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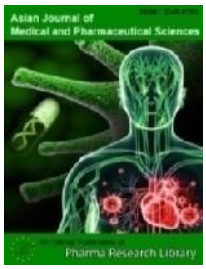

R E S E A R C H A R T I C L E

Community pharmacists' knowledge towards the treatment of cough: a cross-sectional survey in Ibb city, Yemen

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A B S T R A C T

Cough is a common reflex action in the respiratory tract and seen in many medical conditions. This is a cross-sectional survey performed in Ibb city, Yemen. Sixty-one of community pharmacists, who works in community pharmacies, were randomly selected for this study. The community pharmacists who were asking the patient about the age, duration of cough, type of cough, medications taken by patients, following up the pharmacist if cough not recovered through 7 days, presence of pregnancy or lactation, presence of fever, and presence of asthma with cough, were 75.5, 65, 74.8, 36.1, 23, 32.3, 47, and 23%, respectively. Only 62% of the participants referred the patients to specialists. In addition, high percentages of community pharmacists in the study area dispensed antibiotics and corticosteroids to adults and children (<6 years) as OTC medicines, codeine-containing cough medicine, and cough medicines for patients having chronic diseases (e.g. diabetes mellitus, heart disease, and hypertension). With respect to the adherence of medication dosage, only 35% of pharmacists told the patients about medication dosage. According to the results of the present study, high percentages of the study sample neglected certain important aspects of cough treatment, such as age, types of cough, duration of cough, and presence of pregnancy, lactation, fever, and infections. This might negatively affect the role of community pharmacists in the treatment of patients having cough.

Keywords: Community Pharmacists, Knowledge, Cough, Treatment.

A R T I C L E I N F O

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C O N T E N T S

1. Introduction

Cough is the most common symptom of airway and lung diseases [1]. Cough often is a symptom of cold and flu, but also can occur without cause. It is the most common symptom for which patients seek medical care [2]. Americans spent nearly $8 billion on cough and cold treatment in 2015 [2]. Cough is an important defensive reflex that helps clear secretions, foreign particles, and irritants from breathing passages. Cough may be voluntary or involuntary; each is controlled by a different area of the brain. There are three phases in the cough reflex inhalation, followed by forced exhalation against a closed glottis and violent air release from the lungs following glottis opening (the opening between the vocal cords), usually accompanied by a distinctive sound [3]. Cough is classified as acute, subacute, or chronic based on its duration [4].

An acute cough is less than three weeks in duration and can be caused by a viral upper respiratory infection (URI), pneumonia, aspirating foreign bodies, asthma, or acute left ventricular heart failure. A subacute cough is three to eight weeks in duration, and causes can include post infectious cough, bacterial sinusitis or asthma. A chronic cough is one of greater than eight weeks in duration and can include upper airway cough syndrome, asthma, gastrointestinal reflux disease (GERD), chronic obstructive pulmonary disease (COPD), carcinoma, left ventricular heart failure, or side effects of angiotensin-converting enzyme (ACE), inhibitors [5].

The process of cough sensitization remains unclear, and this may invoke both peripheral (i.e. in the airways) and/or central (i.e. in the brain) mechanisms. Central sensitization may occur by integration from various sensory nerve subtypes in the central nervous system to initiate exaggerated reflexes and sensation [6]. Peripheral mechanisms that can heighten cough reflex mechanisms have been mainly envisaged as an effect of altered environment of the cough receptors, such as the release of inflammatory mediators, prostaglandins or bradykinin that could enhance the response of the cough receptors [7]. In the treatment of cough, the community pharmacists must follow the guidelines of cough treatment. The purpose of the cough guideline and expert panel is to synthesize knowledge in a form that will aid for the diagnosis and management of cough. The aim of this study is to evaluate the knowledge of community pharmacists in treatment of cough in Ibb city, Yemen.

2. Methodology

Ethical approval:

Ethical approval was obtained from the Ethics Committee, Faculty of Allied Medical Sciences, Aljazeera University, Ibb, Yemen. Participation in the study was voluntary.

Study design:

This study is a cross-sectional survey and was performed by questionnaire, which distributed to the community pharmacies in Ibb city, Yemen to evaluate the knowledge of the community pharmacists in treatment of cough.

