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Original Research Article

Assessment of predisposing factors and prescribing pattern in coronary artery disease patients at a tertiary care hospital of Southern Rajasthan

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ABSTRACT

Background: Coronary artery disease (CAD) is the leading cause of mortality globally. The risk factors for the development of cardiovascular disease include lifestyle changes, diabetes mellitus, hypertension, smoking, hyperlipidemia, obesity and psychosocial stress. Drug regime plays an important role in declining the untimely deaths and enhances the quality of life. Few studies have been done on the prescribing patterns of CAD; hence the main objective of the study was to scrutinize various risk factors and therapy patterns for CAD patients.
Methods: A non-interventional prospective study was conducted among 120 patients, to assess the risk factors and prescribing pattern in CAD patients. Information regarding patients was recorded in data collection form. Data was statistically analyzed using IBM statistical package for the social sciences (SPSS) software.
Results: Majority of the patients were male (77.5%). Most of the patients (59.20%) were in age range of 50-69 years. Most common co-morbidities found were hypertension and diabetes. Body mass index (BMI), tobacco chewing, smoking were major risk factors. Majorly prescribed drugs were antiplatelets, anticoagulants, statins, antibiotics, nitrates, antihypertensive, PPI's and analgesics. Average number of drugs encountered per prescription was 8.70. While number of encounters with a drug indicated in CAD was 5.66. Number of drugs prescribed with an injection and generic name were 4 and 1 respectively. As per DDD calculation, Heparin was consumed in highest amount.
Conclusions: Polypharmacy was practiced. Generic prescribing was low. Major risk factors included BMI, tobacco chewing, smoking, diabetes and hypertension. Findings of this study can be used to develop a framework for ongoing prescription assessment in a healthcare setting.

Keywords: Coronary artery disease, Risk factors, Prescribing pattern, Antiplatelets, Anticoagulants

INTRODUCTION

Coronary artery disease (CAD) is the leading reason of mortality globally.[1] The Global burden of cardiovascular disease is progressively increasing by the years. 85% of all cardiovascular deaths are attributed to heart attack and stroke.[2] It is a pathological process characterized by atherosclerotic plaque accumulation in the epicardial arteries, whether obstructive or non-obstructive, followed by subsequent platelet aggregation and activation clotting cascade in the coronary vessels that supply nutrients and oxygen to the heart.[3] A number of risk factors that are directly responsible for the development and succession of endothelial dysfunction and atherosclerosis including hypertension, age, sex, tobacco consumption, diabetes, obesity, elevated plasma homocysteine concentrations, and dyslipidemias and other co-morbidities.[4] CAD includes the manifestations of coronary heart disease, ischemic heart disease, stable angina, myocardial infarction and acute coronary syndrome (ACS).[5] About 43% of all cardio vascular disease (CVD) deaths are associated with CAD according to the global burden of disease estimates from 2001. While globally the cardiovascular mortality represents about 30% of the total deaths.[6] In 2012 CVD led to 17.5 million deaths worldwide

while in India, studies have reported increasing CHD prevalence over the last 60 years, from 1% to 9% -10% in urban populations and <1% to 4-6% in rural populations.[7] The coronary heart disease has been majorly classified into 3 categories: obstructive coronary disease, non-obstructive disease and micro vascular disease. The obstructive and non-obstructive form affects the large arteries of the heart while the micro vascular form affects the tiny vessels. The primary cause of ACS in about 90% of the patient is rupture, fissuring or erosion of the atherosclerotic plague which results in the formation of partially occlusive or completely occlusive thrombus or a clot. The thrombogenic contents of the thrombus are then exposed to the blood elements, this in turn aggravate the release of platelet derived vasoactive substances such as ADP and thromboxane A2 (TXA2). They induce the vasoconstriction and platelet activation.[4] The deposition of the platelets makes the appearance of clot white and at the same time the extrinsic coagulation pathway gets triggered which results in the formation of factor IIa (thrombin) that transforms fibrinogen into its active form fibrin. This fibrin will stabilize the clot and catches the erythrocytes; as a result, clot appears white. Ultimately the myocardial infarction results due to dispatching of thrombus and produce ischemia with eventual necrosis.[4]

