Prevailing Practices for the Management of Dry Cough in India: A Questionnaire Based Survey

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Abstract

Purpose: The aim of the survey was to understand the prevailing practice pattern for the management of dry cough among primary care physicians in Indian clinical setting.

Materials and Methods: This single visit, cross-sectional, non-interventional, interview based physician survey was conducted over a period of 3 months where 500 registered physicians with at least 6 months of clinical practice and willing to participate in the survey were interviewed in their clinic or hospital from June to August 2015. They were asked to complete a structured questionnaire, consisting of 28 questions, regarding their routine clinical practice ranging from patient demographics to etiology to treatment modalities for management of dry cough.

Results: Approximately 40% physicians reported that 11-20% of their patients had dry cough predominantly. 57% and 46% physicians reported acute and chronic dry cough in >30% of their patients, respectively. 68% physicians reported that >21% of their patients with chronic dry cough were smokers and 61-62% physicians reported that 11-30% of their patients had exposure to pollution. As per physicians, 19.6% of their patients had allergy/asthma followed by respiratory tract infections (17.6% patients), smokers cough (11.4%) and gastroesophageal reflux disease (10.4%). 86.4% physicians recommended that the underlying cause of chronic dry cough should be determined prior to initiating the specific therapy and 13.6% recommended that cough should be suppressed to improve quality of life of the patients. Dextromethorphan (ranked 1 by 68% physicians) and codeine (ranked 2 by 47% physicians) were the most recommended antitussives in patients with dry cough.

Conclusion: Dry cough causes the significant impairment in patient’s daily associated activities. An increased awareness of treatment patterns for the management of dry cough among physicians could significantly improve patient’s quality of life.

Editorial Viewpoint

- According to this survey physicians have reported allergy / asthma, respiratory tract infection, smoker’s cough & GERD to be leading common causes of dry cough.
- For patients with chronic cough (>3 weeks duration) investigations are needed to establish diagnosis rather than symptomatic treatment.
- Earlier investigations may be warranted in cases with co-morbid conditions or associated severe symptoms.

Introduction

Cough is the ongoing problem that affects a large proportion of the human community leading them to seek medical attention. It has been identified as the sixth common reason for hospital outpatient department visits.

According to an Indian survey, 54% of Indians suffered from cough in 2009-2010. Various factors increases the risk of dry cough, including exposure to pollutants/environmental irritants, residence close to heavy traffic leading to respiratory problems, cigarette smoking, asthma, chronic obstructive airway disease, use of angiotensin converting enzyme, acute and chronic infections, airway disease, parenchymal disease, cardiovascular, gastrointestinal, etc.

Clinically, a period of 3 weeks has been taken as a cut-off point for an acute cough usually caused due to a viral or bacterial upper respiratory tract infection. It usually resolves within 3 weeks. Treatment of dry cough remains a challenge in patients. It is one of the most
chronic dry cough (> 3 weeks) among primary care physicians in India. In Indian clinical setting. Generally, cough accompanies cold in the majority of the cases; hence cold and cough is common complaint. In India, were asked to complete a questionnaire (28 questions) regarding their routine clinical practice ranging from patient demographics to etiology to treatment modalities. The completed survey form was submitted to Max Neeman Data management team for data analyses.

Despite the availability of various drugs, a little is known about management of patients with dry cough. Hence, the present study was planned to understand the prevailing practice pattern for the management of dry cough among primary care physicians in Indian clinical setting.

Material and Methods

This single visit, cross-sectional, non-interventional, interview based physician survey was conducted over a period of 3 months (first physician was interviewed in June 2015 and the last physician was interviewed on August 2015). A total of 500 registered physicians (250 general practitioners; 250 consulting physicians) with at least 6 months of clinical practice and willingness to provide their written consent participated in the survey. The physicians, across 15 cities of India, were asked to complete a structured questionnaire (28 questions) regarding their routine clinical practice ranging from patient demographics to etiology to treatment modalities. The completed survey form was submitted to Max Neeman Data management team for data analyses.

Due to non-interventional nature of the survey, no formal sample size was calculated. Descriptive statistics was used to analyze the survey results; the continuous variables were presented as mean±standard deviation and the categorical variables as frequency and number of patients. The study did not require an institutional ethics committee approval as it did not involve a direct participation of any patient.