Study area and population:

The community pharmacists in three streets of Al-Dehar as well as Al-Mashanah districts, Ibb city form the population of this study. The survey was conducted during the period June to July 2018. Data collection was carried out using a structured face-to-face questionnaire with 61 randomly selected community pharmacists from different areas of the two districts mentioned above. The basic sociodemographic data of the study participants were collected. These include gender, age, qualification, and experience duration.

Questionnaire construction:

A structured questionnaire was prepared and included nineteen questions/parameters to be answered by the participants, including general information and medical history investigation of the patient. The survey was conducted by the research team, in which a single investigator met with the community pharmacist to explain the objectives of the survey before administering the questionnaire. Apart from the rare cases where the pharmacist responded immediately, the investigator was often obliged to return at a time suitable for the pharmacist.

3. Results and Discussion

Study participants:

Pharmacists, who accepted an invitation to participate, were randomly selected from pharmacies of two districts (Al-Dehar and Al-Mashannah). A total of 61 pharmacists were enrolled in the study. They were 32 (52.5%) in Al-Mashannah district and 29 (47.5%) in Al-Dehar district.

Sociodemographic characteristicsof the study participants:

The basic sociodemographic data of the community pharmacists were collected. These include gender, age, qualification, and experience duration. The results of these characteristics were presented in Table 1.

Table 1: Sociodemographic characteristics of the study participants

Characteristics	No. (n = 61)	Percent %
Gender		
Male	60	98.4
Female	1	1.6
Age		
18<30 years	38	62.3
30–<60 years	23	37.7
Qualification		
Bachelor	33	54.1
Diploma	27	44.3
Secondary school	1	1.6
Experience duration		
1–<5 years	26	42.6
5–<10 years	19	31.1
More than 10 years	16	26.2

From the results presented in Table 1, the majority of study participants were males (98.4%), and the minority were females (1.6%). Among the study participants, 38 (62.3%) of them were with age 18–<30 years, while 23 (37.3%) were with age 30–<60 years. With respect to the qualification of the study participants, most of pharmacists (54.1%) were bachelor holders, 44.3% diploma holders, and 1.6% secondary school holders. In this study, the experience duration of the study participants was distributed as 1–<5 years (42.6%), 5–<10 years (31.1%), and more than 10 years (26.2%). This shows that those pharmacists working in the community pharmacies are comparatively fresher and only few are staying in community pharmacies for long time.

The knowledge of the community pharmacists in the treatment of cough:

The questionnaire papers designed for the purpose of this study were filled in the pharmacies during the direct interview with participants. The questionnaire was contained simple questions regarding the treatment of cough in patients with different ages. These include medical history of the patient and very important information related to the treatment of the cough.

From the results illustrated in Figure 1, 76.5% of pharmacists asked the patient about the age. There are many causes of cough and they are often related to the age of patient. The common causes of acute cough include upper respiratory tract infections (the most common cause), hay fever (allergic rhinitis), inhalation of irritants, lower respiratory tract infections, lung clot (pulmonary embolism), lung collapse (pneumothorax), pulmonary edema, post-nasal drip (upper airway cough syndrome), and gastro-esophageal reflux. Some causes of chronic cough include chronic obstructive pulmonary disease, hypertension medications (ACE inhibitors), chronic lung infections (e.g. tuberculosis), and lung cancer [8].

Clinically, the big three causes of chronic cough in adults (asthma, post-nasal drip, and gastroesophageal reflux) are far less common causes of chronic cough in children. Therapeutically, some medications used empirically for cough in adults have little role in pediatrics. For example, anti-histamines (in particular H1 antagonists) recommended as a front-line empirical treatment of chronic cough in adults have no effect in pediatric cough. Instead, it is associated with adverse reactions and toxicity. Similarly, codeine and its derivatives used widely for cough in adults are not efficacious in children and are contraindicated in young children. Corticosteroids, the other frontline empirical therapy recommended for adults, are also minimally (if at all) efficacious for treating non-specific cough in children [9]. The data reported by Chang [9]support that management guidelines for pediatric cough should be different to those in adults as the etiological factors and treatment in children significantly differ to those in adults. With respect to the duration of cough, the results showed that 65% of pharmacists asked the patient about the duration, while 35% were none. Determining the duration of cough as a symptom is the first step in narrowing the differential diagnosis of cough. In addition, cough in children is different from that in adults in terms of duration, presentation, etiology, and management [10].

