Improving Medication Adherence through Collaboration between Colleges of Pharmacy and Community Pharmacies

Megan Willson, PharmD, BCPS; Catrina Schwartz, PharmD, BS; Jennifer Robinson, PharmD
Spokane, WA
July, 2013

BACKGROUND

Poor adherence to drug therapy is a well recognized problem contributing to worsened health outcomes and spending inefficiencies. Examples of sub-optimal medication adherence include not filling or refilling a prescription, stopping the medication prior to completing the course, taking more or less than prescribed, and taking the medication at a wrong time. Improper medication adherence can be both intentional and unintentional.[1] Non-adherence rates are estimated to range from 41-74% in the elderly. Additionally about one quarter of the population is non-adherent to medication therapy after six months.[1,2,3] Adherence to a medications decline as the duration of time receiving therapy increases, making adherence to medication therapy crucial in chronic disease states.[3] Poor medication adherence results from multiple barriers including drug cost, side effects, and patients' lack of understanding of their disease and the complexity of medication regimens.[1,2,3] Consequences of medication non-adherence include worsened disease outcomes, unnecessary hospitalizations and increased health care expenditures.[3] Mortality rates rise along with number of hospitalizations for patients with poor adherence, translating to an increased cost of care. Current estimates suggest that annual expenditures of 290 billion dollars are spent unnecessarily due to poor medication adherence.[3] Combined with the serious consequences of medication non-adherence and the predicted increase in drug cost, many health professionals are in search of a solution to increase patient adherence with medications.

Research shows that medications specifically for hyperlipidemia can decrease events from cardiovascular disease and stroke.[4,5] Knowing the rate and consequences of non-adherence and barriers to adherence, makes targeting the patient prior to experiencing a poor outcome from non-adherence a priority. Community pharmacists are in a key position to resolve many of the identified barriers to adherence due to their insight into medication regimens and ease of accessibility. Strategies to improve adherence have involved regimen simplification, personalized patient education, manual telephone contact, automated contact, reminders for refills, appointments, and medication adherence support. To be effective in improving adherence and disease outcomes, historically, effective interventions often required complex and time consuming activities.[6]

The goal of this project is to create a reproducible model that pairs student pharmacists with community pharmacist mentors to improve medication adherence through personalized telephone calls utilizing medication and disease state counseling, medication regimen management, and motivational interviewing techniques. In addition to the targeted outcome of improved medication adherence for patients, other potential values could include developing enhanced rapport, increased patient loyalty, and decreased overall healthcare expenditures through pharmacist interventions. Through enhanced pharmacist-patient relationships, further pharmacy care services could be utilized by taking advantage of increased pharmacy visits.

METHODS

The study will be a randomized controlled, prospective trial comparing pharmacy standard of care to student pharmacist-lead telephone coaching and disease state management. All individuals will be recruited from Sixth Avenue Medical. Patients were enrolled into the study from April 23, 2012 to September 7, 2012. Study intervention was completed on December 27, 2012. All individuals enrolled signed an informed consent and were recruited by direct personal contact in the pharmacy and informational mailers. Patients were eligible for enrollment if they were identified by a medication profile which included medications for treatment of hyperlipidemia including HMG-CoA reductase inhibitors, fibric acid derivatives, niacin and bile acids sequestrants by either the pharmacist or by participant self-identification. Individuals were randomly assigned to either arm by a 1 to 1 allocation by drawing a number out of a hat. The effect size equaled 0.27 assuming 15% reduction in medication adherence and 80% power with 41 individuals.

Telephone coaches were students recruited from the second year Doctor of Pharmacy program at Washington State University who had: 1) successfully completed a course in communications, including motivational interviewing, 2) successfully completed training about hyperlipidemia and dietary management, 3) display strong problem solving skills, and 4) display a commitment to educating patients. After selected to be a telephone coach the student was further trained in Motivational Interviewing, management of hyperlipidemia and medication adherence. The additional training in the management of hyperlipidemia included dietary and exercise modifications along with medications. Also a refresher was provided on motivational interviewing.

The intervention consisted of three telephone calls conducted by the student pharmacist. The first telephone call included information on the importance to take medicines properly, general hyperlipidemia information, and self-care measures to improve cardiovascular health including diet and physical activity and a refill reminder. The following two phone calls will included reminders to refill medications along with individualized conversations based on participants' needs to improve adherence to medications or reach dietary or physical activity goals.

The main outcomes measures for to assess medication adherence was medication refill and cholesterol levels. Each arm of the study received a lipid profile including total cholesterol and high density lipoprotein (HDL) at the beginning of the student and at the conclusion of the study. A complete medication profile for 2012 was obtained for all patients and a medication possession ratio (MPR) was calculated for pre-study and during the study intervention. The MPR was calculated by totaling the days supply for the specified time period divided by the actual number of days elapsed.[7] Both groups received ASK20 questionaire, SEAMS questionaire, Newest Vital Sign health literacy assessment, disease knowledge assessment upon initiation of the study. Then at the conclusion of the study each group received the ASK 20 questionaire, SEAMS questionaire, disease knowledge assessment and a satisfaction survey.

