CHEST

Evaluation of Occupational and Environmental Factors in the Assessment of Chronic Cough in Adults

A Systematic Review

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BACKGROUND: Several recent cough guidelines have advised consideration of occupational or environmental causes for chronic cough, but it is unclear how frequently this recommendation has been routinely applied. Therefore, we undertook a systematic review to address this aspect.

METHODS: Cough guidelines and protocols were reviewed to identify recommendations for assessment of occupational and environmental aspects of chronic cough. The systematic search previously used to identify intervention fidelity to the use of protocols for diagnosis and management of chronic cough in adults was used for this review after extension to June 2015. PubMed, Scopus, and the Cochrane Library were searched using the same search terms and inclusion criteria as previously. Papers that met our criteria were then reviewed to identify methods used to assess occupational and environmental aspects of chronic cough and the outcomes of these assessments.

RESULTS: Among the 10 general chronic cough guidelines and protocols identified, only the three published since 2006 included details advising detailed occupational and environmental assessments. One additional cough statement focused entirely on occupational cough. Of the 28 cohort studies of patients with chronic cough that specifically noted that they followed guidelines or protocols, none provided details of occupational and environmental assessments.

CONCLUSIONS: Despite published recommendations, it is not apparent that occupational and environmental causes for chronic cough are addressed in detail during assessments of patients with chronic cough. This leaves open to speculation whether lack of recognition of an occupational cause may delay important preventive measures, put additional workers at risk, and/or be the reason why a chronic cough may remain unexplained.

CHEST 2016; 149(1):143-160

KEY WORDS: cough; environmental diseases; guidelines; occupational; systematic review

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FUNDING/SUPPORT: The authors have reported to *CHEST* that no funding was received for this study.

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DOI: http://dx.doi.org/10.1378/chest.15-1877

Cough is a common symptom among patients with occupational or environmental causes of respiratory diseases. Occupational diseases with cough as a manifestation include work-related asthma or eosinophilic bronchitis, occupational COPD, and occupational rhinitis with upper airway cough syndrome.[1-3] In addition, occupational or environmental exposures to airway irritants such as dusts, smoke, or fumes can lead to a cough, presumed to be neurogenic, without other clear pathogenesis.[2,4,5] Environmental exposures leading to a cough as part of respiratory diseases include tobacco smoking, second-hand smoke exposures leading to COPD and exacerbating asthma, and allergic respiratory diseases such as allergic rhinitis, asthma, and eosinophilic bronchitis. Infectious etiologies contributing to cough may also result from secondary effects of inflammation and mucus stasis in the sinuses and lungs.

Although several studies have assessed the occupational contribution to the burden of asthma to be about 18% and of COPD as approximately 15%,[6-8] there is less evidence for the population attributable risk of work-related cough. One estimate suggests a risk between 4% and 18%, but a distinction between personal causes of cough and occupational causes in published papers has not been clear, and the estimate range is wide.[9] Following the World Trade Center collapse, 8% of those highly exposed to the alkaline dust developed a chronic cough.[10] A Swedish study reported that 24% of welders had a dry cough.[11]

It is recognized that chronic cough can be explained in a high proportion of patients on the basis of an upper airway cough syndrome resulting from a variety of rhinosinus conditions (previously termed postnasal drip–associated cough), asthma, or nonasthmatic eosinophilic bronchitis or as a manifestation of gastroesophageal reflux disease. Most patients improve with management of one or more of these underlying conditions either empirically or with additional investigations, as recently reviewed.[12] Therefore, an "anatomic algorithmic approach" has been advocated in clinical practice guidelines and protocols for diagnosis and management of chronic cough.[13-17]

Despite a high rate of success in identifying an anatomic basis for cough and associated symptomatic benefit with management that targets these issues,[18-20] there is a possibility that this "anatomic" emphasis may neglect underlying occupational or environmental causes for the conditions that lead to chronic cough. Symptomatic control of the cough may mask an underlying occupational or environmental cause, delay further investigations and more definitive management, and/or be the reason why a chronic cough may remain unexplained. In a similar manner, although not the focus of this review, there are also other factors that, if not recognized and managed, may cause prolonged cough such as angiotensin-converting enzyme inhibitors (that can be discontinued) or bacterial infection (that can be treated). Moreover, lack of recognition of an occupational cause may also result in further workplace exposure that may cause additional or progressive disease, delay preventive measures, and put additional workers at risk.

Although several guidelines and protocols have included statements on the need for an occupational and environmental history as part of the assessment of patients with chronic cough, especially those published since 2006,[1,13,14,16] we are not aware of a previous systematic review to identify the position of this assessment in diagnostic algorithms and the outcome among studies that have used a diagnostic protocol for chronic cough in adults.

The aim of this systematic review was, first, to document the recommended approach to assessment of occupational and environmental factors in published cough protocols and guidelines, and, second, to evaluate the occupational and environmental evaluation, frequency of identification of patients with an occupational or environmental cause for chronic cough, and outcome of such patients among publications that have used cough protocols or guidelines to evaluate chronic cough in adults.

Methods

The systematic search previously used to identify intervention fidelity to the use of protocols for diagnosis and management of chronic cough in adults[12] was updated for this review to include articles published up to June 2015. PubMed, Scopus, and the Cochrane Library were searched using the same search terms and inclusion criteria used previously[12] (see e-Appendix 1). Institutional review board approval was not required for this systematic review. The extension study identification was conducted independently and in duplicate by two of the authors (S. M. T.) and (C. T. F.). Studies that met the following criteria were included, as previously reported:[12] (1) addressed chronic cough in adults; (2) used evidence-based clinical practice guidelines or protocols to diagnose and manage chronic cough; (3) diagnosed explained or unexplained chronic cough; (4) included any study design with the exception of