In CAD, antiplatelet drugs like aspirin, a platelet aggregation inhibitor is used in post MI patient as it is known to decrease the risk factors for the CAD. Use of P2Y12 inhibitors like clopidogrel is also found to be helpful in reducing mortality in post MI patients.[8] Use of clopidogrel is largely successful as DAPT in patients with ACS. But it also has some flaws as well, like delayed onset, interactions with other drugs, variable platelet levels due to genetic polymorphism.[9] Hence aspirin and clopidogrel are concurrently used in the treatment of CAD for a minimum of 6-12 months in patients presenting with stable CAD while near about 12 months in patients with ACS.[10] Also, the use of triple antiplatelet is advised in some patients with ACS. It is on high risk but still used as a treatment for ACS.[11]

Along with aspirin anticoagulant therapy is also used. Drugs such as vitamin K antagonist, oral thrombin inhibitors, unfractionated heparin and low molecular heparin are used. Use of vitamin K along with aspirin is controversial because of narrow therapeutic window and the cases of bleedings have been reported. The use of oral direct thrombin inhibitors with aspirin is seen as an option for that.[12] Hence platelet aggregation inhibitors and anticoagulants are mainstay therapies in thrombosis and embolism.[13]

Drug regime plays an important role in declining the untimely deaths and enhances the quality of life. But on the same side the improper usage of these therapies explicitly in patients experiencing the cardiovascular or chronic disorders could induce adverse effects.[14] Analysing the prescribing pattern of drugs in CAD patients is crucial because rational prescribing of these drugs can delay the risks associated with CAD and stabilize them for a longer period of time. By assessing the prescription and the medication history the risk factors and trends in prescription can be identified easily and this allows us to better assist patients with CAD by offering them relevant patient counselling and can improve their quality of life.[15] Till now only few studies have been done on the prescribing patterns of CAD, hence the main objective of our study is to scrutinize the various risk factors as well as therapy patterns for CAD.

METHODS

An observational, non- interventional, prospective study was conducted among in-patients of cardiology department at Geetanjali Medical College and Hospital of Udaipur district for a period of 6 months from March 2022 to September 2022. Total 120 patients were included in the study diagnosed with coronary artery disease belonging to age ranges from 18 years to 80 years and confirmed their diagnosis with coronary angiography, echocardiography, computed tomography (CT), and magnetic resonance imaging (MRI), carotid doppler or received any one of the examinations. Pregnant women, lactating mothers and patients who are facing any acute illness during the course of study were excluded from the study. Approval from hospital and research institutional ethics committee was taken. Written informed consent form was waived from each participant before the initiation of the study. Assessment of medication prescribing pattern and drug utilization in CAD patients was done using daily defined dose (DDD) and anatomical therapeutic classification (ATC) system. The obtained data were then quantitatively analyzed using World Health Organization (WHO) prescribing indicators: average number of drugs per patient encounter, percentage of encounters with a drug (indicated in CAD), percentage of drug (indicated in CAD) with an injection prescribed, percentage of drug prescribed with generic name, and percentage of drug prescribed from the hospital formulary.

Data collection

Based on the diagnoses and the sort of surgery subjects had undergone during the course of treatment, the individuals were screened. The subject's preferred language was used to deliver and collect the informed consent form. Utilizing inclusion and exclusion criteria, the study's eligibility requirements were verified before subject recruitment.

A pre-designed patient data collection form and medical records were used to collect and record socio-demographic data, medical condition, history, and medication history.

Statistical analysis

The statistical program IBM statistical package for the social sciences (SPSS) was used for all of the analysis (V. 25.0, SPSS Inc., Chicago, Illinois, USA). Demographic characteristics underwent descriptive analysis. Continuous

data were expressed as unadjusted means with standard deviations, whereas categorical variables were expressed as percentages. Before using a statistical test, the data were analyzed for normality. For categorical variables, the Chi-square test was used when appropriate. P value of 0.05 or less was regarded as statistically significant.

RESULTS

The mean age of the total 120 participants enrolled in the study was 61.42±12.01 years**.** Majority of participants belong to age group 50-69 years (59.2%) and a smaller number of patients (12.5%) were between the age group of 30-49 years. Age group wise distribution is shown in (Table 1). Male participants were 77.5% and 22.5% were females. 27.5% participants had senior secondary education while graduates and post graduates were 20.8% and 7.5% respectively; remaining 44.2% either had primary, secondary education or were illiterate. Among 120 participants 67.5% patients were employed while 32.5% of the subjects were unemployed.

Table 1: Age group wise distribution of the participants.

