

**A STUDY ON ANTIPLATELET MEDICATION USED IN CARDIOVASCULAR DISEASE**Suneey Sen\*<sup>1</sup>, Mahadevamma L.<sup>2</sup> and Akash Nair M.<sup>3</sup><sup>1</sup>PharmD Intern Student, East-West College of Pharmacy, Bengaluru.<sup>2</sup>Associate Professor and HOD, Dept. of Pharmacy Practice, East-West College of Pharmacy, Bengaluru.<sup>3</sup>PharmD Intern Student, East-West College of Pharmacy, Bengaluru.**\*Corresponding Author: Suneey Sen**

PharmD Intern Student, East-West College of Pharmacy, Bengaluru.

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**ABSTRACT**

Cardiovascular diseases are the leading cause of death globally. A cardiovascular disease is a group of heart and blood vessels disorders that is the most frequent diagnosis in elderly patients. Antiplatelet therapy is intended to prevent and reverse platelet aggregation in arterial thrombosis in high-risk CVD patients. A study on the antiplatelet medication used in cardiovascular diseases Methodology: This was a prospective and observational study that was performed on 90 subjects, in the cardiology department. Out of 90 patients, 67 were male (74.4%) and 23 were female (25.6%). The age distribution shows that patients aged above 60 years were more predominantly using antiplatelet medication. Based on the distribution of therapy 35 patients were prescribed monotherapy (39%), 55 patients were prescribed with combination therapy (61%). Aspirin was prescribed as monotherapy (37.8%), whereas aspirin & clopidogrel as combination therapy (43%) were prescribed to get better therapy outcomes (100% recovered). Most commonly found ADR was GI bleeding because of Aspirin and risk factors included obesity (96.70%) followed by hypertension, Diabetes mellitus and age. This study reveals that due to gender, an increase in age & changes in social habits leads to CVD. Aspirin & clopidogrel were more useful combination therapy than monotherapy aspirin. Finally, we concluded that combination therapy has better recovery outcomes in CVD treatment. Most ADRs were found in monotherapy.

**KEYWORDS:** Antiplatelet Medication, Cardiovascular disease, combination and monotherapy.**INTRODUCTION**

The antithrombotic action of antiplatelets has long been recognized. Antiplatelet drugs like aspirin inhibit platelet function through irreversible inhibition of cyclooxygenase (COX) activity and clopidogrel selectively inhibits the binding of adenosine diphosphate (ADP) to its platelet P2Y<sub>12</sub> receptor and the subsequent ADP-mediated activation of the glycoprotein GP IIb/IIIa complex, thereby inhibiting platelet aggregation etc. These action of antiplatelet prevents the occurrence of angina, coronary artery disease, heart attack, stroke and transient ischemic attacks, peripheral artery disease, which is caused due to clot formation, inflammation and narrowing of blood vessels. Hence antiplatelet action of aspirin, clopidogrel, ticagrelor, prasugrel stop the progression of clots and inflammation and avoid serious consequences. This study aims to review the literature concerning the various mechanisms of the newly discovered effects of antiplatelet in the prevention of the development of venous thrombosis which is associated with CVD. This study will be beneficial to manage the ADRs & other possible interactions with the patient who are undergoing Antiplatelet therapy in CVD. This will be helpful for the prescriber to understand the appropriate

effect of the antiplatelets in CVD patients during treatment and helps to get proper treatment outcomes. This study will contribute to preventing serious risks of CVD like ischemic stroke, angina etc. in patients who are at high risk of it.<sup>[1,2,3]</sup>

**MATERIALS AND METHODS**

The study was conducted in the General Medicine and Cardiology department of Sagar Multispecialty Hospital, Bengaluru. Study design: A Prospective and Observational study was performed on 90 patients to assess antiplatelet medication used in CVD. Sample size: A total of 90 patients from the General Medicine and Cardiology department of Sagar Multispecialty Hospital, who satisfied the study criteria and consented to participate in this study were included for the study. The study was conducted over for 06 months starting from November 2020 to April 2021 Ethical approval: Ethical committee clearance has been obtained by the institutional ethical committee of Sagar Multispecialty Hospital. Inclusion Criteria was Patients visiting both IPD and OPD, Patients prescribed with antiplatelet drugs, patients diagnosed with risk factors of cardiovascular disease and exclusion criteria was

