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Research Article

THERAPEUTIC MANAGEMENT OF CORONARY ARTERY DISEASE USING ANTIPLATELET AND STATINS - A COMBINED RETROSPECTIVE AND PROSPECTIVE STUDY

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ABSTRACT

Purpose: The purpose of our study was to perform a combined analysis of retrospective and prospective study of antiplatelet drugs and statin to evaluate the safety and efficacy of the antiplatelet drugs and statin prescribed in our study. To Understand the mechanism of antiplatelet drugs and statin, to evaluate the use of antiplatelet agents and statin, to find the best antiplatelet drug and statin according to the clinical indications and to formulate future treatment guidelines and protocol. **Method:** 150 cases were collected and the data collection form will be prepared and used. This form mainly contains the demographic details of the patients and medication chart. All information relevant to the study was collected from outpatient as well as inpatient department from the time of admission till the date of discharge after taking consent from patient. **Result:** This is a combination analysis of prospective and retrospective studies for therapeutic management of coronary artery disease 150 cases were collected considering the exclusion and inclusion criteria. The results interpreted from observational study was found to be significant based on Age, gender, comorbidities, Dual anti-platelet therapy prescribed, combination therapies given in both in-patients and out-patients. Statistical analysis showed that, there was a significant improvement in coronary artery disease and decrease in clinical presentations after therapeutic management using antiplatelets and statins

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INTRODUCTION

Ischemic heart disease (IHD), commonly known as coronary artery disease (CAD), is characterised by the heart's arterial supply being weakened (IHD). Thrombosis, atheroma, and coronary artery spasm all impair heart function. This may result in myocardial ischaemia by restricting the supply of oxygenated blood to the cardiac muscle. Cells in the heart muscle may die if this is experienced intensely or over a period of time.

When atherosclerotic plaque develops, it can rupture other vasculature, notably the carotid arteries, and the ensuing cerebral ischaemia are comparable, which is why the term cardiovascular disease (CVD) was selected to encompass CHD, cerebrovascular illness, and peripheral vascular disease. A number of cardiovascular disorders, including coronary artery disease, are rather common. The main blood vessels of the heart are able to supply enough blood, oxygen, and nutrients to

the heart muscle. Inflammation and lipid build-up (plaques) in the heart are generally the causes of coronary artery disease.

Angina and shortness of breath are clinical manifestations of a heart's blood supply being reduced due to coronary artery disease. A sudden restriction of blood flow could cause a myocardial infarction. Usually, coronary artery disease develops over a number of years. Symptoms may not be noticed prior to problems or a myocardial infarction from such a massive obstruction. By leading a heart-healthy lifestyle, coronary artery disease can be avoided. Factors that increase myocardial oxygen demand are typically associated with increased heart rate and workload, and they frequently occur before ischemic episodes (force of contractility). Less frequently, myocardial ischaemia occurs.

It may also occur if the body's need for oxygen rises abnormally, as in cases of thyrotoxicosis or significant ventricular hypertrophy brought on by high blood pressure. The amount of oxygen given to the myocardial is influenced by the coronary artery's luminal cross-sectional size and coronary

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arteriolar tone. Atheromatous plaques reduce the diameter of the coronary artery's lumen, which limits the coronary artery's ability to dilate in response to an increase in myocardial oxygen demand when they are extensive.

Statins: Statins act by the rate-limiting enzyme of the mevalonate pathway, HMG-CoA reductase, is competitively inhibited by statins. Statins will fit into the enzyme's active site and compete with the natural substrate because they are structurally related to HMG-CoA. (HMG-CoA). The pace at which HMG-CoA reductase can create mevalonate, the subsequent molecule in the chain that ultimately results in cholesterol, is decreased because of this rivalry.

Antiplatelets: Antiplatelet drugs prevent platelets from sticking together and decrease your body's ability to form blood clots. These medications are used to treat, and may help prevent, coronary artery disease, heart attack and stroke. Aspirin is the most used antiplatelet drug. In Aspirin Acetylsalicylic acid (ASA) inhibits the formation of prostaglandins. It is inactive against COX-1 and COX-2 enzymes 9,10,11. COX-1 inhibition inhibits platelet aggregation for around 7-10 days

MATERIALS AND METHODS

Location of the study

This is a combined Retrospective and prospective study where patients eligible are enrolled into the study.

