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INFLUENCE OF POLYPHARMACY MANAGEMENT ON CARDIOVASCULAR OUTCOMES IN PTCA PATIENTS WITH LIFESTYLE AWARENESS: A PROSPECTIVE OBSERVATIONAL STUDY COMPARING PATIENTS WITH AND WITHOUT POLYPHARMACY INTERVENTIONS

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ABSTRACT

This prospective observational study evaluated the impact of polypharmacy management and lifestyle awareness on cardiovascular outcomes in patients undergoing percutaneous transluminal coronary angioplasty (PTCA). Conducted over six months in a secondary care hospital, 130 patients with coronary artery disease (CAD) were assessed using clinical data, medication records, and lifestyle modification scores. Interventions included medication review, optimization, dose adjustments, and patient counseling by clinical pharmacists, alongside lifestyle education. The majority of patients were males aged 51–60 years, with high prevalence of comorbidities such as hypertension and diabetes. Statins and dual antiplatelet therapy were the most frequently prescribed drugs. Patients receiving polypharmacy interventions demonstrated improved medication adherence, better awareness, and reduced rehospitalization rates compared to those without interventions. The findings highlight the critical role of structured pharmaceutical care and lifestyle modification in enhancing long-term cardiovascular outcomes and quality of life in post-PTCA patients, emphasizing the need for integrated, patient-centered management strategies.

Keywords: *Polypharmacy management, PTCA, Coronary artery disease, Lifestyle modification, Medication adherence*.

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INTRODUCTION

Percutaneous transluminal coronary angioplasty or percutaneous coronary intervention (PCI) is also known as coronary angioplasty, it is a minimally invasive procedure that uses a balloon to open blocked or narrowed coronary arteries to improve blood flow to the heart muscle (myocardium). The narrowing of arteries either may be due to lipid deposits called atherosclerosis a coronary artery disease (CAD) or platelet aggregation, and to restore arterial blood flow to the heart tissue without open-heart surgery. Non-modifiable risk factors include age, gender, ethnicity, and family history of CAD. Modifiable risk factors include hypertension, hyperlipidaemia, diabetes, obesity, smoking, poor diet, sedentary lifestyle, and stress [1].

The management of CAD involves pharmacological and non-pharmacological interventions, such as lifestyle modifications, revascularization procedures, antiplatelet, anticoagulant, lipid-lowering agents, and antihypertensive drugs [2]. In the management of CAD, patient should have undergone PTCA an invasive procedure to increase the life expectancy along with pharmacological management and life style awareness. Management comprises a spectrum of therapeutic interventions including medications such as antiplatelet agents, statins, beta-blockers, angiotensin-converting enzyme inhibitors (ACEIs) or angiotensin II receptor blockers (ARBs), calcium channel blockers, nitrates and others, as well as lifestyle modifications and an invasive procedure. The main aim is to prevent or to reduce the occurrence of cardiovascular events,

such as myocardial infarction, stroke, and heart failure, and to improve the quality of life of patients with CAD [3,4]. However, medication adherence depends on various factors, such as the availability, accessibility, cost-effectiveness, and health care provider should counsel the patients regarding medication and side effects of the drugs prescribed and also about the importance of medication adherence, benefits and risks of the treatments given [5].

Therefore, this observational study was carried out to assess the influence of polypharmacy management on cardiovascular outcomes in PTCA patients with lifestyle awareness by the health care provider during the hospital stay and at the time of hospital discharge. After surgery, polypharmacy interventions are seen in particular age groups with co-morbidity, fluctuations of pharmacological actions, dose and dosage adjustments are done by the clinical pharmacist in post-PTCA, interventions are implemented by medication review, medication optimization and switching of medications [6,7]. As for non-pharmacological intervention lifestyle awareness should be provided by the hospital nutritionist with the help of clinical pharmacist to improve the long-term cardiovascular outcomes. Observational studies can provide valuable information on the influence of polypharmacy management on cardiovascular outcomes, effectiveness, safety, and cost-effectiveness of treatments in routine clinical practice, and can complement the evidence from randomized controlled trials, which may have limited generalizability due to strict inclusion and exclusion criteria, short follow-up duration, and controlled settings [8].

Observational studies can also help to evaluate the adherence and persistence of patients to the prescribed medications, and the factors that influence them, such as patient characteristics, drug characteristics, social and economic factors. Moreover, observational studies can assess the awareness and knowledge of patients and healthcare providers about the medications used in CAD, and the impact of educational interventions on improving the awareness and long-term outcomes [9, 10].

