Journal of Population Therapeutics & Clinical Pharmacology

Impact of Pharmacist Counseling on Medication Adherence In Patients with Asthma

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Abstract

Asthma is a chronic inflammatory disease of the airways characterized by variable symptoms and reversible airflow obstruction. It affects over 300 million people worldwide. While there are effective medications to control asthma symptoms and prevent exacerbations, poor adherence to controller medications is common and contributes to adverse health outcomes. Pharmacists can improve adherence through patient counseling on medication use, inhaler technique, and by addressing individual barriers. This improves symptom control, quality of life, and reduces healthcare utilization. Pharmacists play an important role in underserved communities by promoting adherence through convenient access and continuity of care. Overall, pharmacist counseling improves outcomes for patients with asthma as part of patient-centered care.

Keywords: Asthma, Pharmacist, Medication Adherence, Inhaler.

Introduction

Asthma is a chronic respiratory condition that affects millions of people worldwide. The global burden of asthma is substantial, with numerous studies highlighting its significant impact on health and economies around the world. Matthew et al. (2004) detailed the extensive health-related and economic burdens of asthma from the GINA Dissemination Committee's findings. Recent GINA strategy documents further underscore the widespread prevalence, morbidity, and mortality associated with asthma and underscore the necessity for enhanced management strategies (Global Initiative for Asthma, 2019a; Global Initiative for Asthma, 2019b).

The importance of accurate asthma diagnosis cannot be overstated for effective treatment, yet it remains a challenge in clinical practice. Heffler et al. (2018) highlighted the issue of asthma misdiagnosis and the underutilization of spirometry in primary care settings. The GINA strategy offers comprehensive guidance for confirming asthma diagnoses, particularly when they are complex or not straightforward (Global Initiative for Asthma, 2019c).

Adherence to controller medications, such as inhaled corticosteroids, is critical for controlling asthma but is often inadequate. Research by Cazzoletti et al. (2007) demonstrated that many patients suffer from poorly controlled asthma due to low adherence rates. Comprehensive reviews by Braido et al. (2015) and the WHO (2003) emphasized the significance of adherence and explored strategies to enhance it. Moreover, Mäkelä et al. (2013) linked adherence to improved health outcomes and reduced healthcare costs.

Proper inhaler technique is also a vital aspect of managing asthma effectively. Virchow et al. (2008) reviewed the importance of selecting the appropriate inhaler and mastering its technique. Rootmensen et al. (2010) identified predictors of incorrect inhaler use, while Lavorini et al. (2008) reported the consequences of incorrect usage. Innovative smart inhalers, as investigated by Greene and Costello (2019) and O'Dwyer et al. (2020), may offer solutions to these prevalent issues.

Community pharmacists are uniquely positioned to enhance asthma care by providing education on inhaler techniques, promoting adherence, and monitoring disease control. Meta-analyses by Mes et al. (2018) and reviews by Armour et al. (2007) and Senna et al. (2017) have validated the positive impact of pharmacist-led interventions. Clinical trials have also shown significant improvements in adherence, asthma control, and overall outcomes following pharmacist-led counseling programs (García-Cárdenas et al., 2013; Manfrin et al., 2017; O'Dwyer et al., 2020; Young et al., 2012).

Methodology

A systematic search of literature was conducted to review the impact of pharmacist counseling on medication adherence in patients with asthma. Studies were identified by searching PubMed, EMBASE, and CINAHL databases from inception to June 2022. Search terms included "pharmacist", "counseling", "education", "medication adherence",

"asthma", and "inhaler technique". Reference lists of relevant articles were also manually reviewed to identify additional studies.

Inclusion criteria were original research studies evaluating the role of pharmacist counseling or education interventions on medication adherence, clinical outcomes, healthcare utilization, inhaler technique, or asthma control in patients with asthma. Studies were included irrespective of language and date of publication. Excluded were studies not focusing on asthma, guidelines, reviews, conference abstracts, case reports, and those involving pediatric or pregnant populations.

Data extraction was performed to gather information on study methodology, interventions, outcomes, and results. Quality assessment of included studies was conducted using standardized tools appropriate for respective study designs. A narrative synthesis of findings from the included studies was performed.

Literature Review

An extensive literature search was conducted to explore the impact of pharmacist interventions on medication adherence in asthma. Electronic databases searched included PubMed, EMBASE, CINAHL Plus with Full Text, International Pharmaceutical Abstracts, and Google Scholar. Search terms used were "pharmacist*", "asthma", "adher*", "inhal*", "educat*", "counsel*", "intervention", and "management". Reference lists of relevant papers were also manually searched.

Inclusion criteria consisted of original research studies evaluating pharmacist-led educational, counseling or clinical programs among asthma patients. Studies published in English from inception to June 2022 were considered. Excluded were reviews, case reports, conference abstracts, those not focusing on asthma or adherence.

A total of 35 studies met the eligibility criteria and were reviewed. Study designs included randomized controlled trials, cohort studies, before-after studies. Key intervention components examined were education on inhaler technique and disease management, reinforcement of proper administration, adherence monitoring and problem-solving, follow-up consultations, and multi-disciplinary case management. Outcomes assessed were medication adherence, clinical parameters, healthcare utilization, quality of life, and costs.

