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Drug Related Issues in Cardio Vascular Patients: Implementation and Evaluation

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ABSTRACT: Drug-related problems have a significant impact on the quality of life, mortality, and morbidity of patients. These problems can occur at any stage of the drug administration process, including prescription, transcription, distribution, and administration. To improve patient safety and treatment outcomes, it is essential to investigate the prevalence, forms, patterns, and clinical significance of drug-related issues in patients with cardiovascular conditions. In a prospective interventional study conducted over eight months in the medical and cardiology wards of a tertiary care hospital, the most frequently reported drug-related problems (DRPs) among inpatients were drug interactions, followed by untreated indications, medications without indications, sub-therapeutic dosages, and overdose. Our findings highlight the critical role of clinical pharmacists in the early detection of DRPs and the associated risk factors to prevent, evaluate, and manage adverse effects of medication use in cardiovascular patients. The study also revealed that none of the patients who participated in the survey reported significant problems with their daily activities. The research identified a total of 138 clinical pharmacist interventions, of which 101 were approved, and 37 were refused. Of these interventions, 87 were resolved, while 51 remained unsolved. In conclusion, clinical pharmacy plays a crucial role in detecting DRPs and their associated risk factors in cardiovascular patients to prevent, evaluate, and manage unfavourable drug-related outcomes.

Keywords: Adverse Drug Reaction, Clinical Pharmacist, Drug Related Problems, Drug Interaction.

INTRODUCTION

Deep vein thrombosis, pulmonary embolism, rheumatic heart disease, congenital heart disease, peripheral artery disease, coronary heart disease, and cerebrovascular disease are only a few of the illnesses that fall under the umbrella term of cardiovascular diseases (CVDs). Heart attacks and strokes are two instances of frequent unexpected, serious occurrences that are typically brought on by a blockage that prevents blood flow to the heart or brain (Haranath *et al.*, 2022; Reyes-Soffer *et al*., 2022; Singh *et al.*, 2022). The accumulation of fatty deposits on the inner walls of the blood arteries that supply the heart or brain is the most frequent reason for such obstructions. Blood clots or haemorrhages from a brain blood vessel can also cause strokes (Kasper *et al*., 2021; Townsend *et al.*, 2022).

Heart attacks and strokes account for 85% of fatalities globally, making cardiovascular illnesses the major killer. The majority of these illnesses are seen in poor and middle-income nations (Ahad *et al.*, 2021; Timmis *et al.*, 2022). By addressing behavioural risk factors including smoking, a poor diet, obesity, inactivity, and problematic alcohol use, cardiovascular diseases can be prevented. Early CVD discovery is essential because it enables quick treatment, which may involve counselling and medication (Ahad *et al*., 2021; Visseren *et al.*, 2021).

In January 1999, at the working meeting of the Pharmaceutical Care Network Europe, a classification system was established for medication-related issues, known as DRP (Drug-Related Problems) (Basger *et al.*, 2015). The DRP categorization system is part of a larger toolkit, which also includes training and validation examples, reporting forms, and the classification scheme itself. The system undergoes regular updates and adaptations to ensure its continued effectiveness. While it is compatible with versions after V8 (with some minor changes), it cannot be used with versions before V8 due to significant updates to the system (Abdul *et al*., 2020; Gonze *et al.*, 2016). In experimental examinations of pharmaceutical care outcomes and in studies to ascertain the type, prevalence, and incidence of DRP, the DRP classification system is employed as a process indicator (Joost *et al.*, 2014). The DRP categorization system is designed to aid healthcare practitioners in documenting DRP data during the pharmaceutical care process. While the term "drug" is used throughout the system, other sources may refer to it as "medication". The hierarchical structure of the system differs from previous methods in that it separates the sources of the issues from their effects, even though it is based on similar fieldwork. It is important to note that many refer to the underlying reasons for DRP as "medication

errors". Quality professionals are aware of this distinction (Chau *et al.*, 2016; Shravani *et al*., 2021).

MATERIALS AND METHODS

The study was conducted at the Government General Hospital in Kurnool, and it lasted for eight months. A total of 246 cardiovascular patients who met the inclusion and exclusion criteria were included in the study. The research design used in the study was interventional, prospective, and cross-sectional. The inclusion criteria for the study were as follows: patients with CVD who were willing to participate, aged 18 years or older (both genders), admitted as inpatients (including CVD patients in the ICU and medical wards), prescribed more than one medication, and had a hospital stay of more than five days. On the other hand, outpatients, pregnant or nursing women, children, and patients with insufficient medical information were excluded from the study.

Sources of data and data collection. The data collection process involved reviewing the patient's medical records and conducting interviews with the patient and/or their representatives. The purpose of this was to gather all available information and identify any actual or potential drug-related problems (DRPs) that the patient may have been experiencing (van Mil *et al.*, 2004). It was found that out of 279 patients, 246 patients were eligible for the study after excluding those who did not meet the inclusion criteria. Among the selected patients, 163 were male and 83 were female, as shown in Fig. 1.