The data collection form was prepared and used. This form mainly contains the demographic details of the patients and medication chart. The study was conducted on the Therapeutic management of coronary artery disease using antiplatelets and statins at Tertiary hospital, the duration of the study was 6 months. All information relevant to the study was collected from outpatient as well as inpatient department from the time of admission till the date of discharge after taking consent from patient.

Inclusion Criteria

- Patients Age range 18 -100 years
- Antiplatelets drug and statins therapy as indication for patients with coronary artery disease

Exclusion Criteria

- Patients who are not willing to give consent form
- Patients below age 18 (children and teenagers)

Study procedure

The duration of data was analysed for **CORONARY ARTERY DISEASE** using ANTIPLATELETS DRUGS and STATINS which are enrolled in data collection form which further contains laboratory details emphasizing coronary artery disease. Details of drug and dosage prescribed are entered in medication chart, patient with comorbidities is observed, causes and risk factors if found are enlisted and are controlled by providing patient information leaflets to avoid further complications to patients.

Counselling the patients about the disease is done individually to meet the need for fulfilling the criteria of objective study. After acquiring all these details and collection of all data, results will be interpreted by generating statistical analysis on

the collected data. Final research's results will be concluded and impression will be highlighted.

RESULTS

The combined analysis of both retrospective and prospective study which includes 150 cases. Which was Collected Considering the exclusion and inclusion criteria.

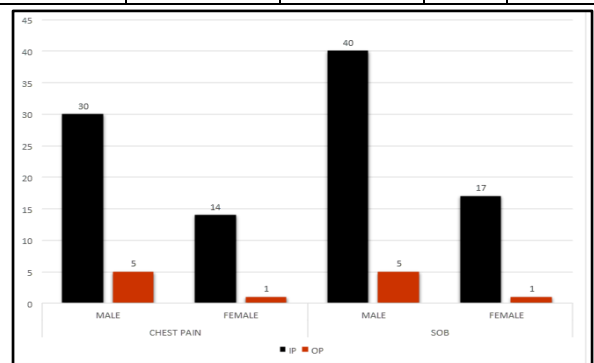
The results were found , out of sample cases the individuals diagnosed with CAD were distributed among male and females, the (95)73% males were found to be in IP department and (16) 80% males were in OP and in case of females in IP department (35) 27% females were found and to OP department (4) 20% males respectively. 20mg was given to 2 patients, dose 2 of 75mg was given to 82 patients, 150mg Ecospirin was given to 26 patients, Ecospirin 300mg was given to a single patient, 7 patients were given 325mg of Ecospirin and 32 patients were not given any medications. With a sample size of 150 in the IP department males associated with chest pain and SOB were 30 and 40 respectively, and for OP department it was 5 in IP and 5 in OP. Females with chest pain and SOB were 14 and 17 respectively, and OP is 1 for chest pain and 1 for SOB.

Below 120/80: 33 patients (22%), 11 patients (7%), had a blood pressure of 120/80. 120/90-140/100 was observed in 61 cases, accounting for 41%. 145/85-150/100 was seen in 13 individuals, accounting for 9% of the total sample size. A total of 18 individuals with blood pressures ranging from 152/65 to 170/100 were recorded in 12% from the sample population. Whereas 180/80-200/100 was seen in 12 individuals with 8% of the sample population and bp above 200 was found in a single case, accounting for 1% of the sample total Antiplatelets drugs prescribed includes Ecospirin which was given to 103 patients in IP and 16 patients in OP, clopidogrel was given to 66 IP patients and 5 OP patients, ticagrelor was given to 19 IP patients and no OP patient was given this drug. Tirofiban was given to single IP patient and no OP patient was given this. Class of Antiplatelet prescribed in sample size 150 patients in 119 patients COX inhibitors were prescribed, in 91 patients P2Y12 was given, and 1 patient was given GP2b/3a and no patient was given PD inhibitor AND PAR- 1 inhibitors.