Results

A total of 500 physicians, across different geographical locations of India, participated in the survey which aimed to understand the prevailing practices for the management of dry cough.

Demographics

Acute and Chronic Cough Status

Acute cough was defined as one with a duration of less than 3 weeks at presentation. Chronic cough was defined as lasting more than 3 weeks. Approximately 40% of the physicians reported that 11-20% of their patients had dry cough predominantly. 57% and 46% of the physicians reported acute dry cough (cough lasting <3 weeks) and chronic dry cough (cough lasting >3 weeks) in >30% of their patients, respectively. The remaining 43.2% physicians and 53.8% physicians reported acute and chronic dry cough in <10% (acute dry cough: 13.2%; chronic dry cough: 19.4%), 11-20% (acute dry cough: 13.8%; chronic dry cough: 20.0%), 21-30% (acute dry cough: 16.2%; chronic dry cough: 14.4%) of their patients (Figure 1).

Age and Gender

70% (349/500) of the physicians reported that >50% of their patients were males and 63% physicians reported that the average age of the patients suffering from dry cough was between 14 and 59 years.

Etiology

340 (68%) physicians reported that >21% of their patients with chronic dry cough were smokers and 61-62% physicians reported that 11-30% of their patients worked in either the industrial zone or stayed in the polluted environment. As per physicians, 19.6% of their patients had allergy/asthma followed by respiratory tract infections (17.6% patients), smokers cough (11.4%) and gastroesophageal reflux disease (GERD) (10.4%) (Figure 2).

Symptomatology

The associated symptoms reported ‘frequently’ were sore throat (73.0% physicians), sleep disturbance (51.4%), fever (49.8% physicians), and nausea and vomiting (9.0% physicians) (Figure 3).

When enquired about how cough affects the quality of life
(QoL) of the patient, the majority of the physicians reported that their patients with chronic dry cough frequently had disturbed sleep (80.6% physicians), occasionally had loss of work (52.2% physicians) and weakness due to medications (48.4% physicians), and frequently to occasionally had stress incontinence (40.4% physicians and 38.8% physicians, respectively. Of 500 physicians, 432 (86.4%) recommended that the underlying cause of chronic dry cough should be determined prior to initiating the specific therapy and the remaining 68 (13.6%) physicians reported that cough should be suppressed to improve QoL of the patients with chronic dry cough. The majority of the physicians (86.4%; 316/500) felt that non-specific therapy should be considered when cough has affected the QoL of a patient and 184 (13.6%) physicians felt that the non-specific therapy should be considered right at the beginning of the treatment along with the specific curative treatment if any, irrespective of the effect of dry cough on the QoL.

Investigations

Majority of the physicians preferred chest X-ray (262 [52.4%] physicians) and complete blood picture (228 [45.6%] physicians) for the diagnosis of dry cough.

Treatment Patterns

64.31% and 11.69% physicians recommended the drugs for obstructive airway disease and cough and cold preparations as the first line therapy for the treatment of dry cough associated with asthma, of these salbutamol (36.36% physicians) and dextromethorphan (36.21% physicians) was ranked as the first line of choice, respectively; 82.02% and 8.69% physicians recommended the drugs for acid related disorders and drugs for acid related disorders plus drugs for functional gastrointestinal disorders as the first line therapy for the treatment of GERD, of these pantoprazole (30.05% physicians) and domperidone plus rabeprazole (27.91% physicians) was ranked as the first line of choice, respectively; 53.72% and 15.09% physicians recommended...
Table 1: First-line of choice for treatment of dry cough

