

An Evaluation of Medication Therapy Management with Blister Packaging on Optimization of Care for Patients with Hyperlipidemia and Hypertension

Introduction

Cardiovascular disease remains the leading cause of death for men and women in the United States.¹ It is reported that over 60% percent of patients with cardiovascular disease are non-adherent to medications. In fact, many patients discontinue the use of antihypertensive medications (up to 50%) or statin medications (up to 40%) within 2 years of hospital discharge following an acute coronary syndrome event.² Patients with hyperlipidemia who are non-adherent to statins are 26% more likely to be hospitalized for cardiovascular-related events than patients who are adherent.³ Patients who are not adherent to their antihypertensives have a 74% higher risk of all-cause mortality and 47% higher risk of all-cause hospitalization.⁴

Lack of optimization of medication therapy, which includes medication nonadherence, leads to avoidable financial burdens on the healthcare system. Other factors which lead to non-optimization of medication therapy include other drug-therapy problems such as subtherapeutic dosing, untreated indications, and drug interactions. Non-optimization of medication therapy ultimately leads to increased morbidity and mortality due to treatment failure. A 2016 study estimated that the annual cost of drug-related morbidity and mortality due to nonoptimized medication therapy was \$528.4 billion, which is equivalent to 16% of US health care expenditures in 2016. In the interest of both patient care and minimizing healthcare expenditure, there is a clear need for processes and tools to maximize medication therapy for patients and increase their medication adherence.⁵

One mechanism to increase medication adherence is through preparing medications in adherence packages, as it prevents the patient from having to open multiple medication bottles several times per day. Available literature regarding blister packaging suggests that it has a positive impact on rates of medication adherence. However, few studies have been able to evaluate the impact that the combination of blister packaging with medication therapy management (MTM) has on health outcomes. Pharmacists provide MTM with the goal of optimizing drug therapy and improving health outcomes for patients by providing a range of services. These services may include performing comprehensive medication reviews (CMRs), monitoring drug efficacy and safety, improving medication adherence through targeted interventions, and communicating interventions and MTM outcomes with the prescriber.⁶

Studies, like reports from the Asheville Project, have shown the benefit MTM has on patients with hypertension and dyslipidemia. A subset of this project aimed to show the benefit of clinical pharmacists on clinical and economic parameters related to cardiovascular disease. Through long-term follow-up, recommendations made to physicians, and monitoring by community and hospital pharmacists, patients had significant reductions in blood pressure, lipids, and in overall cardiovascular events. Additionally, cost of care was significantly reduced. While use of medications to treat cardiovascular disease increased threefold, the cost related to cardiovascular events decreased by 46.5%.⁷ However, this study did not comment on the structure of how recommendations were made to providers and the rate of acceptance of recommendations. For community pharmacists, the ability to optimize a patient's medication therapy may be limited by acceptance of the recommendation by a provider. In general, the literature has shown this average rate of acceptance to be around 50%.⁹

Another study, which provided MTM to Medicaid patients enrolled in an adherence packaging program, demonstrated that the service resulted in higher rates of medication adherence. There was no impact on overall healthcare utilization and non-pharmacy costs between the blister packaging group and usual care group. Additionally, only 3.8% of drug therapy problems identified during MTM were resolved by the end of the study period.⁸ The authors hypothesized that a population with more health seeking behaviors, such as the Medicare Part D and geriatric population, might find more benefit from the MTM program.

Enrolling and monitoring patients in an adherence packaging service provides many opportunities to provide medication therapy management services and optimize patient care. By providing medication therapy management for a patient utilizing monthly adherence packaging, the pharmacist is not only ensuring that the patient is taking the medication correctly, but that the medication they are taking is providing optimal benefit. There is a gap in the literature evaluating this subset of patients and the response to recommendations made to prescribers and patients while providing these services.

Methods

Study Design and Setting: This is a retrospective review of data collected from patients of this clinical service which took place at an independently owned pharmacy in North Carolina.

Participants: This study will include a review of all participants with hypertension and/or hyperlipidemia who received a CMR while enrolled in the blister pack program.