Age distribution (years)	No. of patients (N)	Percentage (%)
30-49	15	12.5
50-69	71	59.2
70-89	34	28.3
Total	120	100

Present study reveals that major risk factors for the CAD were high body mass index (BMI), smoking, tobacco chewing, alcohol consumption, type of cooking oil used, hypertension, type II diabetes mellitus, hypothyroidism, surgical history and family history and were found significant ($p<0.05$). Among 120 participants 44.2% were obese and 26.6% were overweight and maximum proportion of the participants were having history of tobacco chewing (76.7%) followed by hypertension (64.2%), smoking (55%), and type II diabetes mellitus (42.5%). Participants present with family history of cardiovascular disease were 7.5% and had history of hypothyroidism were 6.7%.

Also, 36.7% of the subjects diagnosed with CAD were consuming soyabean refined oil and remaining were consuming mustard, sunflower and peanut oil (25.8%, 23.3%, 14.2%) respectively. Various risk factors associated with CAD are shown in (Table 2) having p value <0.05.

A higher proportion of the drugs prescribed to the CAD patients were antiplatelets, proton pump inhibitors (PPI), statins, anticoagulants, antibiotics, analgesics and nitrates. Different classes of drugs prescribed to the patients is depicted in (Figure 1).

Table 2: Risk factors associated with CAD.

Risk factors	No. of patients (N)	Percentage (%)	P value
BMI			
Underweight	17	14.2	0.002
Healthy	18	15	
Overweight	32	26.6	
Obese	53	44.2	
Smoking			
Yes	66	55	0.001
No	54	45	
Tobacco chewing			
Yes	92	76.7	0.030
No	28	23.3	
Alcoholic history			
Yes	23	19.2	0.012
No	97	80.8	
Type of oil used			
Mustard oil	31	25.8	0.031
Soyabean refined oil	44	36.7	
Sunflower oil	28	23.3	
Peanut oil	17	14.2	
Hypertension			
Yes	77	64.2	0.000
No	43	35.8	
T2DM			
Yes	51	42.5	0.002
No	69	57.5	
Hypothyroidism			
Yes	08	6.7	0.000
No	112	93.3	
Surgical history			
Yes	27	22.5	0.031
No	93	77.5	
Family history			
Yes	09	7.5	0.004
No	111	2.5	

Among all the antiplatelets the aspirin- clopidogrel combination was prescribed in highest no (Figure 2). Atorvastatin was the majorly prescribed statin followed by rosuvastatin. Heparin was prescribed in about 101 patients while levofloxacin (25%), cefotaxime (16.7%), meropenem (11.7%), ceftriaxone (7.5%), minocycline (5%), feropenem (4.2%), linezolid (1.7%) were commonly recommended antibiotics. Nitroglycerin (40.8%), isosorbide dinitrate (18.3%), nicorandil (33.3%) and ranolazine (30.8%) were commonly prescribed anti-anginals. Antihypertensives prescription included β-blockers such as metoprolol succinate and propranolol, Angiotensin receptor blocker (ARB's) – telmisartan and

valsartan, angiotensin converting enzyme (ACE) inhibitors- ramipril, calcium channel blockers-amlodipine and diuretics. Other miscellaneous drugs prescribed to the CAD patients included- anti diabetics, antiemetics, bronchodilators and thyroid analogues. The commonly prescribed drugs for both PTCA and CABG patients were aspirin, clopidogrel, heparin, and atorvastatin, but nitroglycerin, nicorandil, and ranolazine were majorly given to coronary artery bypass graft (CABG) patients (Table 3). Majority of patients who were diagnosed with triple vessel disease (TVD) underwent CABG, whereas individuals with single vessel disease (SVD) and double vessel disease (DVD) received percutaneous transluminal coronary angioplasty (PTCA) majorly (Table 4).

Total 120 prescriptions were analyzed and total numbers of drugs prescribed among these subjects were 1045. Hence, the average number of the drugs per patient encountered was found to be 8.70. The number of encounters with a drug indicated in CAD was found 5.66 (Table 5), number of drugs indicated in CAD prescribed with an injection were 4 (Table 6), no. of drugs prescribed with generic name (indicated in CAD) was 1 and number of drugs prescribed through formulary (indicated in CAD) were 15.

On calculating daily defined dose (DDD) of the drugs being prescribed to the CAD patients, atorvastatin was found to be consumed in highest amount with DDD 2568 mg and DDD per 100 bed days 1426.66 (Table 7). A summary of WHO prescribing indicators is represented in (Table 8).

Table 3: Details of different drugs prescribed in CAD patients.