<table>
<thead>
<tr>
<th>Etiology</th>
<th>Preferred class of drug</th>
<th>% of physicians</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asthma</td>
<td>Drugs for obstructive airway disease</td>
<td>64.31</td>
</tr>
<tr>
<td></td>
<td>Cough and cold preparations</td>
<td>11.69</td>
</tr>
<tr>
<td>GERD</td>
<td>Drugs for acid related disorders</td>
<td>82.02</td>
</tr>
<tr>
<td></td>
<td>Drugs for acid related disorders + drugs for functional</td>
<td>8.69</td>
</tr>
<tr>
<td></td>
<td>gastrointestinal disorders</td>
<td></td>
</tr>
<tr>
<td>PNDS</td>
<td>Antihistamines for systemic use</td>
<td>53.72</td>
</tr>
<tr>
<td></td>
<td>Cough and cold preparations</td>
<td>15.09</td>
</tr>
<tr>
<td>Post infectious</td>
<td>Antibacterial for systemic use</td>
<td>33.40</td>
</tr>
<tr>
<td>cough</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respiratory tract</td>
<td>Antibacterial for systemic use</td>
<td>76.97</td>
</tr>
<tr>
<td>infection</td>
<td>Cough and cold preparations</td>
<td>10.10</td>
</tr>
</tbody>
</table>

(*inclusive of consulting physicians and general physicians)

recommended antihistamines for systemic use and cough and cold preparations as the first line therapy for the treatment of post nasal drip syndrome (PNDS), of these cetirizine (37.45% physicians) and dextromethorphan (62.67% physicians) was ranked as the first line of choice, respectively; 33.40% and 32.16% physicians recommended antibacterials for systemic use and cough and cold preparations as the first line therapy for post infectious cough, of these azithromycin (37.04% physicians) and codeine (48.72% physicians) was ranked as the first line of choice, respectively; 76.97% and 10.10% physicians recommended antibacterials for systemic use and cough and cold preparations, respectively as the first line therapy for respiratory tract infections, of these azithromycin (24.4% physicians) and dextromethorphan (56.0%) was ranked as the first line of choice (Table 1).

500 physicians, 258 (51.6%) and 165 (33%) physicians reported that <10% and 11-20% of the patients, respectively had a recurrence of dry cough within a year after stopping the treatment. Less than 10% of the physicians reported that 21-30% or >30% of the patients had recurrence of dry cough within a year after stopping the treatment (21-30% patients: 9.4% physicians; >30% patients: 6.0% physicians). Higher proportion (55%) of the physicians followed their patients with dry cough every 1-2 weeks followed by 21% of the physicians who followed <1 week, 19.8% physicians and 4.2% physicians followed their patients every 3-4 weeks and >4 weeks, respectively.

Majority of the physicians reported complications like insomnia (50.4% physicians), urinary incontinence (46.6% physicians), and muscle spasms involving chest wall (42.6% physicians) in patients with resistant cases of dry cough. Hernia and prolapse were reported occasionally to rarely in these patients.

Summary of Follow-up

54% of the physicians referred <10% of the patients with resistant dry cough to a specialist and 33.3% physicians referred 11-20% of the patients to a specialist.

Prescribing Patterns

The fixed dose combination (FDC) was prescribed by 318 (63.6%) physicians and the remaining physicians prescribed single molecule for treating dry cough. 46% (230/500) of the physicians recommended medications for 1-2 weeks for the management of dry cough. The majority (70%) of the physicians prescribed syrup formulation followed by tablets (23.2% physicians).

Co-morbid Conditions

As per physicians, hypertension (166 [33.2% physicians) was the most common co-morbid condition associated with dry cough followed by diabetes mellitus (143 [28.6% physicians), coronary artery disease (99 [19.8%] physicians), and benign prostate hyperplasia. Cold and cough preparation was the most preferred choice of treatment of dry cough in pediatric, elderly, and patients with diabetes mellitus, benign prostate hyperplasia, hypertension, and coronary artery disease. Of all the cold and cough preparations, dextromethorphan was considered as the first drug of choice followed by codeine in all the comorbid conditions.

Anti-tussive Agents

Dextromethorphan and/or its combinations was ranked 1 by 68% (340/500) physicians (consulting physicians: 172/250 [68.8%]; general practitioner: 168/250 [67.2%]), codeine and/or its combination was ranked 2 by 47% (235/500) physicians (consulting physicians: 114 [22.8%]; general practitioner: 121 [24.2%]) (Figure 4). Codeine and/or its combination was preferred as an antitussive in patients with neoplasm (67.8% physicians), post infectious cough (56.2% physicians), unexplained cough (55.6% physicians), and in cough associated with allergy (55.4% physicians).