ASSOCIATED CLINICAL MANIFESTATION

Table 1 Associated Clinical Manifestations Graph 1 Associated Clinical Manifestations

Patients	Chest pain	Chest pain	Sob	Sob
	Male	Female	Male	Female
IP	30	14	40	17
OP	5	1	5	1

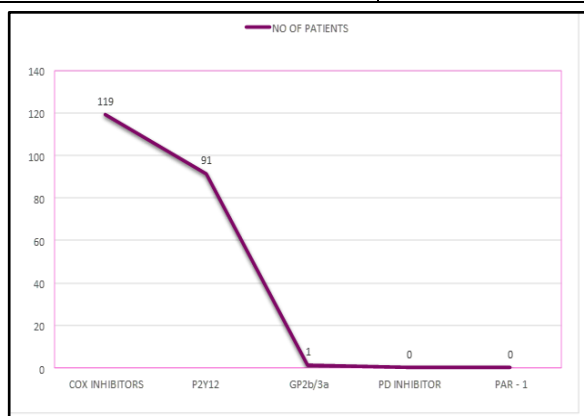


With a sample size of 150 in the IP department males associated with chest pain and SOB were 30 and 40 respectively, and for OP department it was 5 in IP and 5 in OP. Females with chest pain and SOB were 14 and 17 respectively, and OP is 1 for chest pain and 1 for SOB.

ANTIPLATELETS PRESCRIBED

Table 2 Classes of Anti platelets Prescribed

Classes of anti platelets prescribed	No.of patients
COX INHIBITORS	119
P2Y12	91
GP2b/3a	1
PD INHIBITOR	0
PAR - 1	0



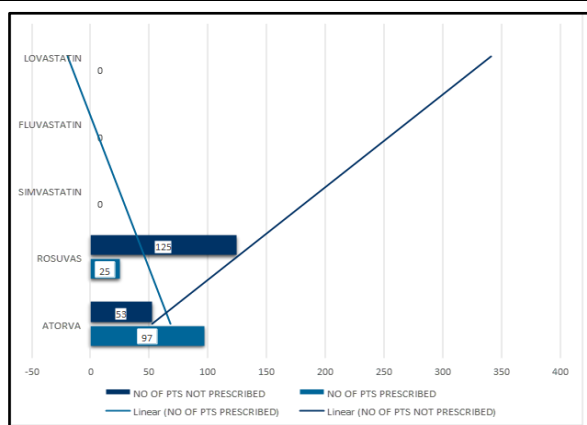
Graph 2 classes of antiplatelets prescribed

Class of Antiplatelet prescribed in sample size 150 patients in 119 patients COX inhibitors were prescribed, in 91 patients P2Y12 was given, and 1 patient was given GP2b/3a and no patient was given PD INHIBITOR AND PAR-1 INHIBITORS.

STATINS PRESCRIBED

Table 3 Number of statins prescribed in patients

Statins	No. Of patients prescribed	No. Of patients not prescribed
Atorva	97	53
Rosuvastatin	25	125
Simvastatin	0	0
Fluvastatin	0	0
Lovastatin	0	0



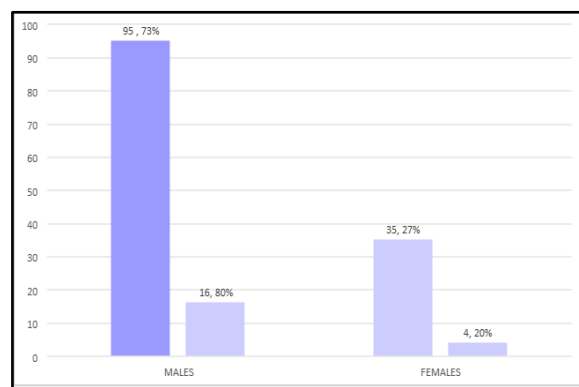
Graph 3 number of statins prescribed in patients

Atorva was prescribed to 97 patients and it was not prescribed to 53 patients, rosuvastatin was prescribed to 25 patients and was not prescribed to 125 patients. Simvastatin, fluvastatin and lovastatin were not prescribed at all to any patients.