Procedures: Realo in New Bern established a collaborative relationship with the North Carolina Department of Health and Human Services (NC DHHS) to provide MTM to patients with hyperlipidemia and hypertension. This service was reimbursable by a grant to NC DHHS from the Center for Disease Control (CDC). Realo delivered the MTM services to patients with hypertension and/or hyperlipidemia who were enrolled in or being initiated in the adherence packaging program. The clinical pharmacists involved in this project each have 25% of their weekly time dedicated to providing this service with the goal to optimize care for these patients. Patients were referred to the clinical pharmacists from four Realo locations in New Bern, NC, one location in Wallace, NC, one location in Jacksonville, NC, and one location in Greenville, NC to be managed in this program.

During the CMR for this study, patients were counseled on each of their medications and were provided information about lifestyle modifications to reduce cardiovascular disease risk. All patients were asked about their smoking status and were provided counseling on smoking cessation, when necessary. Patients with hypertension were encouraged to regularly monitor their blood pressure at home and were provided education on their goals of therapy. Patients who stated they would be willing to monitor their blood pressure at home but were unable to afford a blood pressure monitor were provided a free blood pressure monitor paid for by an APhA Community Pharmacy Foundation Incentive Grant received by Realo. Patients were also asked questions regarding their cardiovascular disease history, including past heart attacks and/or strokes, presence of diabetes, and the presence of other clinically diagnosed ASCVD. Following the CMR, the pharmacist attempted to obtain results from a recent lipid panel for each patient. This was used to calculate the patient's 10-year ASCVD risk as well as to support any recommendations in changes to antihyperlipidemic therapies.

The clinical pharmacist provided recommendations, as needed, to the appropriate prescriber to optimize drug therapy. These recommendations were communicated via phone call, fax, or message through the electronic health record (for certain prescribers). Medications that were specifically

targeted in this study included aspirin, antihypertensives, or antihyperlipidemic agents. However, the pharmacist also made other therapeutic recommendations, as appropriate, to optimize overall care.

Patients included in this project received an additional follow-up 6-months after the CMR to determine if they had any further needs for optimization of care. This included following up on pertinent monitoring parameters, such as a lipid panel or blood pressure reading, documenting and providing education on changes in medications, and documenting the occurrence of a new cardiovascular event.

Data for this study was recorded in an intervention tracking system and worksheet utilized by the pharmacist during the medication review which addressed:

1. Smoking status and willingness to quit, if applicable
2. Willingness to monitor blood pressure at home, when applicable
3. Body mass index (BMI)
4. 10-year ASCVD risk calculation utilizing the ACC/AHA risk score calculator
5. Statin and antihypertensive use
6. Baseline and 6-month blood pressure readings
7. Baseline and follow-up lipid panels, if available
8. Barriers to medication adherence
9. Recommendations made to the prescriber related to antihypertensives, aspirin, and antihyperlipidemics and response to those recommendations
10. Classes of antihypertensives and antihyperlipidemic agents prescribed to patients
11. Past myocardial infarction and/or stroke or other clinically diagnosed ASCVD
12. Presence of other risk-enhancing factors (diabetes, chronic kidney disease, inflammatory disease)
13. Baseline demographic information (age, weight, height, race, and gender)

The primary aim was to evaluate acceptance of recommendations by prescribers and patients with hyperlipidemia and/or hypertension made pursuant to a CMR and blister pack initiation. Prescriber recommendations included those related to medication agents such as aspirin or statins (i.e., initiation, discontinuation, or dose adjustments). Patient recommendations included home blood pressure monitoring and smoking cessation, as appropriate.

De-identified data was exported to a Microsoft Excel spreadsheet for analysis. Descriptive statistics were used to determine baseline characteristics and to calculate the percentage of recommendations accepted by prescribers and patients.

Results and Discussion

There were 127 patients who received MTM services along with adherence packaging during the study period. Baseline characteristics are listed in Table 1. The majority of patients were white and female, with half of the patients having the risk-enhancing factor of being diagnosed with diabetes. Ninety-five (75%) of patients were at or below their blood pressure goal at the time of inclusion in the study.