Prognostic Factors

The duration, severity, etiology, and the response to the empiric therapy are considered as prognostic factors in the outcome of dry cough. 83.4% (417/500) of the physicians considered etiology as the most common prognostic factor in the outcome of the dry cough followed by duration (329 [65.8%] physicians), severity (293 [58.6%] physicians), and the response to empiric therapy (206 [41.2%] physicians).

Discussion

Dry cough is the common problem encountered in clinical practice which may be indicative of airway or lung disease. Among various types of cough, dry cough is the frequent cause prompting patients to seek medical consultation due
to its common occurrence and numerous etiologies.\textsuperscript{10,11} Healthcare expenditure for managing cough is substantial as QoL is severely affected. In past, although number of questionnaire surveys have been tried to evaluate the prevalence of respiratory symptoms,\textsuperscript{12} but they have not been designed specifically to assess chronic cough, its effects on QoL and management patterns. Therapeutic suppression of cough may be either disease-specific or symptoms related.\textsuperscript{10} Different drugs used in its treatment have insufficient evidence and rationale for their use. The prescribing behavior of physicians also varies with regard to management of dry cough. This is the first survey carried out in India to understand the prevailing practices for the management of dry cough.

The major aim of management of a patient presenting with cough is to identify the cause of cough and then to treat its cause by anti-inflammatory approaches. Chest radiograph is the initial investigation for diagnosis of chronic cough. When there is no apparent causes associated with persistent cough, antitussives are recommended.\textsuperscript{13} These drugs either act through central mechanism within cough center or reduce the response of cough receptors in the airways peripherally. Antitussives can be categorized as centrally acting or peripherally acting. The common centrally acting antitussive drugs include codeine, pholcodine, dextromethorphan, methadone, and morphine while peripherally acting drugs includes demulcents, local anesthetics and aerosols. In India, most antitussive formulations are the combinations of dextromethorphan or codeine, with antihistamines, expectorants, decongestants, and/or antipyretics.\textsuperscript{7} Codeine has been a mainstay in the treatment of cough for decades and widely regarded as the ‘gold standard’ drug.\textsuperscript{14} In our survey as well, 86.4\% of the physicians believed that underlying cause of chronic dry cough should be determined prior to initiating the specific therapy and the nonspecific therapy should only be initiated when cough has considerably affected patients QoL. Dextromethorphan and codeine were the most prescribed antitussive agents by 68\% physicians (consultant physician and general practitioner). Our observations are similar to a prior meta-analysis where dextromethorphan and codeine were considered as the preferred therapy in reducing the chronic cough.\textsuperscript{10} 52.4\% of the physicians preferred chest x-ray for diagnosis of chronic cough.

In our study, cold and cough preparation was the most preferred first and second drug of choice for the treatment of dry cough in pediatric, elderly, and patients with diabetes mellitus, benign prostate hyperplasia, hypertension, and coronary artery disease. In the present study, of cold and cough preparations, Dextromethorphan was the most preferred first drug of choice probably because of its non-narcotic nature as against Codeine which was the most preferred second drug of choice by the physicians (general practitioner and consultant physicians). The higher proportion of general practitioner prescribed Codeine as the first drug of choice as compared to consultant physicians for different comorbidities (pediatric, elderly, and patients with diabetes mellitus, benign prostate hyperplasia, hypertension, and coronary artery disease). Similar to this, Patel et al carried out an observational, cross-sectional, questionnaire based survey in Gujarat, where it was observed that general practitioners prescribed significantly more cold and cough preparations as a solid dosage form than the consultant physicians (86\% vs 58\%, \(p = 0.0001\)). However, there was no significant differences found between the two when compared on the basis of overall prescribing patterns of cold and cough preparation.\textsuperscript{15}

Past experience reveals that common cold, cigarette smoking, allergens, environmental pollutants, noxious substances, poor diet habits and gender are the common risk factors for cough.\textsuperscript{16} Smoking is one of the most important factor responsible for cough\textsuperscript{12}. In our study as well, > 21
% of the patients with chronic dry cough were smokers. However in actual practice, smokers hardly seek medical assistance for cough as they consider cigarette smoke to cause their cough.17

