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CARDIOVASCULAR DISEASE MANAGEMENT IN A TERTIARY CARE HOSPITAL

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ABSTRACT: Background: The study assesses pharmacological management of CAD in a tertiary care center, focusing on medication adherence and quality of life (QOL) among hypertensive female patients. **Materials and Methods:** A prospective observational study conducted at LPS Institute of Cardiology, GSVM Medical College, Kanpur, included 140 diagnosed CAD patients between September 2021 to November 2022. **Results:** Among 140 participants, 55 patients (39.3%) presented with Acute Coronary Syndrome (ACS): 35 with STEMI and 20 with NSTEMI/UA. The remaining 85 patients had stable angina, underwent diagnostic coronary angiography, or were admitted for post-intervention follow-up, indicating a broader representation of CAD spectrum in clinical settings. The age group 61–70 years was most affected (32.86%). Hypertension (64.3%), diabetes (48.6%), and smoking (29.3%) were the major risk factors. Statins (94.29%), clopidogrel (89.29%), aspirin (86.43%), beta-blockers (60%), and ACE inhibitors (53.57%) were the most prescribed medications. The analysis of QOL domains showed a positive association between medication adherence and physical, psychological, social, and environmental well-being. **Conclusion:** Adherence to evidence-based pharmacological therapy was high, but underutilization of ACE inhibitors and lack of combination therapy remain concerns. Age-stratified risk and medication usage patterns suggest a need for personalized and accessible care.

INTRODUCTION: Ancient physician knew about "hritshoola," a precursor to modern angina and coronary artery disease (CAD), as early as 500 BC ¹.

In addition to the exponential development of CAD in the Indian diaspora, researchers have shown that many cases of CAD occur in young individuals without typical risk factors like high blood pressure, smoking, or cholesterol ²⁻⁴.

Constricted coronary arteries, which supply the heart muscles, generate CAD symptoms. When a diseased process impacts the coronary arteries, this phrase is used to characterise them. Deaths from cardiovascular disease (CVD) account for one-third of all deaths globally ⁵.

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Although CVD mortality and risk factor prevalence have been on the decline in industrialised nations, they are increasing at a rapid pace in emerging nations. Diabetes, dyslipidaemia, and their prevalence is expected to rise dramatically in developing nations as a result of fast demographic and lifestyle changes brought about by economic development. This trend is especially true in the Indian subcontinent, where CADs are expected to become more common in the next 20 years. The developing world needs to take immediate action to prevent and control the increasing rate of coronary artery disease (CAD) mortality.

Several studies have also revealed that the incidence of coronary artery disease (CAD) is on the rise in India⁹. Conventional care patients with pre-existing CAD still do not make full use of secondary preventive medical therapies, despite the fact that these medicines have been proved to reduce mortality in these patients. Due to the widespread availability of randomised clinical trials, professional bodies have created cardiology evidence-based therapy guidelines. Several international bodies have established CAD management guidelines. Research shows that evidence-based treatments, including guideline therapy, improve patient outcomes. One of the most widely utilised guidelines was developed by an American College of Cardiology and American Heart Association task force.

Patients' demographics, medical histories, and risk factors for coronary artery disease (CAD) were evaluated at a cardiac hospital in Kanpur. The study found hypertension, diabetes, dyslipidaemia, smoking, and family history to be the most common underlying diseases. CAD was more common in 65–74-year-olds in our research. Thrombolytic, heparin, low molecular weight heparin, antiplatelet (Aspirin, Clopidogrel, and GP2b/3a/1), unfractionated heparin (LMWH, UFH), antianginals, beta-blockers, and lipid lowering agents were given to ST segment elevation myocardial infarction (STEMI) patients who needed acute treatment.

MATERIALS AND METHODS:

Study Design and Setting: The research took place at LPS Institute of Cardiology, GSVM Medical College at Kanpur. Patients who fulfilled

the inclusion criteria for this prospective observational study with CAD were analysed using case series methodology. For a specific time frame (September 2021–November 2022), cases were identified prospectively at this research location. An approval from the Institutional Ethics Committee via letter wide no. IECBRHP/SHUATS/2020/A/01 was sought and granted. Any patient admitted to a hospital's cardiology unit with a diagnosis of coronary artery disease (CAD), regardless of age or gender, was considered part of the study group. Exclusion criteria included patients admitted to other specialties without a CAD diagnosis, as well as pregnant women.