The descriptive statistics were analyzed with computed percentages for categorical variables and means and standard deviations for continuous variables. Second, to check that the randomization was successful, chi square tests were used to examine whether the categorical demographic variables were significantly different between the two groups, and independent samples t-tests to

examine whether continuous variables were significantly different between the two treatment groups. Third, when analyzing an outcome variable such as MPR both before and after the intervention, we used repeated measures ANOVA in order to examine the effect of 1) trial arm on the outcome (e.g., MPR), 2) change in the outcome from before the intervention to after the intervention, and 3) the interaction of change over time by treatment arm. Lastly, when testing for differences on continuous variables (e.g., cholesterol and MPR) at baseline or at the end of the study, we utilized independent samples t-tests in order to know whether there was a significant difference between the two treatment arms at one point in time.

RESULTS

Forty two patients were enrolled in the study. One patient withdrew consent, and 4 patients were unable to be reached by telephone to schedule for initial appointment. One patient was unable to complete final study analysis. Patient baseline characteristics were similar between both groups. Fifty-one percent of the sample was assigned to the standard of care arm. Forty-nine percent of the patients were male and 92 % of the sample was white. Per patient report 76% of the sample was non-smokers and 67% have been to college. Reported significant past medical history include a 16.2% history of stroke, 18.9% history of myocardial infarction, 24.3% history of diabetes mellitus, and a 59.5% history of hypertension. The average age for patients enrolled was 65.49 years.

The primary outcome for cholesterol and medication adherence calculated by the MPR did not differ per group over time. Mean baseline total cholesterol level was 171.81 mg/dL (SD 42.515). Baseline total cholesterol measure didn't differ between groups (p=0.759). The interaction between the telephone intervention over time did not demonstrate a difference in total cholesterol (p=0.795) or MPR (p=0.238) for cholesterol medications. No change was demonstrated in HDL over time per intervention group (0.575).

Secondary analysis of all medications showed no difference between groups (p=0.924) over time, however, patients had a significantly higher MPR for cholesterol medications compared to overall medication MPR (p=0.029) prior to the intervention of 0.38 and 0.26 respectively. The correlation of the two MPR remained after the study with a significantly lower all medication MPR compared to a cholesterol medication MPR (p=0.017) with 1.13 and 1.26 respectively.

Other secondary analysis included a review of the impact of health literacy, cholesterol knowledge, and self-efficacy. Health literacy for the patients found no correlation with total cholesterol or household income. Low health literacy was significantly correlated with education level (p=0.027). Cholesterol knowledge at initiation of the study demonstrated that high cholesterol can cause heart disease and stroke, 94.3% and 82.9% respectively. Only 71.4 percent of patients knew that they would likely need to take cholesterol medications lifelong. Approximately half of the patients (51.6%) knew that low density lipoprotein (LDL) was bad cholesterol. Fifty-seven percent of patients know what to do to lower their cholesterol. Knowledge about foods with high cholesterol was answered correctly by 74.3% of patients. Only 16.7% of patients knew what a good total cholesterol level was. The change in total percent correct per arm over time was significantly different with the standard of care arm have a significantly better cholesterol knowledge (p=0.041). See graph 1. The SEAMs for taking medication sunder difficult circumstances showed no difference between groups over time

(p=0.740). SEAMs for taking medications under uncertain or changing circumstances was significantly increase from beginning to the end of the study (p=0.031), but there was no difference between groups overtime (p=0.503).

Five students participated in the medication adherence study calling 3 to 4 participants each. Initially students agreed with being confident in their preparation to interact with patients, ability to communicate effectively and to work collaboratively. Decreased confidence was seen in use of motivational interviewing. After study completion 4 of the 5 students strongly agreed with feeling confident to communicate with patients and all students felt confident with motivational interviewing. No change was found in number of identified barriers to medication adherence.

The satisfaction survey for the telephone intervention group reported that 72% reported that the cholesterol coach talked about how he or she can better control my cholesterol either most of the time or all of the time. Patients reported talking about changes most of the time or all of the time only 44%. Eighty-three percent of the patients reported the coaches to be easy to understand and respectful most or all of the time. Eighty-three percent of the patients reported the guidance provided by the coaches to be very unhelpful or somewhat unhelpful. When asked in the telephone group 38.9% were neutral, 38.9 would not and 22.2% would use this service on whether they would use a telephone service if it were available. For the standard of care group 5.6% was neutral, 55.6% would not, and 38.8% would use a telephone service.