pregnant and lactating women, neonates and children, cancer patients. Patients with cardiovascular disease who were admitted to the General Medicine and Cardiology department of Sagar Multispecialty Hospital in Bengaluru during the study period, for different treatment approaches, were selected and screened based on the inclusion and exclusion criteria. Patients who met with the inclusion and exclusion criteria and who consented to the study were enrolled for the study. A Prospective and Observational study was conducted in the Department of Cardiology. To assess the patient risk factors, we used baseline information such as demographic details like age, sex, weight, date of admission and date of discharge, body mass index, a social history which was obtained from the patients. We assessed the drug ADRs by collecting the drug-related data such as the name of drugs, doses, route of administration, duration, possible ADRs collected and documented in a suitably designed data collection form. To evaluate the comparison of mono and combination therapy of antiplatelet medication we used patient treatment charts, discharge medication which is prescribed with the antiplatelet class of drugs and its dose, frequency, route of administration and duration. Drug information software such as LEXICOMP & Micromedex and textbook available in the department was used for further reference.

## RESULTS

Subjects were being distributed according to gender. In the total identified population, the male gender number 67 (74.40%) and female gender 23 (25.60%). Here the results indicate that males have a higher prevalence rate than females. [table no. 1]

From the distribution of subjects according to age, a greater number of patients were identified at the age group > 61 years (> 50%) and the least was found in the age group 31- 40 years (2.2%). [table no. 2]

As shown in table No.3 shows various social habits. Out of 90 patients, 26 patients were smokers, 30 patients were alcoholic, 22 patients were vegetarians and 68 patients were non-vegetarians. In our study, it was found that the maximum number of people were non-vegetarians 68 followed by alcoholics, smokers and vegetarians having 30, 26 and 22 people respectively. [table no. 3]

As shown in table No.4 shows various risk factors. Out of 90 patients, the maximum number of patients were above the normal BMI which included 87 people followed by hypertension having 75 people and diabetes mellitus followed by age, obesity, alcohol and smoking which have 64, 63, 42, 29 and 27 people respectively. In our study, it was found out that a maximum number of people were overweight/obese/BMI 96.70% followed by hypertension (83.30%), diabetes mellitus (71.10%), age (70%), alcohol (32.20%) and smoking (30%). [table no. 4]

From the distribution of subjects according to combination therapy, we found that maximum people have treated with aspirin + clopidogrel comprising of 39 patients and 43.30% followed by aspirin + clopidogrel + ticagrelor and aspirin + ticagrelor having 8 patients comprising 8.9% and 8 patients and 8.9% respectively. [table no. 5]

From the distribution of outcome vs combination therapy, we found out that aspirin + clopidogrel had a better recovery outcome of 39 subjects out of 90 patients & recovery rate is 43% followed by aspirin + clopidogrel + ticagrelor and aspirin + ticagrelor having recovery outcomes of 9% and 9% respectively. [table no. 5.1]

From the distribution of subjects according to monotherapy, it was found out that maximum people were treated with aspirin comprising of 34 patients and 37.8% followed by ticagrelor having 1 patient and comprising 1.1%. [table no. 6]

From the distribution of outcome vs monotherapy, we found that the maximum outcome was seeing with aspirin having 38% patients' recovery rate followed by ticagrelor having an outcome of 1%. [table no. 6.1]

From the distribution of subjects according to ADRs, we found out that the maximum adverse drug reaction seen was GI bleeding which was seen in 21 patients comprising 23.3% followed by gum bleeding which was seen in 1 patient and comprised 1.1% of the total patients enrolled. [table no. 7]

## ILLUSTRATIONS

### TABLES

**Table No. 1: Distribution of subjects according to Gender.**

Gender	Frequency	Per cent
Male	67	74.4
Female	23	25.6
<b>Total</b>	<b>90</b>	<b>100.0</b>

**Table No. 2: Distribution of subjects according to Age group.**

Age group	Frequency	Per cent
31 to 40	2	2.2%
41 to 50	9	10.0%
51 to 60	17	18.9%
61 to 70	39	43.3%
71 to 80	19	21.1%
81 to 90	4	4.4%
<b>Total</b>	<b>90</b>	<b>100.0%</b>

Table No. 3: Distribution of subjects according to social habits.

