Pharmaceutical Care in Chronic Coronary Artery Disease Management

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KEYWORDS

Vaccines, Immunizations, Preventive Aspects, Pharmaceutical Care

ABSTRACT

Individuals who suffer from Acute Coronary Artery Disease (CAD) frequently experience related issues, either because of the illness itself or as a side effect. Despite the existence of established criteria, Drug-Related Problems (DRPs) are more likely to arise, which impairs therapy outcomes and overburden patients. The purpose of this study is to assess clinical pharmacist-initiated medication optimisation in ACS patients. In order to optimise pharmacotherapy and the patient care process, a comprehensive clinical pharmacy service was created and deployed for the management of acute coronary syndrome (ACS-CPS). The service activities were prototyped under four primary themes. Our research showed the proactive role of clinical chemists in starting and offering services such as transition care, medication reconciliation, medication optimisation, and evidence-based drug information and interventions

1. Introduction

Cardiovascular illnesses most commonly manifest as coronary artery disease (CAD). In 2010, it was projected that 47 million individuals in India suffered from CAD. India appears to have the highest global burden of ACS with a very high prevalence of CAD, based on data from the CREATE Registry [1]. Compared to 404,000 deaths in the US, it was projected that 2.3 million deaths in India were caused by CAD. It has been noted that throughout the last forty years, the prevalence of CAD in India has increased by 300% or more, and it is currently rising at a rate of 5 to 6% annually. The number of productive years of life lost to CAD in the Indian population is expected to roughly double by 2030 compared to 2004 [2]. More than 40% of patients with ST-segment elevation MI arrived at the medical facility within 6 hours of the onset of symptoms, according to a recent large ACS registry from southern India. Additionally, the registry showed that only 40% and 46% of patients received the best possible in-hospital and discharge medical treatment, with rural areas experiencing poorer rates of this than metropolitan areas. There may be a connection between changes in lifestyle and the increased incidence of ACS among Indians. According to multiple case-control studies, dyslipidaemias, smoking, diabetes, hypertension, abdominal obesity, psychosocial stress, poor diet, and physical inactivity are major risk factors for coronary heart disease (CHD) in India. The implementation of appropriate preventative methods as needed will significantly strengthen the effort to battle the epidemic [3]. These risk factors have historically been separated into two groups: non-modifiable risk factors (age, gender, and inherited variables) and modifiable risk factors (smoking, hypertension, raised cholesterol, decreased high density lipoprotein cholesterol, and diabetes). Diabetes [7] has been identified as an independent risk factor linked to higher mortality during hospitalisation and short- and long-term follow-up in patients with ACS, among a variety of modifiable risk factors for developing CAD [11]. It is anticipated that non-communicable disease deaths will rise by 17%. Population-based strategies and the development of cost-effective interventions that are accessible and inexpensive for both those with the disease and those who are at high risk of contracting it may be able to prevent a certain percentage of this illness and mortality [4]. The three main issues with cardiovascular disease (CVD), which accounts for over 125,000 avoidable deaths annually, are medication errors, drug-related problems (DRPs), and medication non-adherence [5]. This is somewhat explained by the fact that about half of CVD patients regularly take prescribed life-saving medications. Clinical pharmacy services and actions are delivered to minimise the inherent risks associated with the use of medicines, increase patient safety at all steps in the pharmacotherapy management pathway, and optimise health outcomes for patients. It was previously thought that multipurpose health workers, such as clinical pharmacists, could perform the activities to prevent the "burden." In addition to being actively involved in therapeutic practices,

clinical chemists significantly support these activities by organising modifiable risk variables and optimising medication. Because CVDs typically coexist with conditions that lead to polypharmacy and comorbidities, they are more susceptible to drug-related problems (DRPs).

2. Literature Review

A multidisciplinary collaborative team care service model focused on service design was created in [6] to address drug-related issues. The foundation of their service model was a 4D framework. The service was dubbed DrugTEAM (Drug Therapy Evaluation and Management) and was described as a Patient-oriented, Collaborative, Advanced, Renovated, and Excellent (P-CARE) service. Their research showed how to apply a service design framework to create a collaborative MTC service model that manages the unmet requirements of both patients and healthcare practitioners. By putting their service model into practice, they want to improve patient outcomes by fortifying the professional bond between chemists and stakeholders. A method for comparing clinical pharmacy services that have been shown to improve patient care quality was created in [12]. The instrument will incorporate quality indicators and contextual elements. Subsequently, a Delphi poll was carried out and the tool's usability and content validation were tested in a real-world setting. Finding the contextual elements and quality indicators that the tool needs to incorporate is their primary outcome measure [8]. Ten quality indicators and 36 pertinent contextual factors were chosen, and these indicators represented six clinical pharmacy activities that had been shown to improve patient outcomes: medication reconciliation at admission, patient monitoring, information sharing with the health care team, patient education, discharge and transfer medication counselling, and adverse drug reaction monitoring. As a result, three Delphi rounds were necessary (rounds 1-2: 9 participants, round 3: 8 participants). Their kit included an instruction manual and three data collecting instruments to gather the information required to create the quality indicators and to benchmark. As a result, they developed and validated a benchmarking tool that is designed to identify and promote clinical pharmacy activities which demonstrated to improve patient outcomes [9].