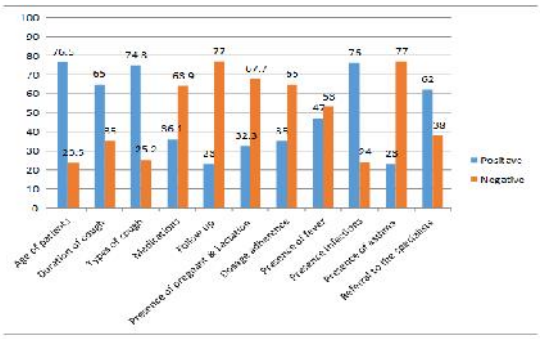

Fig 1: The types of information gathered and obtained from direct interview with community pharmacists in Ibb city

With regarding to the types of cough (dry or wet), the results showed that 74.8% of pharmacists asked the patient about the type of cough, while 25.2% were none. It is worth determining if the cough is productive (wet/moist with sputum production versus dry). Reporting of this feature compares well with the amount of phlegm seen at bronchoscopy. A cough that sounds wet or productive implies either an increase in airway secretions or abnormalities in its clearance mechanisms. Dry non-productive cough may be suggestive of allergens in an allergic patient, viral infections, tuberculosis, or inhaled irritants. Cough productive of casts is unusual and suggests the rare plastic bronchitis [11].

In the present study, 36.1% of pharmacists asked the patient about the medications taken by patients, while 63.9% did not ask any questions about the current medications being used by the patient. As a result, pharmacists failed to detect the underlying problem of the cough if the patient has taken medications, inducing cough. This result has been consistently seen in another study conducted in Indonesia by Brata et al. [12]. Angiotensin-converting enzyme inhibitors cause dry cough in 20% or more of treated patients. Systemic and ophthalmic beta-adrenergic blockers may cause cough in patients with obstructive airway diseases (e.g., asthma or chronic obstructive pulmonary disease [13].

Regarding to the patient's follow up for the pharmacists if not recover through 7 days, only 23% of pharmacists asked about this point, and the majority of pharmacists (77%) did not ask. For most patients, 7 days of nonprescription drug therapy should relieve cough. If the cough persists but has improved at follow up, the patient should continue the therapy until the cough is resolved. If the cough has worsened or the patient has developed other exclusions for self-treatment, the patient should be referred for further medical evaluation [13]. In the present study, only 32.3% of community pharmacists asked about the presence of pregnancy or lactation, and the rest (67.7%) did not ask. According to this result, there are chances for adverse drug

reactions with self-medication, because the pharmacist is unaware about the contraindication of medications, especially for pregnant or lactating women. Codeine is a pregnancy category C drug and should be used during pregnancy only if the potential benefits outweigh the risks. Non-teratogenic concerns include the risk of neonatal respiratory depression if codeine is taken close to the time of delivery and neonatal withdrawal if codeine is used regularly during the pregnancy. Although codeine is excreted in breast milk, the American Academy of Pediatrics lists codeine as a maternal medication usually compatible with breast-feeding [14]. Because the elderly may be more susceptible to the sedating effects of codeine, the dose should be started at the lower end of the dosage range and titrated as tolerated with careful monitoring. Diphenhydramine is a pregnancy category B drug. It is excreted in breast milk and may cause unusual excitation and irritability in the infant, and it may also decrease the flow of milk [13]. With respect to the adherence of medication dosage, only 35% of pharmacists told the patients about medication dosage, while 65% did not told them. This result reflex a big problem in the treatment of patient. Medication adherence is the voluntary cooperation of the patient in taking drugs or medicine as prescribed, including timing, dosage, and frequency [15]. Poor adherence to medication regimens is common, contributing to substantial worsening of disease, death, and increased health care costs [16]. Deterioration of the medication adherence for patients could result in wasteful medical expenditure in a long-term span as well as aggravating the patient's medical condition [17].

The pharmacists asked about the presence of fever in the patients having cough were 47%, while the rest percent (53%) did not. In addition, the pharmacists asked about the presence of infections were 76%, while the rest percent (24%) did not. Productive cough and fever are usually the presenting symptoms in patients with pneumonia. Acute cough with fever, malaise, purulent sputum, or history of recent infection should be assessed for possible serious acute lung infection [18].