Smoking	Frequency	Per cent
Yes	26	28.9
No	64	71.1
<b>Alcoholic</b>		
Yes	30	33.3
No	60	66.7
<b>Diet</b>		
Veg	22	24.4
Non-veg	68	75.6

Table No. 4: Distribution of subjects according to risk factor.

Risk Factors	Frequency	Per cent
<b>Alcohol</b>		
Yes	29	32.2
No	61	67.8
<b>Smoking</b>		
Yes	27	30.0
No	63	70.0
<b>Obesity</b>		
Yes	42	46.7
No	48	53.3
<b>Hypertension</b>		
Yes	75	83.3
No	15	16.7
<b>DM</b>		
Yes	64	71.1
No	26	28.9
<b>BMI</b>		
Yes	87	96.7
No	3	3.3
<b>AGE</b>		
Yes	63	70.0
No	27	30.0

Table No. 5: Distribution of subjects according to combination therapy.

Combination Therapy	Frequency	Per cent
ASP+CLO	39	43.3%
ASP+CLO+TIC	8	8.9%
ASP+TIC	8	8.9%
Monotherapy	35	38.9%
<b>Total</b>	<b>90</b>	<b>100.0%</b>

Table No. 5.1: Outcome Vs Combination therapy.

Therapy	Drug Name	Frequency	Per cent	Outcome
Combination Therapy	ASP+CLO	39	43%	Recovered
	ASP+CLO+TIC	8	9%	Recovered
	ASP+TIC	8	9%	Recovered
	Monotherapy	35	39%	Recovered
<b>Total</b>		<b>90</b>	<b>100%</b>	<b>Recovered</b>

**Table No. 6: Distribution of subjects according to monotherapy.**

Monotherapy	Frequency	Per cent
ASP	34	37.8%
TIC	1	1.1%
Combination Therapy	55	61.1%
<b>Total</b>	<b>90</b>	<b>100.0%</b>

**Table No. 6.1: Outcome Vs Monotherapy.**

Therapy	Drug Name	Frequency	Per cent	Outcome
Monotherapy	Aspirin	34	38%	Recovered
	Ticagrelor	1	1%	Recovered
	Combination Therapy	55	61%	Recovered
<b>Total</b>		<b>90</b>	<b>100%</b>	<b>Recovered</b>

**Table No. 7: Distribution of subjects according to ADRs.**

ADRs	Frequency	Per cent
GI Bleeding	21	23.3%
Gum Bleeding	1	1.1%
No ADRs	68	75.6%
<b>Total</b>	<b>90</b>	<b>100.0%</b>

## DISCUSSION

The selection of antiplatelet in patients with cardiovascular disease is complex and equivocal, owing majorly to the non-adherence to standard clinical guidelines. Moreover, there is a scarcity of data on the utilization pattern of antiplatelet in the Indian population. Our primary objective was to analyse the use of antiplatelet medication in cardiovascular disease. The secondary objective was to assess the patient risk factors, ADRs of antiplatelet therapy and to evaluate the comparison study of mono and combination therapy in antiplatelet medication. Irrespective of the advancements in understanding the use of antiplatelets in CVS disorder further exploration about the effectiveness of antiplatelets is required. Hence, the present research work is designed to further evaluate the use of antiplatelets in cardiovascular disease.

### Gender

Table No.1 represents the total number of male and female patients, out of 90 patients 67 were male and 23 were female comprising 74.4% and 25.6% respectively. This represents that there were a greater number of male patients with cardiovascular diseases enrolled in the study. Similar findings were found in the study conducted by Emil G Rajesh, Mohammed Jasim, Riya Ann Roy, Sandra Alappattu, V Karthikeyan, Neelakantan V where 68% were male and 32% were female indicating that antiplatelets are prescribed more in males than in females.

### Age

As shown in table No.2 age group of 18 to 90 were enrolled in the study. The maximum number of patients

were seen in the age group of 61-70 years with 39 patients (43.3%). This was followed by the age group of 71-80 years with 19 patients (21.1%) as compared to other age groups which are 51-60, 41-50, 81-90 and 31-40 giving a percentage of 18.9%, 10.0%, 4.4% and 2.2% respectively. The lowest number was seen in the age group of 31-40 years. Similar findings were found in the study conducted by Emil G Rajesh, Mohammed Jasim, Riya Ann Roy, Sandra Alappattu, V Karthikeyan, Neelakantan V were age 50 years, for an individual whose lifestyle risk factors remains unchanged. In our study population, 129 patients were affected in the age group of 50 to 60 years.