3. Methodology

The study was carried out in the cardiology department of the JSS facility in Mysuru, which has 1800 beds and serves patients from Mysuru and the surrounding areas. The facility is a multispecialty teaching hospital with 36 specialities. The cardiology department has 100 beds, a state-of-the-art non-invasive cardiac lab, an invasive catheter lab, and a central monitoring facility for critical and emergency care needs. A monthly average of 1500 patients visit the department, which also offers outpatient treatments and speciality clinics (heart failure, paediatric cardiology, and anticoagulation). From patients' previous and current clinical records, as well as from interviews with patients, their carers, and medical professionals, all pertinent and necessary information was gathered. This information was obtained through case notes (ED notes, physician progress notes, procedure notes, nursing flow sheets, and multi-disciplinary progress notes), treatment charts, laboratory and diagnostic investigation reports, discharge summaries, and treatment charts. A properly created data collecting form was used to record all of the data that were gathered [10].

4. Results and discussion

MS Office Excel 2019 was used to enter all of the gathered data. The presentation of continuous variables was given as mean ± standard deviation (SD). The presentation of categorical variables included percentages and absolute values. The groups were compared using the chisquare test, t-test, or Wilcoxon sign test. The independent variables included the presence of prescription drugs and polypharmacy, the number of comorbidities, the length of hospital stay, age, gender, occupation, economic status, educational status, marital status, location, smoking, and alcohol consumption, while the dependent variables included drug-related problems, hospital readmissions, and mortality. To preserve group resemblance and compare variables between groups (MTC & UC) at various intervals, Friedman's test was employed.

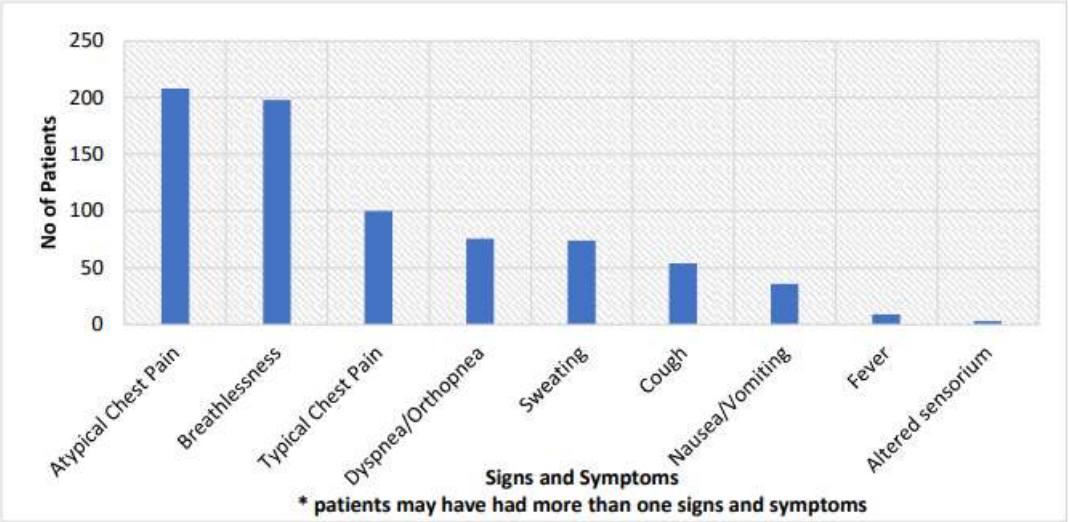

Figure-1: Reasons for Admission

To investigate the relationship between the variables, a univariate analysis and a multivariate analysis were carried out. To find the determinants of drug-related issues, a multivariable logistic model contained a p-value < 0.05 from the univariate analysis. An 8-item validated survey with two domains is conducted during the follow-up. The Goodman and Kruskal's gamma test was used to evaluate the association between responses and socio-demographic characteristics, while the sign test was used to compare people. Every test had two tails, and a two-tailed p-value of less than 0.05 was deemed statistically significant. The clinical impact was measured by looking for instances of type 2 myocardial infarction, reducing mortality and life-threatening conditions, increasing the likelihood of readmission, extending hospital stays, preventing illness and treatment failure, and improving medication adherence. Using the cost-effective analysis approach, the economic impact was evaluated, and the incremental cost-effectiveness ratio was illustrated by comparing the study groups' respective readmission-related expenses and outcomes.