Statistical Analysis. A graph pad prism was used to do descriptive statistics and a test for the degree of significance (Chi-square test) (Giannoglou *et al.*, 2006).

RESULTS AND DISCUSSION

Demographic details. There were 83 female patients and 163 male participants in the current research. Men were more likely than females to be admitted as a result of their higher prevalence of comorbid diseases and potential exposure to risk factors such as smoking, drinking, and sedentary lifestyles. Eight groups were created for the age range: 18–20, 21–30, 31–40, 41–50, 51–60, 61–70, and >71. Males are overrepresented in the 61-70 age range, while females are overrepresented in the 51-60 age range, with a preponderance. Men were more likely than females to be admitted as a result of their higher prevalence of comorbid diseases and potential exposure to risk factors such as smoking, drinking, and sedentary lifestyles. Eight groups were created for the age range: 18–20, 21–30, 31–40, 41–50, 51–60, 61–70, and >71. Males are overrepresented in the 61-70 age range, while females are overrepresented in the 51-60 age range, with a preponderance, such observation was also made by Reddy *et al.* (2022).

Patients with an age range of 18 years or older were included in the study. More patients (23.38%) in the age group were aged 61-70, followed by 51-60 members (22.09%), and the least (5.52%) were in the age group 18-20 years. On the other hand, more patients (33.73%) in the age group were aged 51–60, followed by 61–70 members (15.66%), and the least (6.02%) were in the age group 31–40 years (Fig. 1).

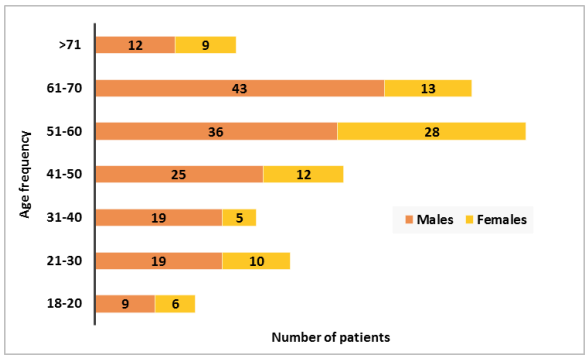

Fig. 1. Age and gender-wise distribution.

Length of hospital stay. It was discovered that 112 (68.7%) of 163 male patients stayed in the hospital for 6-10 days and 51 (31.2%) for more than 10 days. Likewise, among the 83 female patients, 55 (66.2%) stayed in the hospital for 6–10 days and 28 (33.7%) for >10 days (Fig. 2), Dunn *et al.* (2015) also made such observations (Dunn *et al.*, 2015).

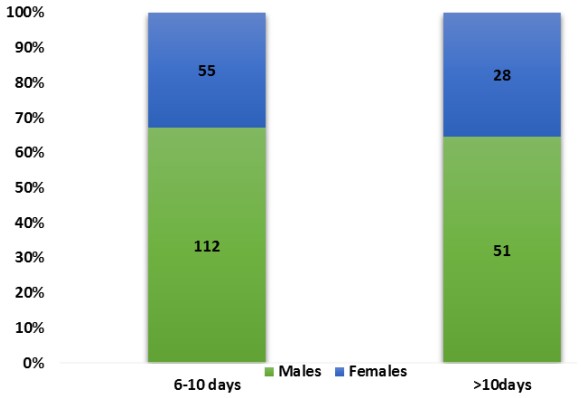

Fig. 2. The length of hospital stays.

Adverse Drug Reactions. 32 cases of recognized ADRs occurred, with the number of male and female cases being equal. In every instance, the intensity was modest to moderate. The most frequent ADRs were strokes, epistaxis, and fever with chills; many ADRs were of unclear cause, and more were recorded (25%), most likely as a result of thrombolytic medications.

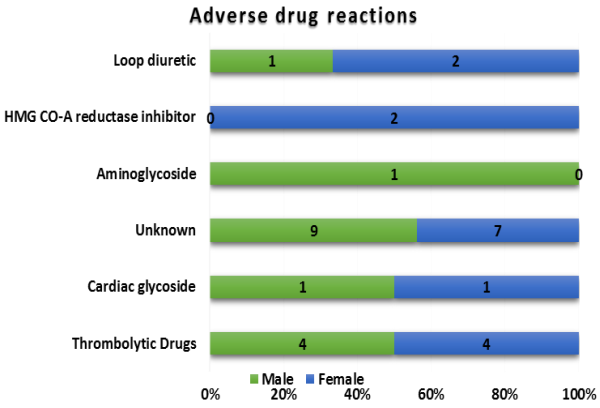

Fig. 3. Adverse drug reactions.

Aminoglycosides are in third place (3.2%), followed by loop diuretics in second place (9.30%) (Fig. 3). Kovačević *et al.* (2019) also made such a study (Kovačević *et al.*, 2019).