In total, 81 cardiovascular disease-focused recommendations were made to prescribers following a CMR with a patient enrolled in adherence packaging services (figure 1). These recommendations were focused on use of aspirin, change in an antihypertensive agent, or a change in an antihyperlipidemic agent. Change in an antihypertensive agent could be a recommendation to add on to current therapy or

to decrease/discontinue current therapy. Notably, 77% (10 out of 13) of recommendations regarding an antihypertensive were accepted by a prescriber, with the majority of those recommendations (61%) being to add on to current therapy. Recommendations to optimize antihyperlipidemic therapy were to modify the patient's drug regimen according to current ACC/AHA guideline recommendations. Less than half (30%) of these recommendations were accepted. Additionally, recommendations were made regarding appropriateness of aspirin use based on recent guideline updates. Fifty-two percent of these recommendations were accepted, with the majority of these recommendations being to discontinue aspirin that was being used inappropriately, based on current guidelines.

Fifteen patients reported smoking tobacco products, and seven (47%) were willing to quit smoking following the CMR with the clinical pharmacist (figure 2). Sixty-two patients reported already monitoring their blood pressure at home prior to the CMR. Of those who did not already monitor at home, 37 (54%) patients agreed to start checking their blood pressure at home following the medication review.

About 43% of all cardiovascular disease-focused recommendations made were accepted by prescribers. According to the literature, acceptance of pharmacist recommendations by a prescriber averages to around 50%. While the overall acceptance of recommendations is lower than this average, acceptance for a change in aspirin (51%) and a change in an antihypertensive agent (77%) from this study are higher than this average. The overall rate of acceptance is significantly reduced by an acceptance rate of 30% for recommendations regarding an antihyperlipidemic agent. The high rate of acceptance for a change in an antihypertensive agent may indicate that prescribers are more willing to make a change based on an objective measurement reported by a pharmacist, such as blood pressure, than guideline-based recommendations

A little less than half (47%) of patients who reported using tobacco products agreed to quit using tobacco products after counseling during a CMR. For many smokers, it may take 30 or more quit attempts before they finally quit smoking. It is important to provide education and resources to patients who use tobacco products during interactions to help them become ready to quit. Patients in this study were more likely to accept the recommendation to monitor their blood pressure at home than to decline. These values can be tracked by the patient and reported to the physician to help adjust drug therapy. When communicated by a pharmacist following a CMR or follow-up phone call, this can help to avoid a visit to a physician's office while optimizing care for the patient.

Overall, about 31% (40 of 127) of patients had a change to their medications based on a recommendation made by a clinical pharmacist. This includes medication changes that were made beyond the scope of cardiovascular disease. When enrolling patients in an adherence packaging program, it is important to not only make sure that pharmacists are providing patients with a means to organize their medications and improve their medication adherence, but to also ensure that the medications that are being packaged are therapeutically appropriate to ensure optimal patient outcomes.

This clinical service was made possible by a grant funding 10 hours of pharmacist time per week to manage patients with hypertension and hyperlipidemia who utilize blister packs. A limitation to implementing this comprehensive service in other settings is the lack of reimbursement to fund time for a dedicated clinical pharmacist. On average, the clinical pharmacist spent about ten hours per week completing the CMRs and following up with providers for 3-4 patients. In many community pharmacy settings, it is unrealistic to expect that amount of time to be spent on MTM services without a reimbursable model for pharmacist time. Another limitation to the applicability of the results of this

study to other pharmacies include the relationship between the pharmacists and local providers. Through a collaborative partnership, some Realo pharmacists have access to the electronic health record and are able to directly message the providers. Additionally, the pharmacists are able to access a more complete history of the patient through chart notes and lab values to provide a stronger recommendation. Many pharmacies do not have this direct access to a patient's chart and prescriber to convey recommendations.

Conclusions

Pharmacists should include an assessment of factors for cardiovascular disease when enrolling patients in adherence package programs and providing medication therapy management. This may aid in the optimization of lifestyle and medication therapy to improve patient outcomes. Potential areas of study should focus on the impact of the monthly follow-up involved in carrying out an adherence packaging program and the addition of questions to monitor disease states. Pharmacists are able to provide care between office visits, and adherence packaging programs provide an appointment-based model to provide those follow-ups. From this experience, prescribers were more likely to accept recommendations related to the optimization of medication therapy for hypertension than to adjusting regimens to be in accordance with current practice guidelines. Future projects could focus more specifically on monthly follow-up for blood pressure readings to continue to monitor and optimize care for that patient group.

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