Drugs class and prescribed	Total no. of patients received out of 120	Total no. prescribed in	
		CABG (n=41)	PTCA (n=79)
Antiplatelet			
Aspirin	118	39	79
Clopidogrel	67	25	42
Ticagrelor	31	6	25
Prasugrel	16	4	12
PPI	119	41	78
Statins			
Atorvastatin	85	32	53
Rosuvastatin	28	5	23
Anticoagulant			
Heparin	101	40	61
Anti-hypertensives			
Metoprolol succinate	33	9	24
Propranolol	14	12	2
Telmisartan	4	3	1
Amlodipine	3	3	0
Ramipril	3	2	1
Valsartan	2	2	0
Nitrates			
Nitro-glycerine	49	36	13
Isosorbide dinitrate	22	15	7
Diuretics			
Spironolactone	6	3	3
Torsemide	15	6	9
Furosemide	6	2	4
Potassium channel activator			
Nicorandil	40	36	1
Anti-anginals			
Ranolazine	37	36	1
Anti-diabetics			
H. Actrapid	9	5	4
Insulin glargine	8	3	5
Metformin	16	10	6
Depaglilfozine	2	2	0
Antibiotics			
Feropenem	5	4	1

Continued.

Drugs class and prescribed	Total no. of patients received out of 120	Total no. prescribed in	
		CABG (n=41)	PTCA (n=79)
Meropenem	14	8	6
Cefotaxime	20	18	2
Minocycline	6	6	0
Levofloxacin	30	30	0
Ceftriaxone	9	8	1
Linezolid	2	2	0
Antiemetics			
Ondansetron	33	31	2
Opoid analgesics			
Tramadol	40	40	0
GABA analogues			
Gabapentin	1	1	0
NSAIDS			
Paracetamol	49	39	10
Antidysrhythmics			
Amiodarone	4	4	0
Digoxin	1	1	0
Bronchodilators			
Doxofylline	1	1	0
Thyroid analogues			
Thyroxine	6	4	2

Table 4: Illustration of types of surgeries performed in different types of vessel disease.

Surgery	Diagnosis- CAD			Total
	Single vessel disease (SVD)	Double vessel disease (DVD)	Triple vessel disease (TVD)	
PTCA	27	28	24	79
CABG	0	1	40	41
Total	27	29	64	120

Table 5: Details of prescription.

Variables	Frequency
Total no. of prescriptions evaluated	120
Total no. of drugs prescribed	1045
Average no. of drugs per patient encounter	8.70
Total no. of drugs prescribed that are indicated in CAD	680
Number of encounters with a drug indicated in CAD	5.66

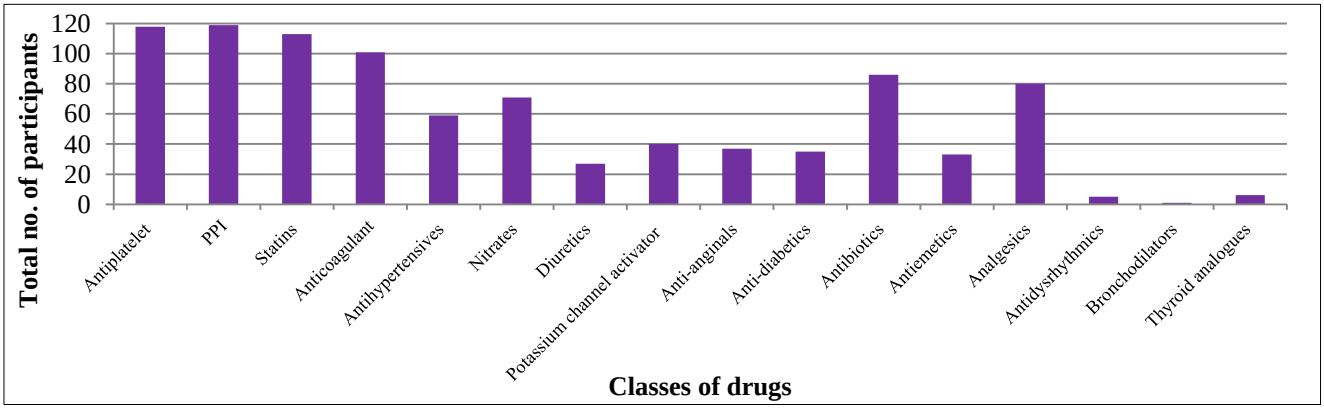

Figure 1: Different classes of drugs prescribed to the participants.

Table 6: Percentage of drugs prescribed with an injection.

Drugs	Total no. of drugs received	No. of drug prescribed with injection	Percentage of drug prescribed with an injection
PPI	119	34	28.57
Heparin	101	101	100
Torsemide	15	10	66.66
Furosemide	6	3	50

Table 7: Calculation of daily defined dose (DDD) and DDD per 100 bed days.

