LETTER TO THE EDITOR

Management of Chronic Cough in Adult Primary Care: A Qualitative Study

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Affecting about 10% of adults [1–3], chronic cough (CC) is one of the most common reasons for primary care visits [2, 4, 5]. CC, persisting longer than 8 weeks [1, 6, 7], affects quality of life, causing incontinence, pain, exhaustion, and depression [1, 2, 8]. In patients without roentgenographic abnormalities, conditions most often associated with CC are gastroesophageal reflux disease (GERD), asthma, and upper airway cough syndrome [2, 3].

Evaluation and treatment can be difficult [9], often including empiric antihistamines, decongestants, corticosteroids, proton-pump inhibitors (PPIs) [2], or lifestyle modifications [10], allergen avoidance [11], or behavioral therapy [3, 12, 13]. Pulmonology is a common referral target [14]. A UK survey found that only 31% of 51 PCPs were aware of CC guidelines, leading to estimation that 87% of patients were needlessly referred [15]. Accessibility and use of clinical guidelines [12, 16–19] by US PCPs are unknown.

This study is the first to describe, qualitatively, PCPs’ experiences evaluating and treating CC in adults. By interviewing clinicians, we sought to understand reasons for referrals, accessibility and use of clinical guidelines, confidence in evaluation and treatment, perceptions and attitudes, and desired resources. Findings may help in elucidating clinical decision-making and could indicate areas for improvement in dissemination and use of guidelines.

Study Design

Faculty PCPs of patients whose medical records from Eskenazi Health or Indiana University Health indicated CC treatment were contacted by an institutional recruitment service, to ascertain interest in completing an interview regarding experience in evaluating and treating CC. Fifteen consenting participants were targeted, as a number that could accommodate thematic saturation. A $50 e-gift card was offered. The Institutional Review Board approved the study.

Interviews

A semi-structured interview guide was developed (Table 1). Three researchers (TLT, TG, MH) trained in interviewing used it to conduct and audio-record one-on-one interviews lasting 25–50 min, in person or by telephone. Transcripts were de-identified; one-third were checked against recordings for accuracy.

Analysis

Qualitative data were analyzed using an iterative inductive and deductive approach, with codes defined a priori from the interview guide and revised during initial analysis to include emerging themes. Two researchers (TG, MH) independently read transcripts, becoming familiar with data, and assessing utility of a codebook. Using a corresponding template (Table 2), one researcher (MH) reviewed and summarized four transcripts. The other (TG) used software (NVivo 12) to code transcripts and sort quotes. Researchers
met for discussions and agreement on codes, sharing memos, questioning interpretations, and seeking data-based answers. Codes were extracted to compare with summaries and achieve thematic consensus. Investigators thus achieved understanding of participants' experiences and perceptions.

Among 317 eligible participants, 231 were approached, 18 responded to the initial email, and 15 completed an interview. Table 3 summarizes demographics. Participants practiced medicine through Indiana University Health. Clinical experience with CC ranged from 5 to 40 years (data not shown). Table 4 outlines themes and subthemes, from analysis.

**Theme 1: Defining CC**

All participants defined CC by duration, ranging from 2 weeks to 6 months. When etiology was unidentifiable, participants tended to diagnose CC. “If there is no other clear cause, then that’s when it would be called CC for me.” Numerous causes were reported, including GERD, asthma, and serious lung diseases. Some reported that patients commonly have multiple causes, hindering diagnosis and treatment. Some indicated a possible psychogenic component, stemming from anxiety, depression, and life stressors. Although psychogenic CC was largely reported as rare, a few believed that it is common. “I think there’s a psychogenic component to a lot of coughs... whether they did have a CC and now they’re just in the habit of coughing...”.

