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Review article

Impact of community pharmacists in COPD management: Inhalation technique and medication adherence

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ABSTRACT

Background: Inhalation technique and medication adherence are highly important for the management of chronic obstructive pulmonary disease (COPD) since they are essential pre-requisites for achieving full therapeutic effect in patients. Community pharmacists are in the best position to deliver services in these two areas.

Methods: This is a ten-year period review of studies looking into the impact of community pharmacists in the management of COPD in relation to: inhalation technique and medication adherence in the period from 2005 to 2015.

Results: Ten studies are included in the review. The studies show that community pharmacists' interventions had a positive impact on improving patients' inhalation technique and adherence to inhaled medications. This was shown in some studies to be cost-effective in terms of reducing hospitalisation and severe exacerbation rate. Scarcity of studies in this domain is noted through this review.

Conclusions: This review showed that community pharmacists can have a positive impact in the management of COPD especially on inhaler technique education and medication adherence. Nevertheless, their role is still not fully recognised in this area, thus there is a need for more research. There is also a need for more research to identify the optimal frequency for inhaler technique re-checking and education as a pre-emptive measure against technique deterioration in patients. The results highlight the need for healthcare systems to recognise more the role of community pharmacists in COPD management in two critical areas that are still challenging in real practice.

Contents

1. Introduction and background

Chronic Obstructive Pulmonary disease (COPD) is a chronic condition characterised by airflow limitation that is progressive in

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nature and partially reversible [1]. Tobacco smoking, indoor and outdoor pollution are all risk factors for COPD development [2].

One of the main objectives of the Global Initiative for Chronic Obstructive Lung Disease (GOLD) is to increase awareness of this condition [2]. This is particularly important due to the high economic and social burden of COPD on healthcare systems worldwide [1,2]. In the European Union, the estimated cost of COPD to healthcare systems (as direct costs only) is 38.6 billion Euros (equivalent to $42.3 billion); whereas in USA this was found to account to a budget of $29.5 billion as direct costs and $20.4 billion as indirect costs [2].

Inhalation technique (IT) and medication adherence (MA) are two key areas that should be looked upon with serious consideration when addressing management of COPD patients. IT is the process through which the patient correctly performs a number of steps in certain order to obtain the adequate dose out of the inhaler device [3]. The importance of IT stems from the fact that inhalation therapy represents the main pillar in COPD treatment [4–8]. It is the best treatment strategy to ensure delivery of adequate concentrations of the administered drug directly to the lungs [3–5,9–11]. Adherence is defined as the degree by which a patient follows a mutually agreed plan including medication and life style changes [12]. According to the World Health Organisation (WHO), adherence to therapy in chronic conditions is estimated to be only 50% in developed countries and lower in developing countries [12].

Incorrect IT may lead to poor disease control [6]. Some authors argue for poor IT to be a form of poor adherence [13], whereas others see that poor adherence can be triggered by poor IT, as the latter can result in patient's dissatisfaction with the treatment [3]. This can lead to medication wastage due to prescribing higher doses or even additional medications thus increasing the financial burden of the disease on healthcare systems [7,10]. In some studies, around 60% of COPD patients had poor adherence to their inhalation therapy [14,15]. A recent review reported a wide variation in adherence rates for asthma and COPD patients ranging from 22% to 78% [16]. Regarding IT, evidence from Europe shows that up to 50% of patients fail to use their inhalers correctly [17]. Whereas, another review highlighted that nearly 100% of patients perform mistakes in their IT that consequently result in delivering an inadequate dose of the inhaled medication [18]. Poor adherence and suboptimal IT can lead to increased healthcare costs and poor health outcomes. Thus, there is a need for interventions to improve these two areas.

The aim of this paper is to provide a review of studies evaluating the impact of community pharmacists' interventions on COPD management focusing mainly on IT and MA.

2. Materials and methods

2.1. Search strategy

The search strategy included primary and secondary sources. The following databases were searched: Medline, Scopus, PubMed, Google scholar, Science direct. Key words used in the primary search were: community pharmacy, community pharmacists, inhaler technique, inhalation technique, COPD management, COPD, medication adherence, respiratory patients. The search was limited to articles written in English language and published in the period from January 2005–February 2015. A manual search of reference lists of primary sources was done to identify any additional studies meeting the inclusion criteria.

2.2. Inclusion and exclusion criteria

The inclusion criteria for this review were: studies in English language and studies with interventions done by community pharmacists (CPs) on COPD patients focusing on IT and MA. Studies including COPD and asthma patients together, and observational studies involving CPs or those conducted in community pharmacy settings were also included. As the last decade has witnessed the implementation of community pharmacy medication management services, in many countries, that targets patients with LTCs [19–21], this review included only studies published after 2005.

The exclusion criteria were; studies not in English language, those published before 2005, studies involving interventions done by other healthcare professionals (HCPs) including clinical pharmacists, studies done by CPs or other HCPs on asthma patients only, studies done by CPs whereby the intervention was not related to IT or MA, reviews, meta-analyses and grey literature.

The excluded studies were as follow: three studies with interventions conducted by clinical/hospital pharmacists on COPD patients, nine studies including both asthma and COPD patients where by the interventions were not done by CPs, two documents that constituted grey literature, one study in Dutch language, and one study with pharmacist-led intervention but focusing on COPD exacerbation management with systemic corticosteroids. A study with intervention done by CPs was excluded to avoid duplication of data since the data was once published jointly with asthma patients and once on COPD patients only. The study pertaining to COPD patients exclusively was included in the review. In addition, 69 studies that were conducted on asthma patients only either by CPs or other HCPs were excluded (Fig. 1).

3. Results

The search of primary sources identified nine articles that met the inclusion criteria; four studies involved COPD and asthma patients and five studies involved COPD patients only. Search of secondary sources identified one additional study including asthma and COPD patients which was included in the review. Thus ten studies were included in this review. Only one study had an intervention involving IT and MA, three studies focused on IT specifically, four studies had an intervention which partly focused on either IT and/or MA and two studies were non-interventional. The steps of the research process for the identification of relevant articles are provided in Fig. 1.

The summary of the studies reviewed in this paper is presented in Table 1.

3.1. Impact of community pharmacists on the management of COPD: review of evidence from Europe

In England, a recent study has shown that a CP-Led COPD service can have a positive, cost effective impact on patients' outcomes. The study evaluated the effect of COPD support service by CPs over six months in 34 pharmacies from four pharmacy chains. CPs were provided with a one-day training course about service delivery along with distance learning materials before the start of the study. The provided service was comprehensive including smoking cessation, education and advice about IT and inhaler checking, provision of support and awareness of symptoms in case of exacerbations and general life-style advice. Initial consultation involved getting baseline data regarding self-reported MA, clinical outcomes, National Health Services (NHS) resource utilisation and quality of life (QoL). All participants (n = 306) had an initial consultation. However, the follow-up frequency was not equivalent for all patients. Monthly consultations for all participants should equate to 1836 consultations over six months; however only 742 consultations were completed. This variation in follow-up cannot be explained by the dropout rate reported as 107 patients. Furthermore, usable data for comparison at baseline and six