Name of the drug	ATC code	WHO DDD	Route	Net dose in mg	DDD (mg)	DDD per 100 bed days
Aspirin	B01AC06	150 mg	Oral	180675	1204.5	669.17
Clopidogrel	B01AC04	75 mg	Oral	111873	1491.64	828.68
Ticagrelor	B01AC24	180 mg	Oral	28260	157	87.22
Prasugrel	B01AC22	10 mg	Oral	1430	143	79.44
PPI (pantoprazole)	A02BC02	40 mg	Oral, parenteral	80060	2001.5	1111.9
Atorvastatin	C10AA05	20 mg	Oral	51360	2568	1426.66
Rosuvastatin	C10AA07	10 mg	Oral	6140	614	341.11
Heparin	B01AB01	10,000 U	Parenteral	3418000 U	341.8 U	189.88 U
Metoprolol succinate	C07AB02	150 mg	Oral	3987.5	26.58	14.76
Propranolol	C07AA05	160 mg	Oral	10475	65.47	36.37
Telmisartan	C09CA07	40 mg	Oral	1760	44	24.44
Valsartan	C09CA03	80 mg	Oral	200	2.5	1.38
Amlodipine	C08CA01	5 mg	Oral	20	4	2.22
Ramipril	C09AA05	2.5 mg	Oral	30	12	6.66
Nitroglycerine	C01DA02	2.5 mg	Sublingual	5240	2096	1164.44
Isosorbide dinitrate	C01DA08	60 mg	Oral	1875	31.25	17.36
Spironolactone	C03DA01	75 mg	Oral	990	13.2	7.33
Torasemide	C03CA04	15 mg	Oral	3890	259.33	144.07
Furosemide	C03CA01	40 mg	Oral	330	8.25	4.58
Nicorandil	C01DX16	40 mg	Oral	9670	241.75	134.30
Ranolazine	C01EB18	1500 mg	Oral	928000	618.66	343.7
H. Actrapid	A10AB01	40 U	Parenteral	1308	32.7 U	18.16
Insulin Glargine	A10AE04	40 U	Parenteral	2605	65.13 U	36.18
Metformin	A10BA02	2000 mg	Oral	73500	36.75	20.41
Dapagliflozin	A10BK01	10 mg	Oral	250	25	13.88
Faropenem	J01DI03	750 mg	Oral	12000	16	8.88
Meropenem	J01DH02	3000 mg	Parenteral	183000	61	33.88
Cefotaxime	J01DD01	4000 mg	Parenteral	639000	159.75	88.75
Minocycline	J01AA08	200 mg	Oral	8800	44	24.44
Levofloxacin	J01MA12	500 mg	Oral	119500	239	132.77
Ceftriaxone	J01DD04	2000 mg	Parenteral	39000	19.5	10.83
Linezolid	J01XX08	1200 mg	Parenteral	18000	15	8.33
Ondansetron	A04AA01	16 mg	Oral, parenteral	5344	334	185.55
Tramadol	N02AX02	300 mg	Oral, parenteral	81450	271.5	150.83
Gabapentin	N03AX12	1800 mg	Oral	4000	2.22	1.23
Paracetamol	N02BE01	3000 mg	Oral, parenteral	1444000	481.33	267.40
Amiodarone	C01BD01	200 mg	Oral, parenteral	22000	110	61.11
Digoxin	C01AA05	0.25 mg	Oral, parenteral	1	4	2.22
Doxofylline	R03DA11	800 mg	Oral, parenteral	2400	3	1.66
Thyroxine	H03AA01	0.15 mg	Oral, parenteral	4.0	26.66	14.81

Table 8: Summary of WHO prescribing indicators.

Prescribing indicators	N
Total no. of prescribed drugs	1045
Average no. of drugs per patient encounter	8.70
Number of encounters with a drug (indicated in CAD)	5.66
Number of drugs prescribed with an injection (indicated in CAD)	4
No. of drugs prescribed with generic name (indicated in CAD)	1
No. of drugs prescribed through formulary (indicated in CAD)	15

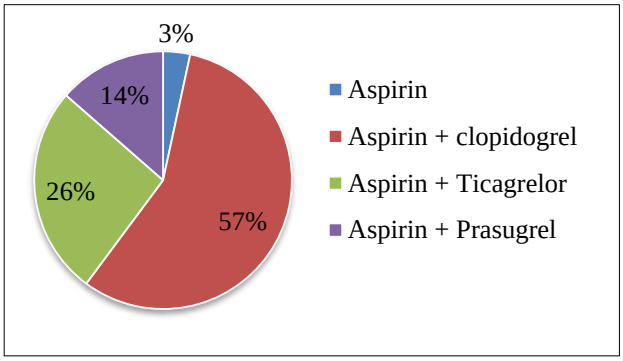

Figure 2: Commonly prescribed anti-platelets and their combinations.