CONCLUSION

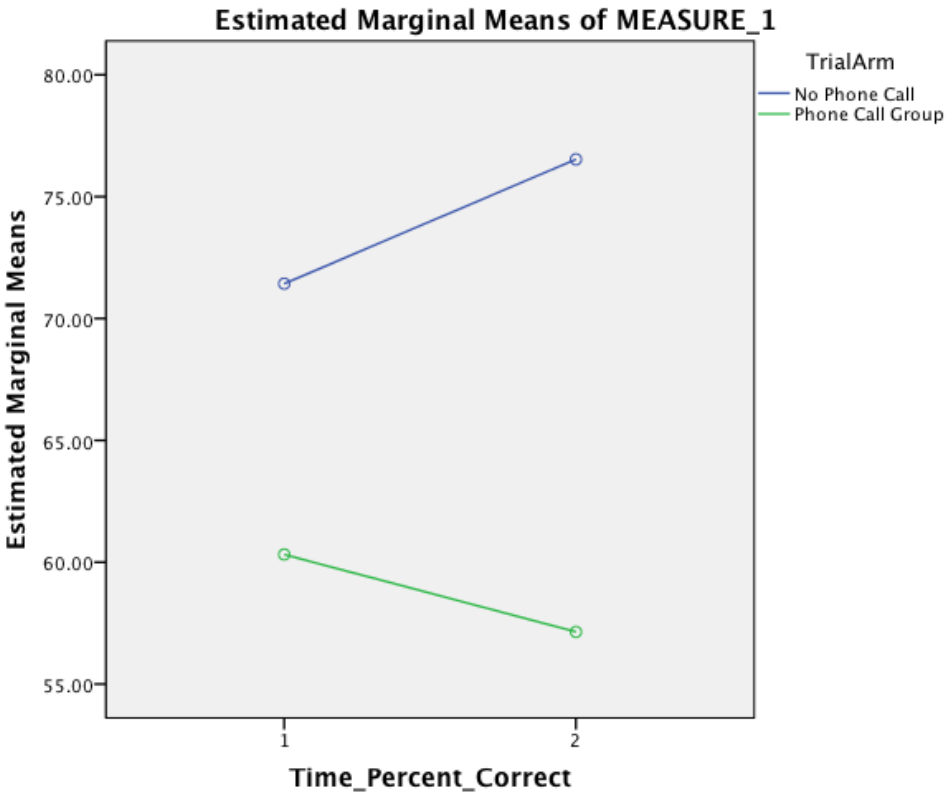
No significant differences were seen in the primary objectives of reduction of cholesterol levels or medication adherence. While no differences were found the study was only powered to see a moderate effect on medication adherence and medication adherence was higher than expected. However a significant difference was seen with total MPR to cholesterol MPR. Further analysis will be conducted to see what is causing this effect. This effect is somewhat expected as number of medications increase adherence decreases.

A major limitation to the study was being able to reach the individual by telephone at the time the telephone call center was open for students. Frequent attempts were made by the student pharmacist to reach the individual. This could have potentially affected the ability of the student to remind the individual that the medication needed to be refilled.

Cholesterol knowledge improved in the standard of care arm but not in the telephone intervention arm. This result is felt to be unreliable due to missing values in repeat measurement at the end of the study. However, the results for cholesterol knowledge were lower than expected. The lack of knowledge indicates that the pharmacist needs to continue to talk to patients about their cholesterol medications.

REFERENCES

1. “Adult meducation: Improving medication adherence in older adults.” American Society on Aging and American Society of Consultant Pharmacists Foundation. 2006. http://www.adultmeducation.com/index.html
2. Balkrishnan R. Predictors of medication adherence in the elderly. Clinical Therapeutics. 1998;20(4):764-71.
3. “Thinking outside the pillbox: A system-wide approach to improving patient medication adherence for chronic disease.” New England Healthcare Institute. August 2009.
4. Amerenco P, Boguslavsky J, Callahan A, et al. High dose atorvastatin after stroke or transient ischemic attack. N Engl J Med 2006;355:549-59.
5. Cannon CP, Braunwald E, McCabe CH, et al. Intensive versus moderate lipid lowering therapy with statins after acute coronary syndromes. N Engl J Med 2004; 350:1495-1504.
6. Haynes RB, Ackloo E, Sahota N, et al. Interventions for enhancing medication adherence (Review). The Cochrane Library.2008;4.
7. Krousel-Wood M, Islam T, Webber LS, et al. New medication adherence scale versus pharmacy fill rates in hypertensive sentiors. Am J Manag Care. 2009;15(1):59-66.


Estimated Marginal Means of MEASURE_1
TrialArm
No Phone Call
Phone Call Group
Estimated Marginal Means
80.00
75.00
70.00
65.00
60.00
55.00
1
2
Time_Percent_Correct