The American College of Chest Physicians Consensus Guidelines analyzed the data of 11 studies and reported PNDS, GERD, and cough variant asthma to be the most common causes of chronic cough.18 Some studies have reported cough to be the only symptom of asthma from 6.5% to 57% of the times.4 Cough is the initial worsening sign that may be associated with wheezing and shortness of breath in the asthmatic patients. Cough receptors may be sensitized by inflammatory mediators (such as, bradykinin, tachykinin, or prostaglandins) or stimulation of cough receptor through bronchial smooth muscle constriction leading to increased cough reflex. These patients are generally treated with antiasthmatic medications including bronchodilators and corticosteroid therapy. GERD is another one of the most common cause of chronic cough and may lead to symptoms of heartburn, chest pain and acid regurgitation. GERD associated cough has been suggested to occur through mechanisms such as hiatus hernia, reflux, laryngopharyngeal reflux, and microaspiration leading to increase in tracheal acidity and cough reflex. The management of GERD associated chronic cough includes anti-reflux diet, lifestyle changes, prokinetic agents and antacids; amongst which proton pump inhibitors are the preferred choice. Various studies have shown the resolution of cough with omeprazole treatment.19, 20

In our survey as well salbutamol and terbutaline (bronchodilators) and antacids (pantoprazole and rabeprazole) have been used for treatment of cough associated with asthma and GERD, respectively. Patients with dry cough had allergy/asthma, respiratory tract infections, and GERD; confirming these conditions to be the most common problems associated with dry cough. The proportion of consultant physicians and general practitioner prescribing drugs based on various causes of dry cough (viz asthma, GERD, PNDS, post infectious cough and respiratory tract infection) were comparable in the study.

Various complications induced by cough involves the respiratory, cardiovascular, digestive, genitourinary, musculoskeletal and nervous symptoms which contribute to a significant reduction in patient QoL.31 In our survey, insomnia, urinary incontinence and muscle spasm were the most common adverse effects in patients with dry cough; signifying the impact of dry cough in daily associated activities.

Higher proportion of physicians (63.6%) in this survey preferred FDC for treating dry cough. These prescribing patterns are similar to the report by Patel et al. where 82% of physicians recommended FDC for cough.15 Oral liquid formulations are helpful for patients with difficulty in swallowing, but have disadvantage such as their expensiveness, no benefits over solid dosage forms, and dose inaccuracy. Despite this fact, 70% of physicians in this study prescribed syrup to their patients. These observations are analogous to the previous reports where 78% of physicians recommended liquid dosage forms routinely to their patients.15

The limitations of this survey is that the available information is based only on questionnaire, actual prescription analysis could have served a better purpose. Secondly, none of the questionnaires were filled by patients which led to inability to capture information about cough status with greater accuracy. Thirdly, is a retrospective data collection which led to capture of limited data and that too with physician perspective which could lead to false interpretation of study results. The strengths of the study is that various questions have been asked to physicians to understand about the epidemiology, aetiology, treatment follow-up and prognosis of patients with dry cough. This helped to understand the prevailing practices for management of dry cough among primary care physicians in India.

In conclusion, as per physician’s perspective, the major causes of chronic dry cough were smoking and exposure to industrial effluents. Patients generally with asthma/allergy and respiratory tract infections had dry cough and are treated with salbutamol/terbutaline and azithromycin, respectively. Majority of the physicians recommended that the underline causes of chronic dry cough should be determined prior to initiating specific therapy and antitussive/non-specific therapy should only be recommended when the specific cause has not been found out. Cedeine was the most preferred first drug of choice by >20% of the physicians (general practitioner and consultant physicians) for treating dry cough in patients with benign prostate hyperplasia, diabetes mellitus, hypertension, coronary artery disease, and in elderly and pediatric patients; higher proportion of general practitioner prescribed codeine as compared to consultant physicians. Dextromethorphan and codeine were the most recommended antitussive by 68% of the physicians (general practitioner and consultant physicians) in patients with dry cough. Dry cough causes the significant impairment in patient’s daily associated activities. Hence an increased awareness of treatment patterns for the management of dry cough among physicians could significantly improve patient’s QoL.

Disclosure

This study was funded by Abbott Healthcare Pvt Ltd. Dr. Swati Biswas, Chief Manager- Medical
Services, Dr. Rakesh Pore, Medical Advisor- Medical Services, Dr. Srirupa Das, Associate Director, Medical Affairs all are employees of Abbott Healthcare Private Limited, Mulund, Mumbai.

References