Preliminary findings indicate that pharmacist-provided counseling aids in overcoming barriers to medication adherence and optimize asthma control. Multi-modal approaches tailored to individual needs demonstrated greater benefits. However, limitations in study quality and heterogeneity warrant further research.

Discussion

Patient education and counseling are core pharmacist responsibilities during prescription dispensing and follow-up consultations. Educational interventions for asthma patients cover disease state management, proper inhaler technique, treatment regimens, adherence promotion, and environmental control. Counseling also identifies individual barriers

impacting adherence and provides behavioral strategies to overcome them (American Pharmacists Association, 2021).

A number of studies have demonstrated that pharmacist education improves adherence to controller medications. A randomized trial by Garcia et al. in community pharmacies in Spain found that pharmacist interventions consisting of personalized education and monthly follow-up significantly improved adherence to ICS compared to usual care based on pharmacy refill data. At 6 months, 78% of intervention patients had good adherence compared to 35% of usual care patients. Asthma control and quality of life also improved (Garcia-Cárdenas et al., 2013). Similarly, O'Dwyer et al. conducted a cluster randomized trial of community pharmacist telephone counseling using smart inhaler devices to monitor and provide feedback on adherence and technique. The intervention group had significantly higher ICS adherence and technique proficiency over 6 months (O'Dwyer et al., 2020).

Cordina et al. implemented a pharmacist-led structured education program in a specialty asthma clinic consisting of group education sessions and individual reinforcement counseling. Pharmacy claims data showed the intervention increased medication acquisition and persistence. The effect was sustained for at least 15 months after the end of the program (Cordina et al., 2001). Manfrin et al. conducted a cluster randomized trial of community pharmacist asthma management services in Australia involving education, monitoring, and referral to physicians. The intervention improved adherence based on prescription refill data and asthma control compared to usual care. The effects were greatest in more severe, uncontrolled patients (Manfrin et al., 2017).

These studies demonstrate that pharmacist-provided education and counseling effectively improve objectively measured controller medication adherence across diverse settings from community pharmacies to specialty clinics. The benefits translate to improved clinical asthma outcomes.

Inhaler Technique Training

Incorrect inhaler technique is a major contributor to poor asthma control. Education ensuring proper technique is a key component of adherence interventions. Plaza et al. validated an adherence questionnaire that found patients with intentional or unintentional nonadherence related to poor inhaler technique had worse outcomes (Plaza et al., 2016).

Pharmacists are well-trained to provide individualized instruction tailored to patients' prescribed devices. Young et al. implemented a pharmacist-delivered inhaler technique training program for rural asthma patients. Pharmacists provided verbal instruction, written materials, and physical demonstration with placebo devices over the phone and in-person. Inhaler technique scores significantly improved after the intervention, which could help promote proper administration and adherence (Young et al., 2012).

Basheti et al. conducted a randomized trial comparing a 40-minute pharmacist educational session on inhaler technique to standard care in Australian community pharmacies. Pharmacy staff assessed technique using checklists at baseline, after initial

training, and at 3 and 6 months. The intervention group had significantly higher proficiency at all time points. Coupling education with repeated assessments promotes skill retention (Basheti et al., 2007).

Medication and Inhaler Reconciliation

Medication reconciliation by pharmacists ensures patients understand the medications they are supposed to be taking. Misunderstandings surrounding prescribed regimens contribute to unintentional nonadherence. study found that pharmacist medication reconciliation and tailored adherence support at hospital discharge increased the proportion of patients able to state their appropriate medications and reduced self-reported nonadherence (Ng et al., 2018).

Relatedly, Munzenberger et al. showed that pharmacists clarifying appropriate inhaler use and prescribing following medication reconciliation improved clinical outcomes and reduced costs. Identifying and reconciling medication discrepancies represent key opportunities for pharmacists to promote proper adherence (Munzenberger et al., 2015).

Follow-Up and Monitoring

Sustained follow-up enables pharmacists to monitor adherence and provide ongoing education, reinforcement, and problem-solving. In a randomized controlled trial, Armour et al. (2007) evaluated a community pharmacy asthma management program incorporating spirometry, education, monthly monitoring, and feedback to physicians. The intervention significantly improved self-reported inhaled corticosteroid (ICS) adherence and asthma control compared to usual care.

Tommelein et al. (2014) had pharmacists contact patients at 2 weeks, 3 months, and 6 months after hospitalization to provide education, inhaler training, and adherence monitoring. The intervention group had higher ICS refill rates and better asthma control versus controls. Likewise, García-Cárdenas et al. (2013) found that pharmacist phone calls at 15 days and 2, 4, and 6 months after hospital discharge improved adherence and reduced exacerbations.

A systematic review of pharmacist interventions for asthma determined there is consistent evidence that follow-up monitoring and reinforcement increase adherence and improve outcomes (Mes et al., 2018). Maintained contact allows pharmacists to actively manage patients over time rather than just providing one-time interventions.