In this study, an observational study was conducted on the assessment of influence of polypharmacy management on long term cardiovascular outcomes with and without interventions and using data from a secondary care hospital in India. Patients with a confirmed diagnosis of ACS or CCS were included and collected data on their demographic, clinical, and medication characteristics, as well as their cardiovascular outcomes, and life style awareness levels. Descriptive and inferential statistics were used to analyze the data and to compare the results with the current guidelines and evidence.

METHODOLOGY

Study Design

Influence of polypharmacy management on PTCA patients on cardiovascular outcomes with life style awareness: A Prospective observational study comparing patients with and without polypharmacy interventions.

Study Site

The study was conducted at Sankalpa super speciality hospital, Tirupathi

Study setting

The subjects were recruited from the Patient in the Department of Cardiology.

Study Period

The study was conducted for a period of 6 months from November 2024 to May 2025.

Sample Size

120 subjects, who met the inclusion criteria, were enrolled in the study.

Eligibility criteria

Inclusion criteria

1. Patients diagnosed with CAD with PTCA.
2. Availability of complete medical records.
3. Patients of age above 18 years and below 80 years.
4. Patients who have undergone previous invasive procedures and are under medication therapy.

Exclusion criteria

1. Patients who are not willing to give informed consent.
2. Patients who are newly diagnosed with CAD.
3. Non-CVD diagnosis.
4. Pregnant and lactating women.

Ethics

This Trial has been approved by all the Ethics Committee members without any conflict of interest and got ethical clearance from RVS Institutional Ethics Committee (IEC), with Ethics Clearance Number IEC/RVSHRF/2024/08.

Ethical issues

- There is no ethical issue in our study as there is no involvement of invasive procedures.
- We are going to strictly adhere to the ethical principles and get informed consent from the participants.
- There is no potential risk involved as it is an observational study.

Study procedure

- The participants were recruited for this study from the Intensive Coronary Care Unit (ICCU) and General Cardiac OPD; based on inclusion and exclusion criteria.
- Once the patient understands and signs the Informed consent form (ICF).
- Collection of data from patients in the Case Report Form (CRF).
- Finally, the filled questionnaires are interpreted for results.

Materials used

a) CRF: For Patient data collection.
b) Lifestyle modification Questionnaires – For implementation of life-style awareness on their patient counseling.

c) MS Excel- for Data Entry and interpretation of results.

Data Collection

a. A CRF is used to gather information on subjective, objective, assessments and plans of the subject's case.

b. Asking LMS questionnaires involves the data that aids in assessing the Knowledge, regarding disease and medications from patients, there are about 5 questions.

Statistical analysis

By the Protocol, a sample size of n = 120 was achieved by recruiting participants within the study period [November 2024 to May 2025]. The tools used for analysis Microsoft Excel 2021. Statistical analysis has been performed for both Categorical and numerical variables. To attain the Baseline details, the nominal data has been categorized and has been represented by its occurrence and percentages; bar Figures and pie charts have been used wherever necessary for Figural Representation.

RESULTS & DISCUSSION

The study results are obtained by measuring the awareness of the subject's Knowledge, regarding medications and life style modification score by using questionnaires and identifying the interventions using a prescription chart in the medical records by case report form. Also to enrich knowledge about the disease, and drugs and to improve Quality of Life (QoL) patient counselling was provided. The scores given for each participant were entered in MS Excel. Further statistical analysis was done using MS Excel 2021. The total scores were analysed using MS Excel 2021.

Baseline Characteristic of the study population

Age

The age group of 51-60 years was found to be mostly affected by CAD when compared to other age groups.

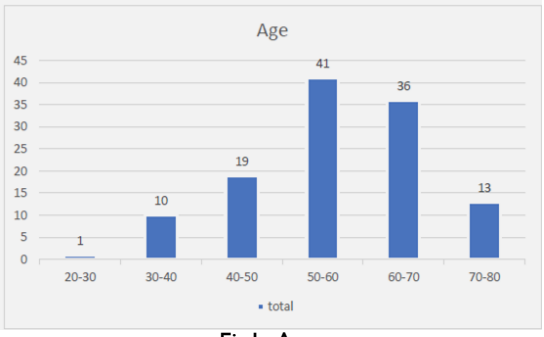

Fig1. Age

Gender

The Males (74%) are more prone to have CAD when compared to females.