**Theme 2: Evaluation and Treatment**

Participants indicated that they would seek information related to common risk factors and causes of CC. Several indicated importance of reviewing medications for known causes. “I can make most of the diagnoses with a H & P and a med review, because sometimes it’s their medication.” Empiric treatments are often trialed; some participants recommend non-prescription medications first. Testing could include imaging, pulmonary function tests, allergy testing, or laryngoscopy. “We have a spirometer in our office, but I personally don’t feel as confident in my ability and our staff’s ability to get a great reading and then to read that result well. So I send all of my patients to a pulmonary lab.” Another participant noted, “I refer them to a pulmonologist. That’s the great thing about being a primary care doctor. If you’re dealing with a patient and you’re tired of dealing with them,
you just refer them on.” Managing CC may include a multiplicity of visits, tests, trials, and referrals. Many PCPs mentioned CC’s impact on quality of life. “I think that it makes it hard for them to sleep. If they’re in a business meeting, everybody is looking at them. They can’t be quiet in church. It’s an embarrassing symptom.”

### Theme 3: Experiences in Managing CC

Overall, participants reported confidence in their abilities to address CC. Nearly, all measured their confidence by the frequency with which they refer patients. “I am not like, ‘No, you need to go somewhere else right away’. No, I work with them. Get them comfortable and get them better.” Use of prescription medications depended on participants’ perceptions of helpfulness, cost, and fear of masking symptoms. “I want to solve the underlying problem rather than maybe giving them something like a Tessalon Perle, and maybe making them feel better, but we haven’t really solved the issue.” Several indicated that they avoid prescribing codeine, due to sedative, addictive effects. Thirteen of 15 participants indicated unawareness of clinical guidelines for CC. Two indicated following such guidelines but were unable to recall their source. “I guess I’m not aware of any specific ones for the evaluation and treatment of chronic cough, but I mean I’m certainly aware of guidelines for treating asthma, for treating COPD, treating GERD.”
Participants wanted additional resources, including better access to specialists and testing. Many desired “...a universal health tool for chronic cough...I feel like I have all the resources, but it’s sometimes difficult to get them all together,” Another participant desired a CC clinic: “So a one-stop shop. You go, and all of this stuff happens in one fell swoop, and you don’t need to make all of these different appointments...” Others wanted accessible and comprehensible educational resources and support groups for patients, information about guidelines, increased availability of counselors for psychogenic cough, and more affordable medications.

This qualitative examination of experiences and insights into CC revealed important misunderstandings among PCPs. Lack of knowledge and apparently low use of guidelines were surprising, considering the high prevalence of CC. Instead, participants relied on experiences and education from residency training. They appeared confident in management, but confidence appeared related to frequency of specialty referral. Treatments were largely empiric.

Several studies refer to the complexity of, and multifactorial approaches to, CC [8, 20, 21]. Following history and physical examination [20, 22, 23], participants used testing, supporting recommendations for tests such as radiographs and pulmonary function tests [2, 16, 18, 21]. Empirical treatment followed investigation. Participants reported prescribing PPIs frequently, though some studies do not support their use for nonacid GERD [1, 2].

Although guidelines demonstrate discrepancies and limited evidence, participants’ inconsistent definition of CC, and lack of awareness of guidelines [13, 15, 22], remain concerning. Lack of guideline utilization has consequences.

### Table 4  Themes and subthemes of providers’ experiences and perceptions in evaluating and treating chronic cough (CC)

| Theme | Description |
|-------|-------------|
| **Theme 1: “There are so many different causes.” Defining CC** | |
| A | CC criteria | Providers indicate their definition of CC (e.g., duration, consistency, absence of obvious cause) |
| B | Prevalence of CC | Providers report their perception of how often they see CC in practice |
| C | Causes of CC | Reported conditions that make CC more likely to occur, or that can cause CC, including patients who may be more at risk for having a CC (e.g., gastroesophageal reflux disease, allergies, asthma, postnasal drip, chronic obstructive pulmonary disease, smokers) and patients who develop a psychogenic component to their cough |

| Theme 2: “Sometimes it’s just trial and error.” Evaluation and treatment process | |
| A | Gather information | Providers gather information about the patient through history and physical examination, including reviewing medication lists, and observing patients during visits; and performing diagnostic tests |
| B | Trial treatments | Based on the information from the patient’s history and physical examination, providers recommend treatments to aid in evaluation of the cough’s cause and offer strategies to manage CC |
| C | Refer to specialists | Providers refer patients to specialists (e.g., pulmonologist, otolaryngologist, gastroenterologist, allergist) for diagnostic testing early in the process. After months of ineffective treatment or unsuccessfully trying to identify the cause of the cough, providers refer patients to specialists for treatment and further diagnostic workup |