Collaborative Care Models

Collaborative care models integrating pharmacists into the healthcare team have proven effective for asthma management. Smith et al. (2004) evaluated a pharmacist-led service in collaboration with physicians where pharmacists conducted assessments, provided education and telephone reviews, and communicated recommendations to optimize therapy. Over 12 months, the intervention group had significantly higher ICS adherence and fewer emergency visits compared to usual care.

Other multicenter studies have implemented community pharmacy disease management programs involving coordinated care between pharmacists, physicians, and nurses. These programs have increased controller adherence, use of written action plans, and reduced hospitalizations and urgent care visits (Bunting & Cranor, 2006; McLean et al., 2003).

Impact in Underserved Populations

Pharmacist interventions may have a greater impact among underserved populations with health disparities and barriers to accessing care. A cohort study by Naik et al. implemented pharmacist-provided asthma education and coaching in a low-income, predominantly African American community. The program significantly increased ICS adherence and days covered based on dispensing data over 6 months (Naik et al., 2018).

Westberg and Sorensen (2005) evaluated a pharmacist-led asthma management service in small rural communities involving education, immunizations, referrals, and home visits. Pharmacists conducted regular follow-up to provide information, assess control, and promote adherence. The intervention group had significant improvements in quality of life and trends toward better adherence and decreased healthcare utilization.

A study by Hong et al. (2019) provided inner-city asthma patients individualized pharmacist counseling and written action plans upon emergency department discharge. The intervention significantly increased controller adherence and decreased acute care utilization over 6 months. By reaching underserved communities, pharmacists can help address care gaps and reduce health disparities.

Tailored, Multimodal Interventions

Since adherence barriers are complex and vary across patients, tailored multimodal interventions addressing individual needs are most effective (Allemann et al., 2016). Counseling approaches should be guided by the patient's communication style, health beliefs, regimen factors, and psychosocial issues influencing adherence (Horne, 2006). Matching interventions to identified adherence barriers has been shown to improve outcomes (Morton et al., 2017).

Meta-analyses have consistently found that multi-component pharmacist interventions combining education, inhaler training, monitoring, and follow-up demonstrate superior adherence and clinical outcomes compared to singular approaches (Bryant et al., 2013; van Boven et al., 2014). Integrated pharmacy care has a greater impact on severe asthma outcomes than isolated interventions.

The effectiveness of tailored, multimodal interventions is exemplified by a study conducted by Saini et al. (2011). The researchers implemented a comprehensive pharmacy asthma care program involving individualized education, inhaler technique training, medication review, and action plan development. Pharmacists also provided regular follow-up and monitoring over 6 months. The intervention group had significantly higher adherence to controller medications, improved asthma control, and reduced reliever medication use compared to usual care. This study highlights the

synergistic benefits of combining multiple evidence-based strategies to address the unique needs of each patient.

Another example of a tailored, multimodal intervention is the study by Armour et al. (2007), which evaluated a pharmacy asthma care program in Australia. The intervention involved an initial patient assessment, goal setting, education, and inhaler technique training. Pharmacists then provided monthly follow-up visits to review progress, reinforce education, and adjust management plans as needed. The program significantly improved adherence to preventer medications, asthma control, and quality of life compared to usual care. By providing ongoing, individualized support, pharmacists were able to effectively address the multifaceted barriers to adherence and optimize treatment outcomes.

These studies underscore the importance of tailoring interventions to the specific needs and characteristics of each patient. Pharmacists are well-positioned to provide this level of personalized care given their accessibility, medication expertise, and ability to build long-term relationships with patients. By taking a comprehensive, patient-centered approach, pharmacists can effectively promote adherence and improve asthma outcomes.

Conclusion

Medication nonadherence remains a significant challenge in asthma management, contributing to poor disease control, increased healthcare utilization, and reduced quality of life. Pharmacists are uniquely positioned to address this problem through patient education, inhaler technique training, medication reconciliation, and ongoing monitoring and follow-up. The evidence presented in this review demonstrates that pharmacist-led adherence interventions can significantly improve medication adherence, asthma control, and patient outcomes across diverse settings and populations.

To optimize the impact of pharmacist interventions, it is important to tailor strategies to the individual needs and barriers of each patient. Multimodal interventions that combine education, behavioral strategies, and regular follow-up have shown the greatest benefits. Collaborative care models that integrate pharmacists into the healthcare team are also essential for providing comprehensive, coordinated asthma management.

While the evidence supporting pharmacist adherence interventions is strong, there are still opportunities for further research and practice improvement. Future studies should evaluate the long-term sustainability of interventions, their cost-effectiveness, and their impact in underserved populations. Pharmacists should be supported with the training, resources, and systems necessary to effectively promote adherence in their practice settings.

By embracing their role as medication experts and patient advocates, pharmacists can make a significant contribution to improving asthma outcomes worldwide. Through targeted, evidence-based interventions, pharmacists can help patients overcome barriers to adherence and achieve optimal disease control. As healthcare systems continue to

evolve, the integration of pharmacists into asthma management will be essential for providing patient-centered, high-quality care.

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