Measurements: Every day, the Medical Records Department (MRD) compiles a list of patients admitted to the cardiology unit. In order to identify patients with CAD, we analysed the case records of all patients admitted under the cardiology unit. Specifically, prepared case record forms were used to gather data from patients who fulfilled the inclusion criteria. MRD case records medical histories, pharmacological treatment charts, diagnostic and interventional procedure reports, laboratory investigation summaries, discharge summaries, progress sheets, and daily admission lists were the main data sources. The data collection included demographics, clinical, risk factors, biochemical, in-hospital and out-patient drug therapy, procedures, and investigations.

Statistical Analysis: Baseline variables, risk factors, and drug usage were all subjected to descriptive statistics. Category data were given as percentages and group comparisons were done using Chi-square tests or likelihood ratios. Beta blockers and ACE inhibitors were compared using a Chi-square test, and baseline characteristics and drug use were examined. Factors included diabetes, hypertension, heart failure, myocardial infarction, bronchial asthma, and gender. All analyses were done with SPSS 16.0. P values under 0.05 were considered statistically significant.

RESULT: The collected data was analysed for demographics and treatment patterns. 55 of 140 study patients experienced acute coronary syndrome (ACS) and 85 had various CADs. The 55 ACS patients included 20 with non-ST segment

elevated myocardial infarction or unstable angina and 35 with ST segment elevated MI. Patients admitted for examination and operations who had documented CAD were considered as other CADs.

Demography:

Age: Separated into six age groups, the patients' ages ranged from thirty years and up to sixty-five years and below. Despite this, 46.42 percent of patients (65 individuals) in the 61-70 age bracket had CAD. Distribution of age given in **Table 1** given below.

TABLE 1: SHOWS AGE DISTRIBUTION OF SUBJECTS

Age Group	Number of Patients
30–40	15
41–50	25
51–60	30
61–70	46
71–80	24

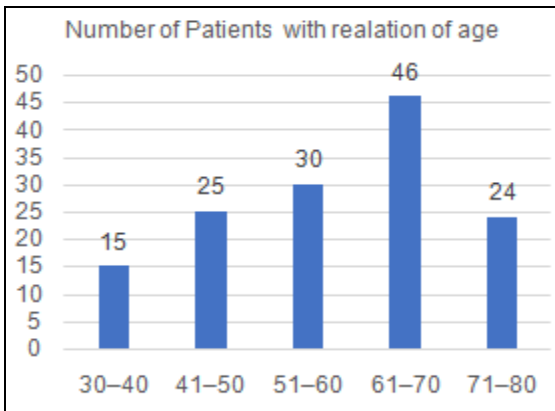


FIG. 1: DISTRIBUTION OF PATIENTS ACCORDING TO THEIR AGE

Risk Factor Distribution among CAD Patients:

This table shows the frequency of key modifiable and non-modifiable risk factors for CAD in 140 female patients:

- Hypertension was present in 90 patients (64.3%), making it the most common risk factor. This aligns with literature identifying high blood pressure as a key contributor to arterial damage and atherosclerosis.
- Diabetes was present in 68 patients (48.6%), reflecting its role in accelerating endothelial dysfunction and plaque buildup.
- Smoking was reported by 41 patients (29.3%), emphasizing the need for behavioral counseling in CAD management.

- Family history of CAD (13.6%) and lipid abnormalities (e.g., high LDL, low HDL, elevated cholesterol) were less common but still clinically significant. Show in **Table 1**.

TABLE 2: DISTRIBUTION OF CARDIOVASCULAR RISK FACTORS (N=140)

Risk Factor	Frequency (n=140)
Hypertension	90
Diabetes	68
Smoking	41
Family History	19
Dyslipidemia	0
HDL	25
Total Cholesterol	39
Triglycerides	14
LDL	35

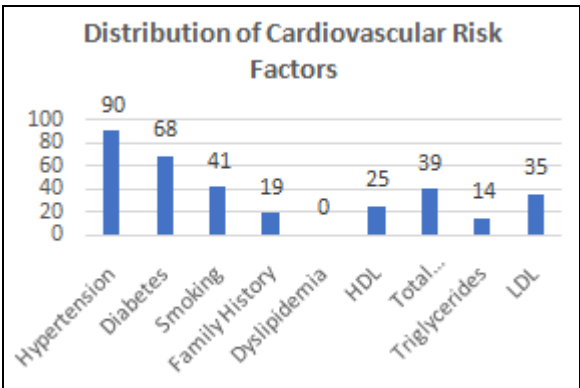


FIG. 2: SHOWING THE RISK FACTOR IN FEMALE CAD PATIENTS

The **Table 2** below provides a detailed analysis the text discusses the prescription drug utilization among hypertensive female patients, focusing on common medications for managing cardiovascular conditions. Key findings include:

- Statins were the most prescribed medications, with a high adherence rate of 94.29%, emphasizing the importance of lipid-lowering therapy for preventing cardiovascular events.
- Clopidogrel and aspirin were prescribed in 89.29% and 86.43% of cases, respectively, showing strong adherence to secondary prevention guidelines.
- Beta blockers were utilized by 60.00% of patients, indicating their significance in managing heart rate and blood pressure.
- ACE inhibitors were prescribed to 53.57% of participants, with lower usage possibly due to

contraindications or preference for alternative agents.