The pharmacists asked about the presence of asthma with cough were 23%, while the rest percent (77%) did not. Asthma is a disease in which the airways narrow excessively in response to various stimuli in the presence of airway hyper-responsiveness and eosinophilic airway inflammation [19]. In classic asthma, variable airflow obstruction typically leads to symptoms such as wheeze, dyspnea, and cough. In cough variant asthma (CVA), cough can be the sole presenting symptom. CVA remains one of the commonest causes of chronic cough worldwide [20,21]. More importantly, in classic asthma, cough may be associated with worse prognosis [22,23].

The pharmacists, which refer the patients to specialists, were only 62%, while remainder pharmacists (38%) did not do that. The role of pharmacists is expanding in primary care. There is evidence that greater collaboration between physicians and pharmacists can improve patient care. Medication reviews are an example of how pharmacists can assist general physicians. In general, the roles of the physician and pharmacist are complementary. Good working relationships between all healthcare professionals are essential to the delivery of personalized and effective patient services [24]. For example, there are many indications in the world that asthma management is suboptimal. Ideally, patients need to proactively self-manage the condition with the support of health professionals. Community pharmacists are a highly accessible resource for patients, but currently provide inconsistent services. General practitioners also face many barriers to the provision of chronic disease management for asthma patients. Generally, all health professions must show greater responsiveness to meet patient needs [25].

From the results illustrated in Figure 2, 70% of community pharmacists enrolled in the study dispensed antibiotics as over-the-counter (OTC) medicines to adult patients having cough without doctor's prescription. In addition, 72.4% of community pharmacists are giving antibiotics to children under six years having cough. The same finding was reported by Hadi et al. [26] in Al-Riyadh city, Saudi Arabia. They found that 78% of surveyed community pharmacies (total n = 327) dispensed antibiotics without prescription. Dispensing antibiotics without prescription is a major contributing factor in the irrational use of antibiotics leading to the development of antimicrobial resistance [27,28].The non-prescription use of antimicrobials has been associated with shorter courses and suboptimal drug and dose choices [29–32]. It has been estimated that more than 50% of the antibiotics worldwide are sold without a medical prescription (OTC sales), despite the fact that dispensing without a prescription is illegal in most of the countries [33]. The phenomenon of dispensing antibiotics without prescription is not only common in low-income countries, but is also common in the developed world. Studies from several European and South American countries, including Spain, Greece, Portugal, Mexico, and Brazil, have reported this phenomenon [34–38]. Although illegal, dispensing without a prescription remains a serious problem in Yemen, as in many other countries in the Middle East such as Syria, Egypt, Jordan, and Saudi Arabia [39,40,26].

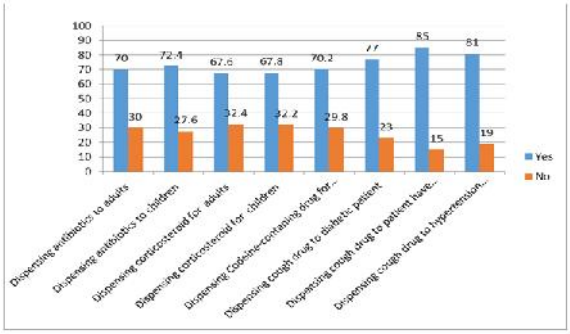

Fig 2: Information gathered and obtained from direct interview with community pharmacists in Ibb city, with respect of dispensing of medicines as OTC to patients with different ages

In the present study, 67.6% of community pharmacists dispensed corticosteroids for adults having cough without medical prescription. In addition, 67.8% of community pharmacists are giving corticosteroids to children under six years having cough. This was considerably higher than the 13% reported from the Netherlands [41]. Inhaled corticosteroids have pronounced anti-inflammatory properties [42]. They are recommended in prevailing guidelines for use in patients with persistent asthma or moderate-to-severe chronic obstructive pulmonary disease and recurrent exacerbations [41]. They are therefore effective in reducing morbidity and mortality in patients with persistent asthma [43,44] and in diminishing the incidence of exacerbations in patients with chronic obstructive pulmonary disease [45–47].

