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Effect of pharmacist care on medication adherence and cardiovascular outcomes among patients post-acute coronary syndrome: A systematic review

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ABSTRACT

Background: The impact of collaborative and multidisciplinary health care on the outcomes of care in patients with acute coronary syndromes (ACS) is well-established in the literature. However, there is lack of high quality evidence on the role of pharmacist care in this setting.
Objective: This systematic review aimed to evaluate the impact of pharmacist care on patient outcomes (readmission, mortality, emergency visits, and medication adherence) in patients with ACS at or post-discharge.
Methods: The following electronic databases and search engines were searched from their inception to September 2016: PubMed, EMBASE, Cochrane Central Register of Controlled Trials, ISI Web of Science, Scopus, Campbell Library, Database of Abstracts of Reviews of Effects (DARE), Health System Evidence, Global Health Database, Joanna Briggs Institute Evidence-Based Practice Database, Academic Search Complete, ProQuest, PROSPERO, and Google Scholar. Studies were included if they evaluated the impact of pharmacist's care (compared with no pharmacist's care or usual care) on the outcomes of rehospitalization, mortality, and medication adherence in patients post-ACS discharge. Comparison of the outcomes with relevant statistics was summarized and reported.
Results: A total of 17 studies [13 randomized controlled trials (RCTs) and four non-randomized clinical studies] involving 8391 patients were included in the review. The studies were of variable quality (poor to good quality) or risk of bias (moderate to critical risk). The nature and intensity of pharmacist interventions varied among the studies including medication reconciliation, medication therapy management, discharge medication counseling, motivational interviewing, and post-discharge face-to-face or telephone follow-up. Pharmacist-delivered interventions significantly improved medication adherence in four out of 12 studies. However, these did not translate to significant improvements in the rates of readmissions, hospitalizations, emergency visits, and mortality among ACS patients.
Conclusions: Pharmacist care of patients discharged after ACS admission was not associated with significant improvement in medication adherence or reductions in readmissions, emergency visits, and mortality. Future studies should use well-designed RCTs to assess the short- and long-terms effects of pharmacist interventions in ACS patients.

1. Introduction

Cardiovascular diseases (CVDs) are among the leading causes of death globally. In 2012, it was estimated that 17.5 million deaths were attributable to CVDs. Coronary heart diseases (CHD) including acute coronary syndromes (ACS) were responsible for 7.4 million of these deaths.[1] Patients with established CHD are at an increased risk of future cardiovascular events including acute myocardial infarction (AMI) and stroke. The median 30-day readmission rate for AMI was reported to be as high as 20%.[2] As a result, patients post-ACS should receive secondary prevention interventions to prevent the recurrence of cardiovascular events. These interventions include medications and therapeutic lifestyle changes.[3]

Evidence-based clinical practice guidelines recommend that

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upon discharge, all patients post-ACS should receive life-long treatment with secondary cardioprotective medications including antiplatelets, angiotensin converting enzyme (ACE) inhibitors or alternatively angiotensin II receptor blockers (ARBs), β-blockers, and statins, unless contraindicated.[3–6] These preventive medications have been shown to decrease the risk of recurrent cardiovascular events, rehospitalization, and mortality.[3,7] However, patients' adherence to these medications has been reported to be generally poor.[8–11] In addition, underutilization of this evidence-based therapy has also been reported in the literature.[12–15] Previous studies have demonstrated that non-adherence to and underutilization of secondary prevention therapy after ACS hospital discharge were strongly associated with an increased risk of future cardiac-related hospitalizations and mortality.[8–10,16,17] Therefore, it is imperative to implement interventions to improve medication adherence and utilization among these high-risk patients.

Studies among patients with recent ACS hospitalization have demonstrated the benefits of interventions provided by pharmacists and other healthcare providers in improving adherence and other outcomes. In particular, the evidence supports that restructuring the patient discharge process to include activities such as discharge medication reconciliation and counseling, and post-discharge follow-up and monitoring, can potentially decrease the incidence of adverse outcomes post discharge.[18–20] Different models of care including multidisciplinary, multifaceted, and patient-centered strategies have been used in this setting. Notably, pharmacists have been involved in the care of ACS patients post-discharge either as sole providers or as part of multidisciplinary teams. In addition to dispensing medications, pharmacist's roles include, but are not limited to, medication reconciliation, promoting proper medication use, discharge patient counseling, supporting self-care, and post-discharge follow-up.[21]

A few well-designed studies have been conducted to evaluate the effectiveness of pharmacist-provided, patient-centered interventions aimed at improving medication adherence and outcomes among patients post-ACS hospitalizations. These studies have assessed different outcomes including adherence, readmission, and mortality rates. However, the findings and effect estimates varied widely, making it challenging to determine the rates across studies and to draw solid conclusions.