There were 432 patients participating in the study during the Phase, with males making up the majority of the population (males, N = 294 (68.05%) versus females, N = 138 (31.95%)). In the age range of 41 to 60, there were more patients [201 (46.5%)]. There were patients with alcohol use disorders (39; 9.02%), smokers (48; 11.11%), and obese people (16; 3.7%). Atypical chest pain was the most frequently reported symptom among 432 patients with ACS (208; 48.14%), followed by dyspnoea (198; 45.83%). Additionally, usual symptoms were coughing [54 (12.5%), sweating [74 (17.12%), dyspnea/orthodontia [76 (17.59%)], nausea/vomiting [36 (8.33%)], and chest discomfort [100 (23.14%). Merely a small number of patients [9 (2.08%)] and 3 (0.69%)] have altered sensorium. Fig-1 Of the 432 patients admitted, majority of the patients had NSTEMI-ACS [225 (52%)] followed by STEMI-ACS [147 (34%)] and Unstable Angina [60 (14%)].

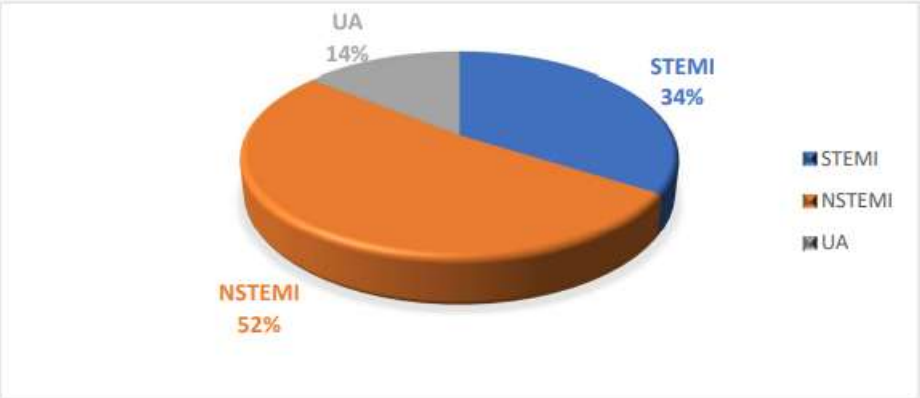

Figure-2: Diagnosis

The two most prevalent co-morbid conditions in our sample were type 2 diabetes mellitus [211 (48.84)] and hypertension [220 (50.92%)]. The majority of patients [139 (32.17%)] had Type 2 diabetes mellitus and hypertension, followed by COPD [23 (5.3%)], renal 0 50 100 150 200 250 * Patients may have experienced more than one of the following signs and symptoms. STEMI 34 percentNSTEMI 52%, UA 14% Hypothyroidism [18 (4%)], liver disease [5 (1.5%)], and STEMI NSTEMI UA 75 disease [22 (5%)]. Depression (6 (1.6%), cellulitis (3 (0.69%)], dyslipidaemia (3 (0.69%)], asthma (4 (0.92%)], bronchitis (2 (0.46%)], NSAID usage (1 (0.2%)), seizures (2 (0.46%)], and pancreatitis (1 (0.2%) were among the few conditions that affected the patients.