DISCUSSION

It has been established that CAD is main cause of death in both developed and developing nations. Risk factors for the development of cardiovascular disease include lifestyle changes, environmental exposures, and genetics.[16] Age, gender, income level, and other factors all affect the incidence of CAD.[17] The two basic objectives of CAD management are to lessen symptoms and ischemia as well as to avoid MI and death. For CAD, CABG and PCI are two well-established revascularization techniques. It has been demonstrated that multivessel disease patients who undergo CABG require less revascularization than those who undergo PCI.[18] Patients with CAD are frequently on lifetime supportive, therapeutic, and medication for co-morbidities. For patients with CAD, medication development has recently advanced.[19] Ranolazine, nitrates, beta-blockers, calcium antagonists, and antiplatelet medicines are few of the therapeutic medications utilized to treat symptomatic angina related to CAD.[16] The American Heart Association and American College of Cardiology have recommended intravenous infusion of unfractionated heparin and subcutaneous enoxaparin as supplementary therapies for STEMI, NSTEMI, and unstable angina pectoris in the general population.[20]

Studies of prescribing trends might help to pinpoint issues and give guidance to prescribers to raise understanding for the appropriate use of medicines. In order to assure the appropriate use of medications, to lower the morbidity and mortality of the disease and reduce the economic burden, the current study investigated the prescribing patterns of drugs and their rationality in patients diagnosed with CAD.[21]

The present study is compared with the only literatures on this association, namely Solanki et al, Dawalji et al and Belhekar et al.[21-23] 120 patients were included in the current investigation, with 77.5% men and 22.5% women. When categorized age-wise, maximum numbers of patients were from age group of 50-69 years. The results of current study were found consistence with the results of previous studies and indicated that males have higher chances of developing CAD as compared to females and the risk increases with the age. According to the study by Solanki et al, 20.45% of the patients had a history of smoking, and 55.68% of them were obese. While in current analysis, the percentages of patients who had ever smoked or chewed tobacco were 76.7% and 55%, respectively and were considered to be significant risk factors for coronary artery disease. However, the percentage of patients who were obese or pre-obese was 44.2% and 26.6%, respectively. Additionally, present investigation discovered that 44 patients out of 120 respectively, were consuming refined soybean oil, which is commonly known for increasing the levels of insulin, triglycerides and bad LDL cholesterol and lowering the levels of HDL cholesterol. Also the trans fatty acids produced due to consumption of refined oils can be linked to cancer, diabetes and immune system related disorders.[24]

In the current investigation, it was found that patients with CAD also had co-morbidities like -hypertension, type II diabetes mellitus or history of previous cardiovascular surgery, indicating that these conditions must have had a major impact on the development of CAD. More than 90% of the patients had abnormal ECG readings, and these findings were comparable to the results reported by Solanki et al. In addition to the aforementioned conclusions, the current study also identified several surgical procedures carried out in accordance with the patient's diagnosis and the drug regimen used during PTCA and CABG procedures. It was shown that individuals with single and double vessels (100% and 96.55% respectively) received PTCA whereas those with triple vessel disease underwent CABG. The most often prescribed drugs for both PTCA and CABG patients were aspirin, clopidogrel, heparin, and atorvastatin, but nitroglycerin, nicorandil, and ranolazine were only given to CABG patients and metoprolol to PTCA patients. Tramadol and paracetamol were common analgesics prescribed only among CABG patients. Aspirin, clopidogrel, atorvastatin, and heparin were the most frequently prescribed medications in SVD, DVD and TVD patients, while TVD patients were the only group to receive greater prescriptions of nitroglycerin, isosorbide dinitrate, nicorandil, and ranolazine. These results were distinct from those of any of the studies previously mentioned.

All patients with CAD are advised by the WHO to administer aspirin, beta-blockers, statins and ACE inhibitors for secondary prevention.[25] In approximately 90% of prescriptions for the four evidence-based medications for the therapy of CAD, current investigation found that antiplatelet medications and antihyperlipidemic agents were being administered. Additionally; beta blockers were prescribed to 39.2% of patients, ACE inhibitors to 2.5%, and ARBs to 5%. In comparison to the other studies the prescription rate for beta-blockers and ACE inhibitors in this study was comparatively very low. Besides aspirin and clopidogrel combination which were prescribed at a rate of between 90- 99% in the studies listed above, other combinations were also used in current study such as aspirin-ticagrelor and aspirin-prasugrel. In comparison to current findings, studies by Solanki et al and Dawalji et al revealed prescription rates for heparin were 20.45% and 40% respectively, while in our studies the prescription rate of heparin observed was 84.1%.

