CHEST

Etiologies of Chronic Cough in Pediatric Cohorts

CHEST Guideline and Expert Panel Report

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BACKGROUND: There is no published systematic review on the etiologies of chronic cough or the relationship between OSA and chronic cough in children aged ≤ 14 years. We thus undertook a systematic review based on key questions (KQs) using the Population, Intervention, Comparison, Outcome format. The KQs follow: Among children with chronic (> 4 weeks) cough (KQ 1) are the common etiologies different from those in adults? (KQ 2) Are the common etiologies age or setting dependent, or both? (KQ 3) Is OSA a cause of chronic cough in children?

METHODS: We used the CHEST Expert Cough Panel's protocol and the American College of Chest Physicians (CHEST) methodological guidelines and Grading of Recommendations Assessment, Development, and Evaluation framework. Data from the systematic reviews in conjunction with patients' values and preferences and the clinical context were used to form recommendations. Delphi methodology was used to obtain consensus.

RESULTS: Combining KQs 1 and 2, we found moderate-level evidence from 10 prospective studies that the etiologies of cough in children are different from those in adults and are setting dependent. Data from three studies found that common etiologies of cough in young children were different from those in older children. However, data relating sleep abnormalities to chronic cough in children were found only in case studies.

CONCLUSIONS: There is moderate-quality evidence that common etiologies of chronic cough in children are different from those in adults and are dependent on age and setting. As there are few data relating OSA and chronic cough in children, the panel suggested that these children should be managed in accordance with pediatric sleep guidelines. CHEST 2017; 152(3):607-617

KEY WORDS: cough; evidence-based medicine; pediatrics

ABBREVIATIONS: CHEST = American College of Chest Physicians; GERD = gastroesophageal reflux disease; ILD = interstitial lung disease; KQ = key question; PBB = protracted bacterial bronchitis; PC-QOL = parent cough-specific quality of life; PRISMA = Preferred Reporting Items for Systematic Reviews and Meta-Analyses; QoL = quality of life; RCT = randomized controlled trial; UACS = upper airway cough syndrome

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Summary of Recommendations and Suggestions

1. For children aged ≤ 14 years, we recommend that common etiologies of chronic cough in adults are not presumed to be common causes in children (Level 1B).

2. For children aged ≤ 14 years with chronic cough, we recommend that their age and the clinical settings (eg, country and region) are taken into consideration when evaluating and managing their chronic cough (Level 1B).

3. For children aged ≤ 14 years with chronic cough, we suggest that clinical studies aimed at evaluating cough etiologies use validated cough outcomes, define response and diagnosis a priori, take into account the period effect, and undertake a period of follow-up (Ungraded consensus-based statement).

4. For children aged ≤ 14 years with chronic cough and suspected of having OSA, we suggest that they are managed in accordance with sleep guidelines (Ungraded consensus-based statement).

Chronic cough is a common reason for parents to seek specialist evaluation for their children. In children, chronic cough is associated with impaired quality of life,[1] multiple physician visits,[2] and adverse effects from inappropriate use of medications.[3] Recent studies[1,4,5] and systematic reviews[6,7] have found that using cough algorithms or pathways leads to earlier diagnosis and improved clinical outcomes, such as shorter duration of cough and increased quality of life. Thus, the updated American College of Chest Physicians (CHEST) guidelines recommended using pediatric-specific cough pathways when managing children with chronic cough.[8] Pediatric-specific chronic cough management pathways are different from those used in adults. The reasons for the difference include assessment of outcomes and the maturational aspects of immunity and physiology of the respiratory system (thus affecting aspects such as cough sensitivity[9]) from childhood to adulthood, as well as the most common etiologies of chronic cough.[10]

In adults, although common etiologies are somewhat dependent on continent (United States and the United Kingdom differ from Japan[11]), the most common etiologies identified include asthma or "cough variant asthma," gastroesophageal disease (GERD), upper airway cough syndrome/postnasal drip syndrome, chronic bronchitis, and idiopathic causes.[11,12] The frequency of the first three listed etiologies led to recommendations of empirical treatment for these conditions when managing adults with chronic cough.[13] In contrast, empirical therapy is not advocated for children in either the previous[14] or current[8] CHEST cough guidelines.

However, to date, there is no systematic review on the common etiologies of chronic cough in children in which children were systematically evaluated for the various possible causes of cough. Hence using the Population, Intervention, Comparison, Outcome framework, we performed systematic reviews to address key questions (KQ) relating to etiologies of cough in children. Given the recent interest in sleep and cough in adults with chronic cough,[15] one of the KQs specifically addressed this association. The 3 KQs addressed were:

KQ 1: In children with chronic (> 4 weeks) cough, are the common etiologies different from those in adults?

KQ 2: In children with chronic (> 4 weeks) cough, are the common etiologies age or setting dependent, or both?

KQ 3: Is OSA an etiology of chronic cough in children? If so, when should OSA be considered a cause of chronic cough in children?

In this paper, we present the systematic reviews for the KQs noted, a summary of the evidence, and the formulated recommendations based on these findings using CHEST's cough guidelines methods and framework.[16]

Methods

We undertook the systematic reviews based on the protocol[16] established by selected members of the CHEST Expert Cough Panel. We used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement for reporting. The KQs were framed by this paper's main authors.

Study Identification and Eligibility Criteria

Searches for the systematic reviews were undertaken externally by librarians (Nancy Harger, MLS, and Judy Nordberg, MLS) from the University of Massachusetts Medical School using the search strategies outlined in e-Appendix 1. We included only studies published in English. Duplicates found between Scopus and PubMed searches were identified and removed by the librarians before sending the abstracts to the two authors (A. C., J. O.) who reviewed the abstracts.

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