≋CHEST®

CrossMark

Use of Management Pathways or Algorithms in Children With Chronic Cough
Systematic Reviews

Anne B. Chang, MBBS, PhD; John J. Oppenheimer, MD; Miles Weinberger, MD; Kelly Weir, PhD; Bruce K. Rubin, MD; and Richard S. Irwin, MD, Master FCCP

BACKGROUND: Use of appropriate cough pathways or algorithms may reduce the morbidity of chronic cough, lead to earlier diagnosis of chronic underlying illness, and reduce unnecessary costs and medications. We undertook three systematic reviews to examine three related key questions (KQ): In children aged ≤14 years with chronic cough (> 4 weeks' duration), KQ1, do cough management protocols (or algorithms) improve clinical outcomes? KQ2, should the cough management or testing algorithm differ depending on the duration and/or severity? KQ3, should the cough management or testing algorithm differ depending on the associated characteristics of the cough and clinical history?

METHODS: We used the CHEST expert cough panel's protocol. Two authors screened searches and selected and extracted data. Only systematic reviews, randomized controlled trials (RCTs), and cohort studies published in English were included.

RESULTS: Data were presented in Preferred Reporting Items for Systematic Reviews and Meta-analyses flowcharts and summary tabulated. Nine studies were included in KQ1 (RCT = 1; cohort studies = 7) and eight in KQ3 (RCT = 2; cohort = 6), but none in KQ2.

CONCLUSIONS: There is high-quality evidence that in children aged ≤14 years with chronic cough (> 4 weeks' duration), the use of cough management protocols (or algorithms) improves clinical outcomes and cough management or the testing algorithm should differ depending on the associated characteristics of the cough and clinical history. It remains uncertain whether the management or testing algorithm should depend on the duration or severity of chronic cough. Pending new data, chronic cough in children should be defined as > 4 weeks' duration and children should be systematically evaluated with treatment targeted to the underlying cause irrespective of the cough severity.   CHEST 2016; 149(1):106-119

KEY WORDS: children; cough; guidelines; systematic review

Cough is the most common symptom presenting to primary care providers in many countries where data are available, such as in the United States[1] and Australia.[2] Whereas most of these consultations are likely for acute cough, a substantial proportion would be for chronic cough. Indeed, chronic cough is one of the most common presenting symptoms to respiratory specialty physicians.

The burden of the symptom is significant in terms of personal cost, with impaired quality of life (QoL)[3,4] and at a societal level at which physician visits, medication expenses, absenteeism, and the tendency to work while sick to avoid the stigma of being absent are substantial. In an attempt to ameliorate cough, various prescription and nonprescription medications are widely used.

Furthermore, the presence of chronic cough may reflect an underlying serious disorder.[4,5] Delayed diagnosis (eg, foreign body) may cause chronic respiratory morbidity[6]; early diagnosis of chronic diseases leading to appropriate management and subsequent resolution of cough and improved QoL[4] is important. Thus, in the evaluation of children with chronic cough, determining which children require further investigations and/or treatment is a key management strategy.

Use of appropriate cough pathways or algorithms is one such strategy that has the potential to reduce the morbidity of chronic cough, lead to earlier diagnosis of chronic underlying illness, and reduce the unnecessary costs and adverse events from medications used. Indeed, the use of guidelines, recommendations, and clinical pathways is usually considered an important factor for improving the quality of care and outcomes in the current era of evidence-based medicine.[7,8] Successful development of clinical guidelines requires many strategies, including endorsement from experts as well as determination of the quality of the evidence.[9,10]

In this article, our overall aim was to evaluate the use of management pathways or algorithms in children with chronic cough. We undertook three systematic reviews to examine three related key questions (KQs). In children aged ≤14 years with chronic cough (> 4 weeks' duration): (1) do cough management protocols (or algorithms) improve clinical outcomes? (2) should the cough management or testing algorithm differ depending on the duration and/or severity? and (3) should the cough management or testing algorithm differ depending on the associated characteristics of the cough and clinical history?

Materials and Methods

We undertook the systematic reviews based on the protocol[11] established by selected members of the CHEST expert cough panel. We used the Preferred Reporting Items for Systematic Reviews and Meta-analyses statement for reporting.

Study Identification and Eligibility Criteria

Librarians from the University of Massachusetts Medical School undertook searches for all three questions between February 28 and March 11, 2015, using the search strategies outlined in e-Table 1. For the CHEST cough guidelines, it was determined a priori that the age cutoff for pediatric and adult components was to be 14 years. However, to ensure that all relevant studies were captured, the search filter included studies up to age 18 years. We included only studies published in English. The librarians identified and removed duplicates between Scopus and PubMed searches before sending the abstracts to the two authors (A. B. C. and J. J. O.) who reviewed the abstracts.

Data Extraction and Quality Assessment

The two reviewers independently reviewed all abstracts and fully agreed on which full-text articles to retrieve to assess for potentially eligible studies. It was planned that disagreements that could not be resolved by consensus would be adjudicated by a third reviewer.

For randomized controlled trials (RCTs), the reviewers independently assessed the risk of bias criteria using criteria in Cochrane Reviews. Criteria used were random sequence generation (selection bias), allocation concealment (selection bias), blinding of participants and personnel (performance bias) to the study protocol, blinding of outcome assessment (detection bias), incomplete outcome data (attrition bias), and selective reporting (reporting bias). For cohort studies, data were extracted by a single author (A. B. C.) and checked by a second (J. J. O.). In cohort studies, we reported on the study's setting, number enrolled and completing the study, inclusion and exclusion criteria, and other factors (Tables 1-3)[12-34] that we considered important for interpreting studies on chronic cough specific to the KQs. These factors included an a priori definition for diagnoses, how cough was measured and resolution defined, and whether the period effect was considered. Reasons for these factors, considered quality factors for pediatric cough studies, are published elsewhere.[35]

Results

Preferred Reporting Items for Systematic Reviews and Meta-analyses diagrams for all KQs are presented in Figures 1-3. The risk of bias for RCTs included for KQ1 and KQ3 was combined into a single figure (Fig 4).

Key Question 1

Nine studies were included in the systematic review for KQ1 (Fig 1, Table 1). A single systematic review[17] was eligible for inclusion, but as the review consisted of a sole study,[12] we described the study instead.