Other frequently given medications included diuretics and antihypertensives. The usage of antihypertensives in the current study were as follows: calcium channel blockers (2.5%), beta blockers (39.2%), ACEIs (2.5%), and ARBs (5%) while the use of diuretics were as follows: spironolactone (5%), torsemide (12.5%), and furosemide (5%), which was significantly less than in the studies mentioned above. The use of antianginals was reported in present study at 59.16%, whereas in studies by Dawalji et al, Solanki et al, and Belhekar et al, it was shown to be 42.66%, 80.95%, and 70% respectively. Since nitroglycerine and nicorandil were the most frequently prescribed antianginals along with ranolazine, the findings of this study varied slightly from the previous studies. Among the 71.6% of patients who received antibiotics in this study, the majority received levofloxacin, cefotaxime and carbapenems while an earlier study found that penicillin, quinolones, aminoglycosides, and cephalosporins were all used between 65-84%.

The average number of medications per patient in the current study was 8.70, compared to 9.68 and 9.98 in the studies by Dawalji et al, and Solanki et al respectively indicating polypharmacy. Very low number of medications were prescribed under their generic names. Data indicate that 90% of prescribed medications were obtained through formularies, which was not confirmed in any of the studies mentioned above.

The average number of drugs per prescription has not varied substantially between the current and prior research, but the proportion of medications prescribed under their generic names has.

Strengths

The findings of current study provide a new perspective about various risk factors for coronary artery disease as well as the current trends in prescription practices.

Limitations

The limitations of the study are it did not correlate the risk factors and did not determine the clinical status of the patients after the underutilization of drugs. Also, the current study did not determine the ADR's and interactions associated with drug use.

CONCLUSION

The above study reached the conclusion that males are more likely to acquire CAD as compared to females and the major risk factors associated with development of CAD were higher age, tobacco chewing, smoking and co morbidities like hypertension and type–II diabetes mellitus. Most of the CAD patients who were admitted were consuming either refined cooking oils. Patients with coronary artery disease were typically prescribed aspirin, clopidogrel, atorvastatin, heparin, and the antibiotics cefotaxime and levofloxacin. Relating to PTCA and CABG patients most often prescribed medications in both the procedures were atorvastatin, heparin, PPIs, aspirin, and clopidogrel (as dual antiplatelet therapy). Among the type of vessel disease, the TVD had maximum mark and majority of them underwent CABG surgery. Atorvastatin is consumed in the largest amount of any drug when DDD is determined for the medications being prescribed to CAD patients. Assessment of prescribing patterns is a part of clinical review that observes and examines healthcare practitioners as well as provides recommendations for essential changes to ensure logical and economical medical treatment. The current study provides significant and new information regarding the typical pharmacological regimen utilized in CAD patients as well as a number of contributing factors that were prevalent in the majority of the study group and played a significant role in development of CAD. The study produced several significant results that have implications for CAD patients' healthcare. Polypharmacy was practiced. Using brand names instead of generics while prescribing was a common practice. To lower the cost of treatment, practitioners should be encouraged to prescribe medications with generic names.

The findings of this study on the patterns of drug prescription can be used to develop a framework for ongoing prescription assessment in a healthcare setting. By rationalizing prescribing methods, this will also assist physicians in improving patient care and treatment. Also, the present study will make it easier to track the prescription trends at both our hospital and others in the area, as well as their effects on nearby hospitals.

