 to -5.744 . Five questions had z-scores < -4.80 with $p < 0.001$, and using these alone improved classification between groups (area under receiver operating characteristics curve 0.988, compared to 0.953 with all 12 items). Using a cut-off score of 16/25, the short questionnaire had a sensitivity of 97% and specificity of 94% for VCD. Conclusion: Our five-item VCDQ is effective in differentiating VCD from asthma and, with prospective testing in new cohorts, may become a useful tool to identify patients with potential VCD for referral to specialist clinics for definitive diagnosis and treatment.