GENDER WISE DISTRIBUTION

Table 4 gender wise distribution Graph 4 gender wise distribution

Males	Females
95	35
15	04



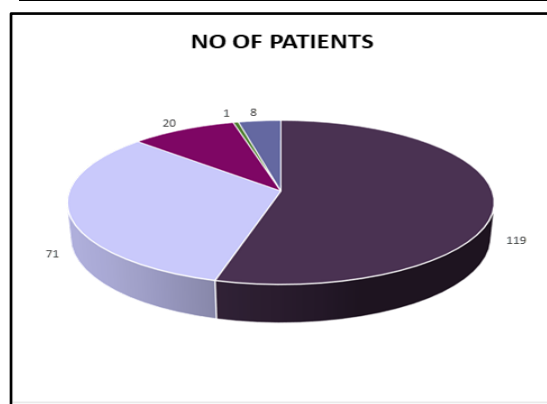
Graph 4 gender wise distributions

Out of 150 sample size (95)73% males were found to be in IP department and (16) 80% males were in OP and in case of females in IP department (35) 27% females were found and to OP department (4) 20% males were reported.

MAJORITY OF ANTIPLATELETS PRESCRIBED

Table 5 Majority of antiplatelets prescribed

Anti-platelet drugs prescribed	No of patients
Ecosprin	119
Clopidogrel	71
Ticagrelor	20
Tirofiban	1
No anti-platelets	8



Pie chart 1 Majority of antiplatelets prescribed

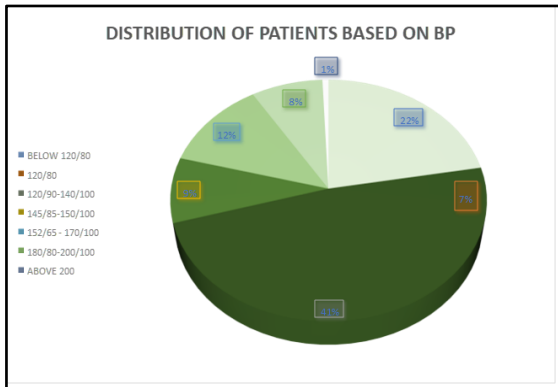
In a sample size of 150 patients from both IP and OP department the Antiplatelet drugs prescribed were Ecosprin, Clopidogrel, ticagrelor, tirofiban. The no of patients on ecosprin were 119, clopidogrel was given to 71 patients,

ticagrelor was given to 20 patients and 1 patient was prescribed tirofiban and no Antiplatelets was given to 8 patients.

DISTRIBUTION OF PATIENTS BASED ON BLOOD PRESSURE

Table 6 distribution of patients based on blood pressure

Blood pressure	No of patients
Below 120/80	33
120/80	11
120/90-140/100	61
145/85-150/100	13
152/65 - 170/100	18
180/80-200/100	12
Above 200	1



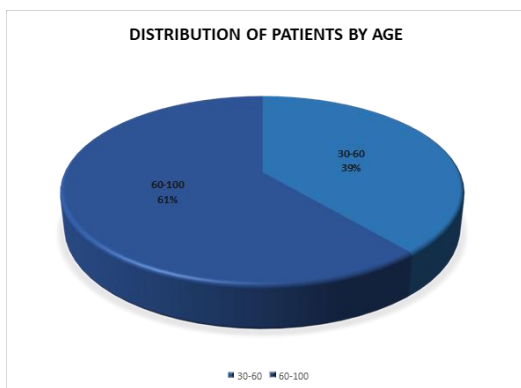
Pie chart 2 for distribution of patients based on blood pressure

BELOW 120/80: 33 patients (22%), 11 patients (7%), had a blood pressure of 120/80. 120/90/140/100 was observed in 61 cases, accounting for 41%. 145/85-150/100 was seen in 13 individuals, accounting for 9% of the total sample size. A total of 18 individuals with blood pressures ranging from 152/65 to 170/100 were recorded, accounting for 12% of the total. 180/80-200/100 was seen in 12 individuals, accounting for 8% of the sample total. Above 200 was found in a single case, accounting for 1% of the sample total.