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REFERENCES

1. Khera AV, Kathiresan S. Genetics of coronary artery disease: discovery, biology and clinical translation. Nat Rev Genet. 2017;18(6):331-44.
2. Roy A, Patel NK. Prescribing patterns of cardiovascular drugs in cardiology outpatient department in a tertiary care hospital in Western Odisha. Int J Basic Clin Pharmacol. 2021;10(1):23-8.
3. ESC Guidelines for the management of chronic coronary syndromes. Available at: https://www.escardio.org/Guidelines/Clinical-Practice-Guidelines/Chronic-Coronary-Syndromes. Accessed on 29 December 2024.
4. Dipro JT, Talbert RL, Yee GC, Matzke GR, Wells BG. Pharmacotherapy: a pathophysiologic approach. 7th edition. New York: McGraw-Hill. 2008.
5. Penman I, Ralston SH, Strachan M, Hobson R. Davidson's Principles and Practice of Medicine. 24th Edition. Elsevier. 2022.
6. Ralapanawa U, Sivakanesan R. Epidemiology and the Magnitude of Coronary Artery Disease and Acute Coronary Syndrome: A Narrative Review. J Epidemiol Glob Health. 2021;11(2):169-77.
7. Gupta R. Recent trends in coronary heart disease epidemiology in India. Indian Heart J. 2008;60(2 B):B4-18.
8. Tripathi KD. Essentials of Medical Pharmacology. JP Medical Ltd. 2013.
9. Castini D, Persampieri S, Cazzaniga S, Ferrante G, Centola M, Lucreziotti S, et al. Real-world clopidogrel utilization in acute coronary syndromes: patients selection and outcomes in a single-center experience. Ther Adv Cardiovasc Dis. 2017;11(12):323-31.
10. Lee CW. Dual antiplatelet therapy for coronary artery disease. Circ J. 2015;79(2):255-62.
11. Dzeshka MS, Brown RA, Lip GYH. Patients with atrial fibrillation undergoing percutaneous coronary intervention. Current concepts and concerns: part I. Pol Arch Med Wewn. 2015;125(1–2):73-81.
12. Husted SE, Ziegler BK, Kher A. Long-term anticoagulant therapy in patients with coronary artery disease. Eur Heart J. 2006;27(8):913-9.
13. 13. Lu CH, Fang CW, Chen HM, Fang YP, Fang CT, Huang YB, et al. Prescribing patterns of coronary artery aneurysm in Taiwan. BMC Cardiovasc Disord. 2019;19(1):188.
14. Truong TTA, Phan NK, Vo QV, Diep HG, Vuong HTK, Le TV, et al. Drug-related problems in prescribing for coronary artery diseases in Vietnam: cross-sectional study. Trop Med Int Health. 2019;24(11):1335-40.
15. Mukadam FM, Gawali UP, Chavarkar P, Ali DP, Naghotkar S. Prescription Patterns of Drugs Used in Patients with Coronary Artery Disease at Tertiary Care Hospital. J Pharm Care. 2022;97-102.
16. Malakar AK, Choudhury D, Halder B, Paul P, Uddin A, Chakraborty S. A review on coronary artery disease, its risk factors, and therapeutics. J Cell Physiol. 2019;234(10):16812-23.
17. Shahjehan RD, Sharma S, Bhutta BS. Coronary Artery Disease. In: StatPearls. Treasure Island (FL): StatPearls Publishing. 2025.
18. Cassar A, Holmes DR, Rihal CS, Gersh BJ. Chronic coronary artery disease: diagnosis and management. Mayo Clin Proc. 2009;84(12):1130-46.
19. Kandaswamy E, Zuo L. Recent Advances in Treatment of Coronary Artery Disease: Role of Science and Technology. Int J Mol Sci. 2018;19(2):424.
20. Agrawal H, Aggarwal K, Littrell R, Velagapudi P, Turagam MK, Mittal M, et al. Pharmacological and non pharmacological strategies in the management of coronary artery disease and chronic kidney disease. Curr Cardiol Rev. 2015;11(3):261-9.
21. Solanki ND, Patel N, Desai S, Patel V. Coronary artery disease prescribing pattern and risk factor assessment in the patients undergoing angioplasty. Int J Basic Clin Pharmacol. 2021;10(5):517-22.
22. Dawalji S, Thota S, Venisetty P, Venisetty RK, Raj K, Venisetty. Prescribing Pattern in Coronary Artery Disease: A Prospective Study. Int J Pharm Res Rev. 2014;3:24-33.
23. Belhekar MN, Patel TC, Singh MK, Pandit PR, Bhave KA, Redkar NN. Evaluation of prescribing pattern of drugs use in patients of coronary artery disease at a tertiary care hospital. Int J Basic Clin Pharmacol. 2018;7(9):1792-6.
24. Thangavel VD. Consequences of Human Consumption of Refined Edible Oil, Which is Debatable and Bad for Health. Government Obligation to Offer Appropriate Education Services: Research Analysis. Neurol Neurotherapy Open Access J. 2023;8.
25. World Health Organization. Prevention of cardiovascular disease: guidelines for assessment and management of total cardiovascular risk. Available at: https://www.who.int/publications/i/item/9789241547178. Accessed on 28 November 2024.

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