Drug-related problems. The prevalence of DRP was highest in patients over the age of 40. A total of 1567 DRPs were identified, the majority of which were drug interactions (1297(82.7%), followed by 137(8.7%) untreated indications, 46(2.9%) drugs prescribed for no indication, 32(2.0%) of ADR'S were observed among those 246 subjects, improper drug selection of 19(1.2%) problems were observed, and a 31(1.9%) patients of medication adherence and 03(0.2%) of subtherapeutic doses and overdose is in the last position with a (Fig. 4). Significant drug-related problems (DRPs) were found among the issues that were evaluated for drug-related issues, including 82.8% drug interactions, 8.8% untreated indications, and 2.58% drug usage without indication. A similar study was performed and reported by Dempsey *et al*. (2017).

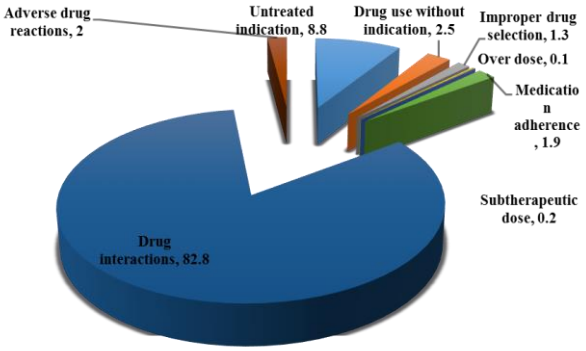

Fig. 4. Drug Related Problems.

Clinical pharmacist interventions. In the present study, 138 clinical pharmacist interventions were suggested; among them, 101 interventions were accepted and 37 were rejected; only 87 problems were solved, and the remaining 51 are not resolved (Fig. 5). Ali *et al*. (2018) also saw such observations in their investigations (Ali *et al.*, 2018).

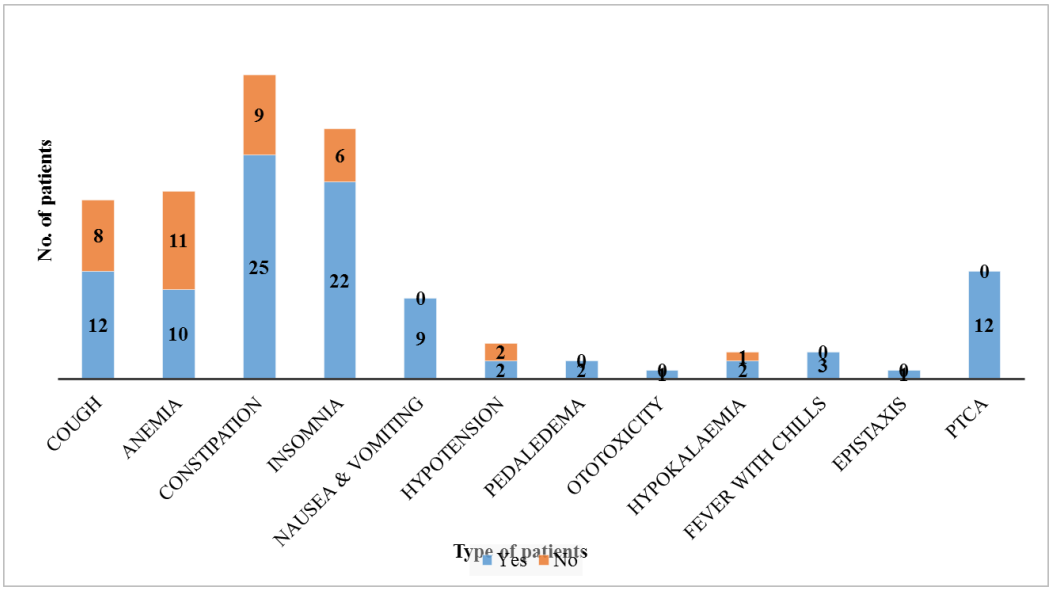

Fig. 5. Clinical pharmacist interventions.

CONCLUSIONS

The study found that patients with cardiovascular diseases are at risk of multiple drug-related problems that can be addressed through clinical pharmacist interventions. The study analyzed the data of 264 inpatients admitted to the cardiovascular department of Government General Hospital, Kurnool, and identified a total of 1567 DRPs. Males were more affected than females. Myocardial infarction was the most commonly observed CVD, and a total of 3001 drugs were prescribed during the study period. The majority of patients stayed in the hospital for 6-10 days and were prescribed 6-10 drugs, including furosemide, metoprolol, aspirin, spironolactone, clopidogrel, atorvastatin, and telmisartan. The most common DRPs identified were drug interactions, with expected drug interactions due to cardiovascular drugs accounting for 82.7% of all interactions. Other DRPs identified were untreated indications, drug use without indication, subtherapeutic dose, and overdose. The study found that all patients had no major issues in their routine daily activities. The study proposed 138 clinical pharmacist interventions, of which 101 were accepted and 37 were rejected. Of these interventions, 87 problems were resolved, while the remaining 51 remained unresolved. The study highlights the crucial role of clinical pharmacists in identifying DRPs and their associated risk factors and in preventing, assessing, and managing undesired outcomes due to the use of drugs in cardiovascular patients.

FUTURE SCOPE

For improved patient monitoring and treatment, such trials might be expanded to additional hospitals.

Conflict of Interests. None.

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