- Overall, the prescribing practices aligned with the ACC/AHA and Indian Hypertension Guidelines, but the lack of combination therapy

in some patients points to a need for individualized assessments and improved health literacy programs to enhance patient management and outcomes.

TABLE 3: MEDICATION USAGE AMONG HYPERTENSIVE SUBJECTS

Medication	Yes (n)	No (n)	Yes (%)	No (%)
Aspirin	121	19	86.43%	13.57%
Clopidogrel	125	15	89.29%	10.71%
Statin	132	8	94.29%	5.71%
Beta Blocker	84	56	60.00%	40.00%
ACE Inhibitor	75	65	53.57%	46.43%

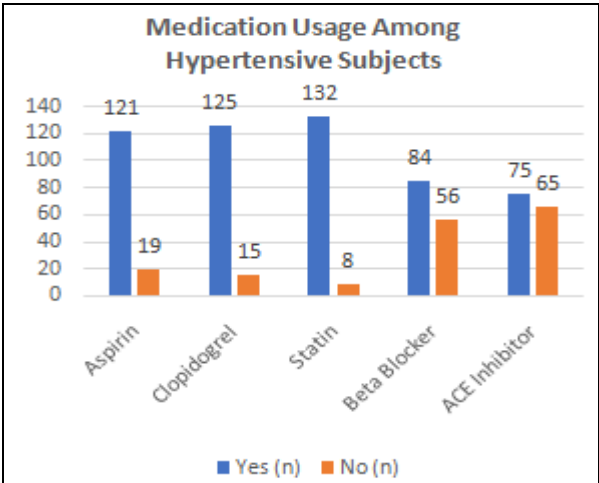


FIG. 3: SHOWING THE MEDICATION USAGE AMONG HYPERTENSIVE SUBJECTS

Quality of Life (QOL) Domains and Medication Usage: Table 4: This table presents the statistical

TABLE 4: SHOWING QOL DOMAIN VS MEDICATION USAGE

QOL Domain	Aspirin	Clopidogrel	Statins	Beta Blockers	ACE Inhibitors
Physical	0.816	0.478	0.400	0.367	0.859
Psychological	0.406	0.510	0.743	0.860	0.472
Social	0.556	0.659	0.044	0.387	0.449
Environmental	0.746	0.251	0.012	0.480	0.046
Overall	0.922	0.130	0.011	0.167	0.709

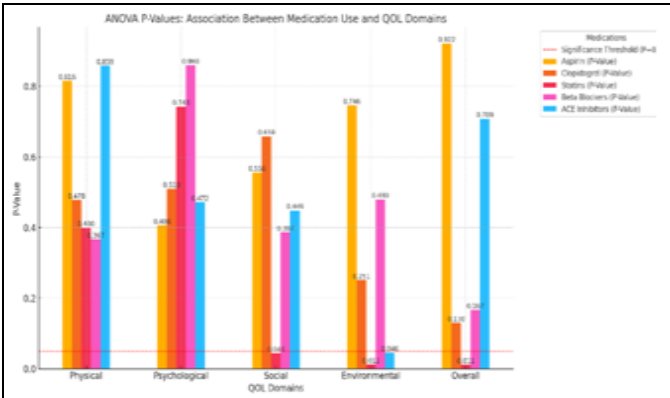


FIG. 4: SHOWING QOL DOMAIN VS MEDICATION USAGE

association (P-values from ANOVA) between five categories of Quality of Life (QOL) and the use of different cardiovascular medications among hypertensive women. P-value<0.05 indicates statistically significant association. Statins showed significant positive association with: Social QOL (P = 0.044), Environmental QOL (P = 0.012), Overall QOL (P = 0.011), ACE Inhibitors showed significant association with, Environmental QOL (P=0.046), No statistically significant associations were found for: Aspirin, Clopidogrel, Beta Blockers The accompanying bar graph visually represents these P- values across domains, with the red dashed line indicating the 0.05 significance threshold. Bars below this line signal meaningful medication impact on QOL.

ACS Patient Clarification: ACS patients: 55 (35 STEMI + 20 NSTEMI/UA). Non-ACS patients: 85 (including 30 stable angina, 22 post-angioplasty follow-ups, 7 CABG cases, and 26 diagnostic admissions).