DISTRIBUTION OF PATIENTS BASED ON AGE

Table 7 age wise distribution Pie chart

Age	No of Patients
30-60	59
60-100	93



From sample size of 150 patients, (93) 61 % of patients were from the age group of 60-100 years and 39 % (59) of patients

were in the age group of 30-60 years. Patients younger than 18 years were excluded from the study based on the exclusion criteria

STATISTICAL P - VALUE BASED ON DIFFERENT PARAMETERS AND MEDICATION THERAPY

Parameters	All patients	Patients Using Statins	Patients Using Anti Platelet Therapy	Patients using DAPT therapy
Age				
Mean (SD)	64 (11.92)	63.8(11.9)	63.52(12)	61.94(11.7)
P - value		0.397	0.321	0.925
Gender				
M		73	95	40
F		31	32	17
P-value		<0.001	<0.001	<0.001
Complaints				
Chest pain		39	47	28
P - value		<0.001	<0.001	<0.001
SOB		44	51	23
P - value		<0.001	<0.001	<0.001
Comorbidities				
DM		63	77	35
P - value		<0.001	<0.001	<0.001
HTN		74	93	36
P - value		<0.001	<0.001	<0.001
Thyroid		12	15	7
P - value		<0.001	<0.001	<0.001
Lab investigation (Hb levels)				
Mean (SD)		11.83(2.4)		
P-value		<0.001		

SPEARMAN'S RHO TEST

AGE correlated with dosage	Spearman's correlation coefficient	P-value
Ecosprin	0.057	0.487
Clopidogrel	0.082	0.319
Ticagrelor	0.336**	<0.001
Atorvastatin	-0.155	0.058
Rosuvastatin	0.034	0.682

**correlation is significant at the 0.01 level (two-tailed)

The descriptive studies were used to analyse the demographic profile, baseline, and clinical characteristics of the study population. Cardiac events are represented as percentages, continuous variables are reported as numbers and compared with their independent t-test. Spearman's rho test was used to determine if there was a relation between age of patients and the dose prescribed for given medications. The results were depicted in the form of tables and graphs which were generated by Microsoft word and excel. The statistics was performed by using SPSS software version 20.0. A p - value less than 0.05 was considered statistically significant

DISCUSSION

In Our study, we found that antiplatelet drugs and statins are commonly prescribed for the therapeutic management of coronary artery disease and other related disorders, patients included in our study were above 50 years of age evident that coronary artery disease are most commonly seen in elderly patients.

Aspirin in addition with clopidogrel was the most common drug combination given to patients and then ticagrelor with aspirin was next common drug combination prescribed this type of treatment containing 2 antiplatelets is known as dual antiplatelet (DAPT) therapy. Usually a combination of Antiplatelet such as aspirin and statin were also prescribed, the most commonly prescribed statin is atorvastatin under the brand name aztor and the next most commonly prescribed statin is rosuvastatin under the brand name rosuvas.

Diagnosis of CAD was usually done by Coronary angiography, 2d Echo, and Colour Doppler. Unstable Angina was diagnosed by an abnormal ECG followed by angiography. In addition to shove tests, D-dimer values were also recorded to assess patient's exposure to development of clots in the body.

Hypertension was the most common comorbidity found in our subjects. Diabetes Mellitus was the next most commonly found comorbidity. In several patients. Hypertension, diabetes was seen in most of our subjects.

antiplatelet drugs which were rarely used or not used at all include: prasugrel, Tirofiban, Ticlopidine. Newer drugs like Cangrelor, Eptifibatide, Cilostazol were not prescribed at all.

The study included 180 sample size which included coronary artery disease and their sub types. Newer medications were not prescribed at our place of study. Further studies are required to understand the efficacy fewer drugs. A chief complaint experienced was usually chest pain mostly in males followed by shortness of breath which is also experienced mostly in males. It is mostly seen in retrospective study and then in prospective study.

Author contribution

All the authors has made contribution in conceptualization and designing of the study and analysis of the same, contributed to acquisition of data along with analysis and interpretation of data has been involved in revising it critically for intellectual content, given final approval of the version to be published. Lastly all of them were involved in drafting the manuscript along with revising the same for intellectual concept.

CONCLUSION

Result of the study showed that both antiplatelets and statins are used for coronary artery disease treatment. However aspirin, clopidogrel each along with atorvastatin was the best

possible combination and showed statistically significant improvement.

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