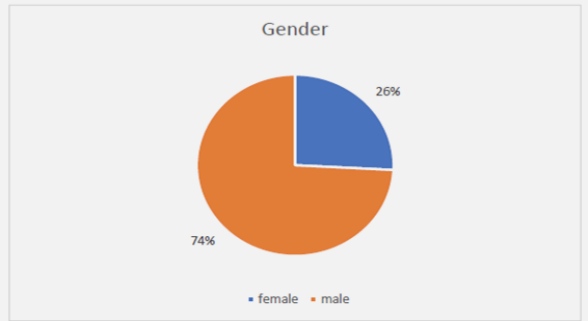

Fig. 2. Gender distribution of CAD

Social Habits

The social habits were observed in that the smokers were (12%), the alcoholics were (21%), non-vegetarians were (71%) and vegetarians were (5%)

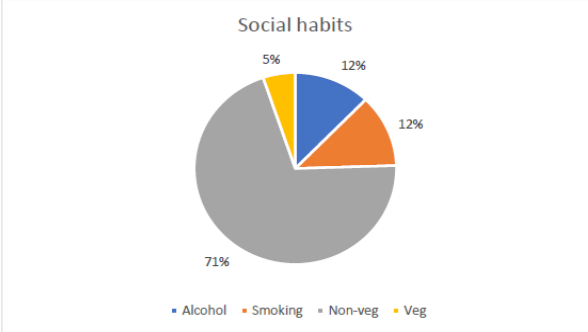

Fig. 3. Social Habits

Life Style Modification Score

The lifestyle modification score 1; (20), score 2; (40), score 3; (20) and score; 5(10).

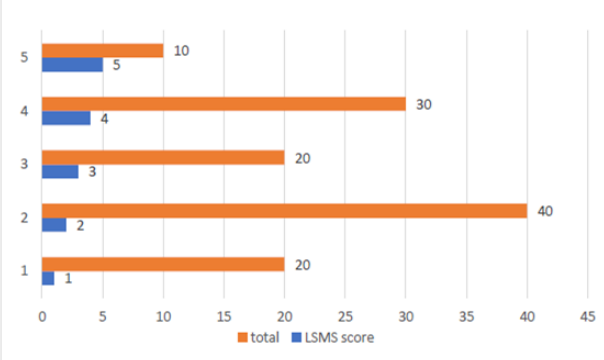

Fig. 4. Life Style Modification Score

Diagnosis

The Subjects who were only diagnosed with CAD are 40%, CAD with DM 36.6%, CAD with HTN 45%, CAD with CKD 3.33%, and CAD with other systems abnormalities 1.6%.

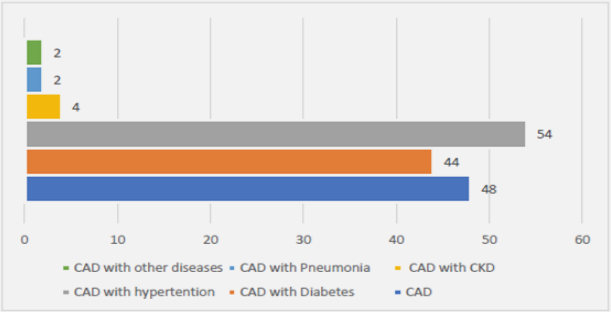

Fig. 5. Diagnosis of the subjects

Sedentary Lifestyle

A sedentary lifestyle refers to a lack of significant physical activity. It is becoming a significant public health issue and relates to a range of chronic health conditions. Here from our study results 21.6% of subjects have a sedentary lifestyle.

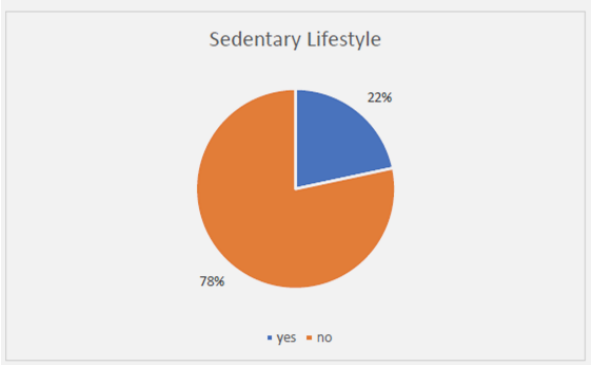

Fig. 6. Sedentary Lifestyle

Medical Management

Frequency of Drugs Prescribed

The treatment was given to a patient as per the disease condition. Dual Anti Platelet drugs are about (96.66%) and it is one the most common drugs prescribed drugs. The Statins (98.6%) and the Anti-HTN's (81.6%) are the next most commonly prescribed drugs.