| Theme 3: “CC in general is non-confidence building because it’s challenging...” Experiences managing CC | |
| A | Confidence of providers | Providers report their confidence in their ability to evaluate, treat, and work with patients who have CC. Providers describe their confidence in and perceived helpfulness of their recommendations, prescribed treatments, and home remedies in treating CC |
| B | Clinical guidelines for CC | Providers’ knowledge of, or usage of, clinical guidelines in their practice for evaluating and treating CC |
| C | Desired additional resources | Identified resources that are lacking or would be beneficial in evaluating and treating patients with CC |
First, clinical care can suffer, through unproductive tests, and more appointments, pharmacologic trials, and expenses for patients [20, 23]. With potentially misguided approaches, patients might experience prolonged CC durations and severity, along with anxiety and decreased quality of life. Patients may abandon treatment, living with dangerous conditions [1]. Varying definitions of CC can delay investigation [7, 12, 16, 18, 21]. Second, clinicians’ inattention to guidelines may limit confidence in management, sparking referrals. Our study found this association: the more participants referred patients to other specialties, the less confident they were in their own management. Third, translation of research suffers: if guidelines are not applied, resources used to generate evidence-based knowledge that informs them are less useful.

Our study has limitations. Because the institutional recruitment service protects privacy, information about characteristics of people who declined to participate is limited. Because participants came from one health institution, findings might not apply elsewhere. Sampling bias may exist due to voluntary participation; a qualitative study such as this does not seek to represent a population, but to describe a minimum range of perspectives and characteristics. Despite limitations, this study’s strength is qualitative exploration of clinicians’ experiences in working with CC. To our knowledge, it is the first such study.

In summary, PCPs expressed confidence in identifying CC’s cause, yet uncertainty or misunderstanding about its definition. Treatment often comprises trial and error. Prescription medications were often ineffective. Improvement in quality of care begins with access to, and knowledge and utilization of, clinical guidelines. Avenues for future research include studies investigating use of CC guidelines among larger populations. Better access to, or coordination with, specialists might also help and warrants study.

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Declarations

Conflict of interest Jessica Weaver, Jonathan Schellhout, and Vishal Bali are employees of Merck Sharp & Dohme Corp., a subsidiary of Merck & Co., Inc., Kenilworth, NJ, USA, and have stock ownership of Merck & Co., Inc., Kenilworth, NJ, USA. Ishita Doshi was an employee of Merck Sharp & Dohme Corp., a subsidiary of Merck & Co., Inc., Kenilworth, NJ, USA, and was stock holder of Merck & Co., Inc., Kenilworth, NJ, USA. Michael Weiner’s potentially relevant stock holdings are as follows: Abbvie, Inc., Accuray Inc., Allscripts HealthCare Solutions, Amgen, Inc., Boston Scientific Corp., Bristol Myers Squibb, Crispr Therapeutics Ag Co, Express Scripts Hldg Co., General Electric Co., Globus Med, Inc., Integer Hldgs Corp Com, Integra Lifesciences Holdings Corp., Int'l Business Mach, Johnson & Johnson, Mallinckrodt PLC, Mead Johnson Nutrition, Medtronic PLC, Meithe Inc Co, Mylan N V SHS Euro, Novo-Nordisk A S ADR, Nuvasive, Inc., Orthoelix Intl N.V., Perspecta Inc Com, Pfizer, Inc., Resmed, Inc., Roche Hldg Ltd., Seaspine Hldgs Corp., Senseonics Hldgs, Inc., Stryker Corp., Teva Pharmaceutical Industries, Varix Imaging Corp., Varian Med Sys, Inc., Walgreens Boots Alliance, Inc., Zimmer Biomet Hldgs, Inc., Zoetis, Inc. The study was sponsored by Merck, Sharp and Dohme: Tayler Gowan, Michael Weiner, Monica Huffman, Tasneem L. Talib, Ashley Griffith, and Paul Dexter.

Ethical Approval Approval was obtained from the Institutional Review Board of Indiana University. The procedures used in this study adhere to the tenets of the Declaration of Helsinki.

Consent to Participate Participants provided written consent.

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