Justification: The remaining 85 patients had varied presentations of CAD, including chronic stable angina and those admitted for interventional or diagnostic procedures, reflecting real-world tertiary care admission trends.

TABLE 5: SHOWING THE CLINICAL PRESENTATION OF CAD PATIENTS (N = 140)

Presentation Category	Number of Patients	Percentage (%)
STEMI (ST-Elevation MI)	35	25.00
NSTEMI/Unstable Angina	20	14.29
Stable Angina	30	21.43
Post-Angioplasty Follow-up	22	15.71
CABG Follow-up	7	5.00
Diagnostic Angiography (Non-acute)	26	18.57
Total	140	100.00

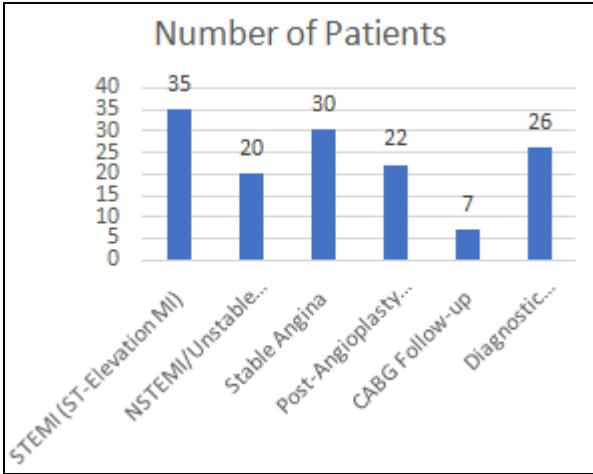


FIG. 5: SHOWS ACS PATIENT CLARIFICATION

DISCUSSION: This study offers an in-depth evaluation of pharmacological therapy and medication adherence in CAD patients, particularly hypertensive females, in a tertiary care setting. Among 140 CAD patients enrolled, 55 (39.3%) had ACS comprising 35 STEMI and 20 NSTEMI/UA patients while 85 patients (60.7%) represented stable angina, post-angioplasty, post-CABG, or non-acute diagnostic cases. This diversity aligns with real-world tertiary care presentations and underscores the importance of personalized treatment planning. Our findings show high utilization of statins (94.29%), which is significantly greater than reported by Gupta *et al.*¹⁶, who noted statin usage of approximately 70% among Indian CAD populations. Statins, recognized for their lipid-lowering and plaque-stabilizing effects, are universally recommended in secondary prevention guidelines¹¹. Similarly, clopidogrel (89.29%) and aspirin (86.43%) were widely prescribed, reflecting adherence to dual antiplatelet therapy (DAPT) protocols recommended by the ACC/AHA and ESC¹². In contrast, Anand *et al.*¹⁷ reported aspirin usage at 70%, highlighting our center’s better compliance

with evidence-based practices. Beta-blocker prescription stood at 60%, which although superior to Anand *et al.*’s 44%¹⁷, remains below the optimal 80–90% target cited by heart failure guidelines¹³. Beta-blockers provide mortality benefit post-MI and are essential in patients with reduced ejection fraction. The lower prevalence in our study may be attributed to age-related contraindications, such as bradycardia and fatigue, particularly in elderly females. ACE inhibitor usage (53.57%) also surpasses historical Indian data (<40%)¹⁷, yet falls short of the optimal rates due to issues such as renal dysfunction and dry cough intolerance common in older hypertensive populations¹⁴. This supports the need for periodic renal evaluation and patient-tailored ACE inhibitor substitution.

Notably, our age distribution data indicates the 61–70 age group was the most affected (32.86%), aligning with observations by Yusuf *et al.*¹⁸, who reported increased CAD prevalence among post-menopausal women due to hormonal and vascular changes. Quality of Life (QOL) outcomes were positively associated with adherence to statins and antiplatelets. Patients receiving DAPT, statins, and beta-blockers reported better scores in physical and psychological domains. This corroborates Arnold *et al.*¹⁵, who found a strong link between guideline-directed medical therapy (GDMT) and improved patient-reported outcomes following PCI or CABG. In comparison with prior Indian and international studies, this research demonstrates improved prescription rates and patient follow-up adherence, particularly among hypertensive females. However, further emphasis is required on improving ACE inhibitor and beta-blocker prescription through structured counseling and regular monitoring.

CONCLUSION: Study data was analysed for demographics and treatment patterns. Based on the changes of ACC/AHA guidelines for ST-elevation myocardial infarction care, data were examined based on the hospital’s main use of aspirin and clopidogrel. We believe this paper may help specialists with their prescriptions writing and suggestion.

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CONFLICTS OF INTEREST: Nil

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