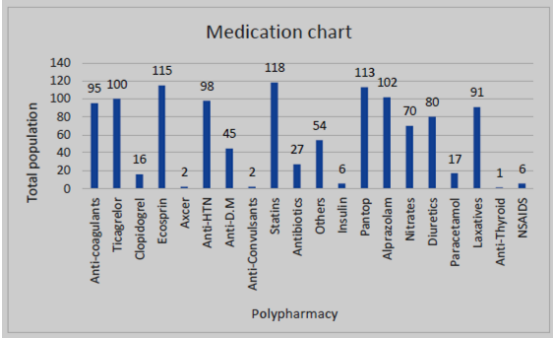

Fig. 7. Medications

Polypharmacy Interventions

Interventions are implemented by managing the polypharmacy by medication reduction (35), medication optimization (30), lifestyle modifications and monitoring (45) and 25% of patients with no interventions.

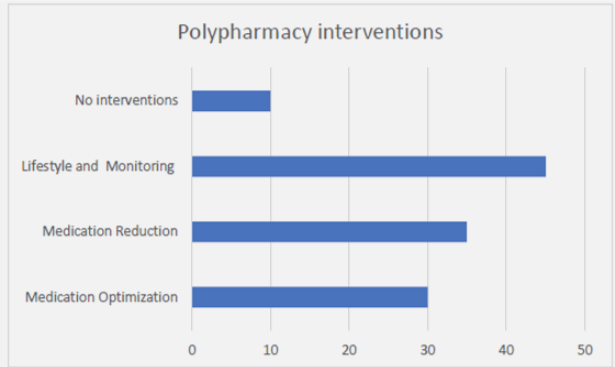

Fig. 8. Polypharmacy interventions

This study aimed to assess the influence of polypharmacy interaction in patient cardiovascular outcomes as well as providing knowledge on lifestyle awareness to reduce the cardiovascular complications. The patients in recent days are health conscious and are heeding to acquire knowledge related to the disease they or their family members suffering from, especially of life-threatening diseases. This needs to be learned and sufficient knowledge of Clinical pharmacists is used in this study to accomplish a positive outcome and better impact on the QOL of the patients and also to enrich themselves with knowledge on drugs and disease with the assessment of LMS.

From the previous study done by Riya Sharma et.al., [2023] on Evaluation of Drug Utilization in Patients with Coronary Artery Disease: Prevalence, Predisposing Factors and Prescribing Patterns in Tertiary Care Hospital in Punjab [12]. The observation of alcohol and tobacco consumption is more prevalent among male CAD patients, while female CAD patients are more likely to be non-smokers and non-drinkers. The population under study is prone to CAD and there is a need for rational drug use and patient education to improve the outcomes of CAD patients. In comparison to this study, it was found that the number of smokers and alcoholic are reduced and patients do have some knowledge of CAD and drugs used prescribed as per guidelines and there were no changes in the drugs after follow ups.

In addition Battu Rakesh [2016] has conducted a study on Assessment of prescribing pattern in coronary artery disease [13]. This study describes the current scenario of prescribing patterns of cardiovascular drugs in patients with coronary artery disease (CAD) in India and have concluded that the discussion of the findings, which compared the prescribing patterns with the standard guidelines and previous studies and identified the gaps and limitations in the current practice. The rational prescription of drugs is to be done to improve the quality of life and prolongation of the lifetime of patients. This study aids in knowing the current prescribing patterns for CAD according to guidelines and assessing their efficacy with the above results.

Among the total participants in the study, 90% of people with more health conscious are taking drugs as per prescription and 10% of people didn't adhere to medications properly due to some reasons and were admitted to the hospital again.

CONCLUSION

CAD is a life-threatening disease, and the influence of polypharmacy plays a major role in the better outcomes of the patient and insights about the causes of the disease and medications is an important thing in the management and prevention of the disease and avoid its further progression. Patients must also be educated that various predisposing factors and not only because of one factor they are being affected.

Medication Adherence should be strictly done to decrease rehospitalization rates. The role of health care professionals and health education in improving secondary prevention awareness and adherence should be followed as per guidelines. The treatment patterns for CAD as per guidelines follow a few classes of drugs like Statins (Cholesterol lowering drugs), Anticoagulants, Nitrates, Beta-blockers, ACE inhibitors, and ARBs, we must ensure the treatment is given according to the condition of the patient, and their severity. We must also encourage patients to stop being sedentary and start any new lifestyle measures like walking or yoga which aids in maintaining QoL. As morbidity and mortality are increasing day by day, compatible patient education programs are recommended as they possess fascinating results towards QoL improvement with patient counselling during hospital discharge. This study allows the heath care professionals to understand patient mentality and also aids knowing the knowledge towards CAD and its drugs influence in getting better cardiovascular outcomes.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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