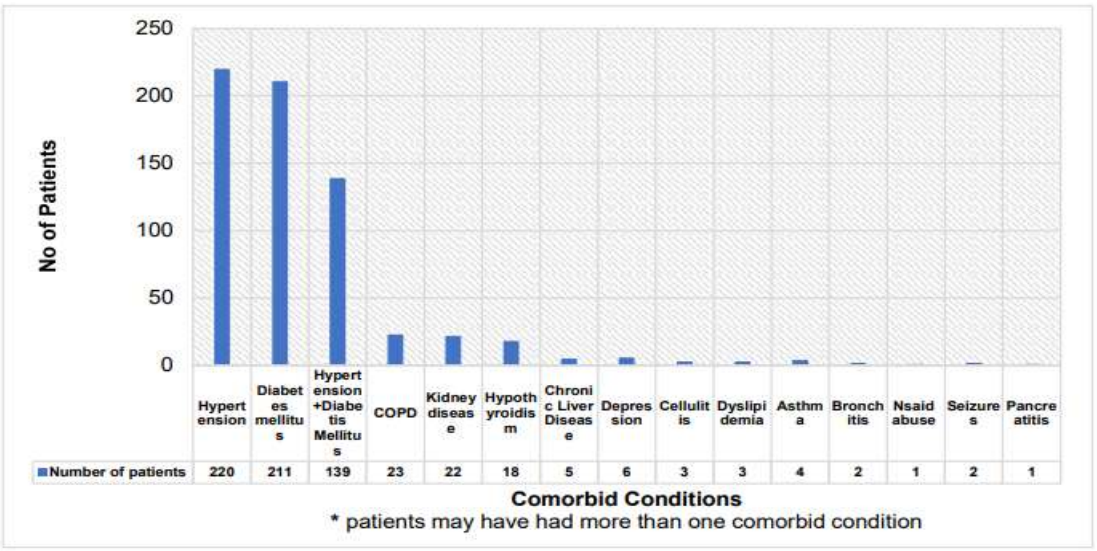

Figure-3: Number of patients with Comorbid Conditions

Prescriber level interventions (122, 33.24%), medication level interventions (168, 45.77%), and patient level interventions (77, 20.98%) accounted for the majority of interventions out of 367 DRPs. Out of all the interventions submitted, 285 were approved and 82 were neither modified nor approved. Alderman's classification was used to evaluate the therapies, and 166 (58.32%) of them were found to be interventions of moderate relevance. (Figure 4)

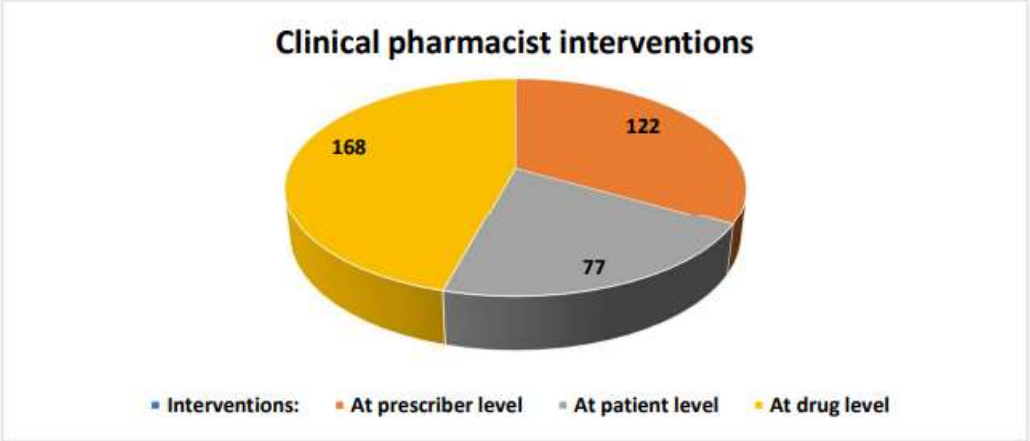

Figure-4: Clinical Pharmacist Interventions

We used a double diamond service design model and a variety of service design tools in our study to show how to optimise CAD care pharmacotherapy using an Evidence-Based Clinical Pharmacy Service Framework. Our research's specific goal is to investigate the stakeholders' unfulfilled, unidentified requirements and expectations and provide evidence-based plans of action to meet those needs. Our study's methodology, which included service design modelling, illustrated the stakeholders' unmet demands from the available services and created and implemented a workable service framework. According to observations made at the study location, co-service providers desired that the clinical chemist offer patient-specific, tailored treatments to reduce the likelihood of drug-related issues and improve the patient's adherence to prescription regimens. The author of a different study indicated that co-providers of the service wish to build cooperative professional connections and suggested that clinical chemists play a significant role in preventing and minimising drug-related issues.

5. Conclusion and future scope

In order to optimise pharmacotherapy and the patient care process, we designed and implemented a comprehensive clinical pharmacy service for the management of acute coronary artery disease (CAD). We also prototyped the service activities under four core themes. Our research showed that the proactive involvement of a clinical pharmacist in the implementation of Pharmacotherapy Optimisation, Pharmacotherapy Reconciliation, Evidence-based drug information & interventions, and Transition care services within a survey framework led to the best possible clinical and financial outcomes as well as the secondary prevention of coronary artery disease (CAD). The prevalence of drug-related issues was high among patients receiving treatment for Acute Coronary Syndrome because of the polypharmacy associated with various comorbidities. Multimorbidity, prolonged hospital stays, and polypharmacy were the risk variables linked to DRPs. Working together, physicians and clinical chemists can identify DRPs early and mitigate their effects by putting an emphasis on the best possible pharmacotherapeutic therapy.

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