Moreover, previous systematic reviews have evaluated the impact of pharmacist care on secondary prevention of CHD in general and on the management of major CVD risk factors.[22,23] Cai et al. carried out a systematic review to evaluate the effect of pharmacist care on mortality, morbidity, and CHD management. The review included five randomized controlled trials (RCTs) and concluded that there was no significant effect of pharmacist care on mortality, recurrent cardiac events or hospitalization in CHD patients.[22] Similarly, Santschi et al. conducted a systematic review to determine the impact of pharmacist care on the management of adult outpatients with cardiovascular disease risk factors. In this review, pharmacist care was associated with significant reductions in blood pressure, total cholesterol, low-density lipoprotein cholesterol and risk of smoking.[23]

A more recent systematic review had evaluated the effects of pharmaceutical care on outcomes among heart failure (HF) and ACS patients in varying settings including in-hospital, outpatient clinic, and community pharmacy. This review included six studies for patients with ACS and two for patients with CHD and concluded that the evidence was not strong enough to confirm the effect of pharmaceutical care on patient related outcomes.[24]

To our knowledge, no systematic reviews have been conducted to specifically synthesize and summarize the existing evidence in relation to the impact of pharmacist care among ACS patients at or post-discharge. We pose the question “Does pharmacist care (e.g. medication education, reconciliation, lifestyle education, and follow-up) in patients with recent ACS hospitalization improve adherence rates, prevent future CV events, decrease hospital readmission and mortality rates, and decrease medication adverse events?”

The objectives of this systematic review are to (1) determine the extent and evaluate the quality of pharmacist intervention studies for patients post-ACS; (2) synthesize and summarize the available evidence and possibly estimate overall rates of readmissions and mortality.

2. Material and methods

This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement.[25] The full protocol is available in the International Prospective Register of Systematic Review (PROSPERO): CRD42016039885.[26]

2.1. Data sources and search strategy

We conducted a comprehensive and explicit search through the following databases and search engines from their inception to September 2016: PubMed, EMBASE, Cochrane Central Register of Controlled Trials, ISI Web of Science, Scopus, Campbell Library, Database of Abstracts of Reviews of Effects (DARE), Health System Evidence, Global Health Database, Joanna Briggs Institute Evidence-Based Practice Database, Academic Search Complete, ProQuest, and PROSPERO. In addition, Google Scholar was used to capture the gray literature and any other additional studies using all the relevant search terms connected by Boolean operators. We also manually searched the bibliographies of original research and review articles retrieved electronically. Language and date restriction were not applied in this search.

The search strategy included disease-related terms (e.g. acute coronary syndromes, ACS, myocardial infarction, MI, ST elevation myocardial infarction, STEMI, non-ST elevation myocardial infarction, NSTEMI, unstable angina, UA, angina, heart attack); pharmacist care-related terms (e.g. pharmacist intervention, pharmacist, pharmaceutical care, clinical pharmacy service, pharmaceutical service, counseling, education, care plan, follow-up); cardioprotective medications-related terms (e.g. secondary prevention, cardioprotective therapy, ACEI, β-blocker, aspirin, statins, ARB, clopidogrel, anti-platelet); outcomes-related terms (e.g. medication adverse event, adherence, non-adherence, recurrent CV events, hospital readmission, all-cause hospitalizations, mortality); and the study design-related terms (randomized controlled trials, RCT, non-randomized controlled study, comparative study, experimental study, cohort study). Table 1 provides more details about the search items. Search terms were combined from the different categories using Boolean connectors. Modifications and variations were applied based on individual databases (e.g. using MeSH terms and Emtree in PubMed and EMBASE databases, respectively).

2.2. Study selection

Articles were included if they fulfilled all of the following eligibility criteria: (1) the study population included patients recently hospitalized for ACS (STEMI, NSTEMI/UA) and discharged from the hospital; (2) RCT, non-randomized control trial, prospective observational study, or quasi-experimental study reporting post-discharge care (e.g. education, counseling, reconciliation, follow-up services) for patients recently diagnosed with ACS (STEMI, NSTEMI/UA); (3) care provided involved pharmacist (e.g. pharmacist-directed care or multidisciplinary team including

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