Besides these benefits, inhaled corticosteroids can cause adverse effects like oropharyngeal candidiasis, easy bruisability, cataract, open-angle glaucoma, and lowering of spine and femur bone densities [45,46]. Furthermore, inhaled corticosteroids use is associated with an increased risk of pneumonia, possibly due to protracted symptomatic exacerbations [48,49]. In the prevailing guidelines for asthma and chronic obstructive pulmonary disease, the evidence of the effectiveness of inhaled corticosteroids use has been weighted critically, and for their use outside these recommendations, the risk of side effects does not outweigh the benefits [50,51].

With respect to the dispensing of codeine-containing cough medicine, 70.2% of community pharmacists dispensed such medicine to children having cough. OTC anti-cough preparations, many of which contain codeine (an opioid) or dextromethorphan (an opioid-like), are widely available around the world [52]. Codeine is a derivative of opium and considered less potent in term of analgesic and sedative effects than opium. It has been used for treating cough, diarrhea, and pain [53]. However, their euphoria-inducing properties are addictive and a well-known target of misuse that may lead to excessive consumption in the form of abuse or overuse [52]. OTC abuse of codeine-containing cough syrups has been rising in many countries. It has been reported in Japan [54], Taiwan [52], and India [53]. Codeine is reported to be among the top four abused prescription drugs in the elderly population in Washington [55].

In the present study, 77 of community pharmacists dispensed cough drugs for patients having diabetes mellitus, while 23% of community pharmacists did not. Unlike the developed countries, many community pharmacists in Yemen are not yet legally. Various clinical factors were explored for their relationships with cough. Among comorbidity conditions, asthma, allergic rhinitis, diabetes mellitus, constipation, and gastritis showed potential associations [56]. The sweet syrups used in most OTC medicines may contribute to the cough suppressant and expectorant activity. Sweet syrups contains sugars, which can raise blood sugar level and this situation make diabetics at risk [57]. In the present study, 85% of community pharmacists dispensed cough drugs for patients having heart disease, while 15% of community pharmacists did not. In addition, 81% of community pharmacists dispensed cough drugs for patients having hypertension. Pharmacists are frequently asked to recommend treatment for the relief of cough resulted, for example, from common cold, often in patients who may also have elevated blood pressure [58]. In patients with hypertension, the use of certain medications that may raise blood pressure should be avoided [59]. It is important for pharmacists to raise awareness of considerations for their patients with high blood pressure, and to counsel them on appropriate treatment options that provide cold and flu symptom relief without adversely affecting their blood pressure. On the other hand, some medications of hypertension, e.g. lisinopril, may cause cough as a side effect of this drug [60]. In most developing countries including Yemen, there is scant literature on the involvement of the community pharmacist in the care of patients with chronic conditions, such as hypertension and blood pressure control.

Generally, the pharmacist must follow the guidelines of cough treatment. The purpose of the cough guideline and expert panel is to synthesize knowledge in a form that will aid for the diagnosis and management of cough across disciplines and also identify gaps in knowledge and treatment options. Published cough guidelines, albeit of varying quality and foci (e.g., adults, pediatrics, acute cough, chronic cough, cough in palliative care), have been developed by organizations from different countries, such as United States [8], Australia [61], Belgium [62], China [63], Germany [64], United Kingdom [18], Ireland [65], Netherlands [66], Japan [67], South Africa [68], and Spain [69].

4. Conclusion

According to the results of the present study on the evaluation of the knowledge of community pharmacists in the treatment of cough in Ibb city, high percent of the study sample neglected certain important aspects of cough treatment, such as age, types of cough, duration of cough, and presence of pregnancy, lactation, fever, and infections. This might negatively affect the role of community pharmacists in the treatment of patients having cough. Treatment of cough in patient should be based on the cough's etiology and the age of patients. Children with cough should be managed according to child-specific guidelines, which are different from adult guidelines. The data revealed that more than 50% of community pharmacists dispensed OTC codeine-containing cough medicine. Easy OTC availability, lesser expenditure, milder withdrawals, and ease of consumption without secrecy may be some of the reasons for the emergence of codeine addiction. Community pharmacists in the study area have poor understanding of the regulations prohibiting the OTC sale of many medicines, such as antibiotics and corticosteroids as revealed in this study. Our study emphasizes the importance of adding medical history data to spirometry in the assessment and treatment of cough.

5. Acknowledgement

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