### Social Habits

As shown in table No.3 shows various social habits. Out of 90 patients, 26 patients were smokers, 30 patients were alcoholic, 22 patients were vegetarians and 68 patients were non-vegetarians. In our study, it was found that the maximum number of people were non-vegetarians 68 followed by alcoholics, smokers and vegetarians having 30, 26 and 22 people respectively. Similar findings were found in the study conducted by Emil G Rajesh, Mohammed Jasim, Riya Ann Roy, Sandra Alappattu, V Karthikeyan, Neelakantan V were most of the patient profiles is having 15% of samples were smokers, 4% were alcoholics and 23% were both alcoholics and smokers.

### Risk Factors

As shown in table No.4 shows various risk factors. Out of 90 patients, the maximum number of patients were above the normal BMI which included 87 people followed by hypertension having 75 people and diabetes mellitus followed by age, obesity, alcohol and smoking which have 64, 63, 42,29 and 27 people respectively. In our study, it was found out that maximum people were overweight/obese followed by hypertension, diabetes mellitus, age, obesity, alcohol and smoking. Similar findings were found in the study conducted by Emil G Rajesh, Mohammed Jasim, Riya Ann Roy, Sandra Alappattu, V Karthikeyan, Neelakantan V were most of the patient profiles is having comorbid conditions, 27% of patients having diabetes, 5% having renal disorders,

2% of each alcoholic and smokers. While 15% of samples were smokers, 4% were alcoholics and 23% were both alcoholics and smokers.

### Therapy

As shown in table No.5 and table No.6 respectively shows the therapy given. Out of 90 patients' the maximum number of people were treated with aspirin+ clopidogrel having 39 people followed by aspirin having 34 people, followed by aspirin + clopidogrel + ticagrelor, aspirin + ticagrelor and ticagrelor having 8, 8 and 1 people respectively. In our study, it was found that maximum people were treated with combination therapy when compared with monotherapy. Similar findings were found in the study conducted by Emil G Rajesh, Mohammed Jasim, Riya Ann Roy, Sandra Alappattu, V Karthikeyan, Neelakantan V where the majority of patients were prescribed aspirin in both males (62%) and females (41%) followed by other categories. In females, aspirin+atorvastatin+ clopidogrel combination is 34%, aspirin + atorvastatin is 20%, followed by 1% in clopidogrel, aspirin +clopidogrel, aspirin along with aspirin + atorvastatin. In males 12% was found in aspirin + atorvastatin, 14% in aspirin + atorvastatin +clopidogrel combination.

### Outcome

As shown in table No.5.1 and 6.1 which shows outcomes found in both monotherapy and combination therapy. Out of 90 patients 55 patients were treated with combination therapy which includes aspirin + clopidogrel the most having 39 patients and 43.3% followed by aspirin + clopidogrel + ticagrelor having 8 patients and comprising 8.9% followed by aspirin + ticagrelor having 8 patients which comprise 8.9%. out of 90 patients, 35 patients were treated with monotherapy which includes aspirin the most having 34 patients and 37.8% followed by ticagrelor having 1 patient and comprising 1.1%. in our study, it was found that combination therapy had the maximum outcome followed by monotherapy. Similar findings were found in the study conducted by Chamila M Geeganage, Hans-Christoph Diener, Ale Algra, Christopher Chen, Eric J Topol, Reinhard Dengler et al Dual antiplatelet therapy appears to be safe and effective in reducing stroke recurrence and combined vascular events in patients with acute ischemic stroke or transient ischemic attack as compared with monotherapy.

### Adverse Drug Reactions

As shown table No.7 it shows various adverse reactions. Out of 90 patients, 21 patients had GI bleeding which comprises 23.3% of total adverse drug reactions and 1 patient had gum bleeding comprising 1.1% of total adverse drug reactions. In our study, it was found out that maximum people didn't have any adverse drug reaction but some people faced ADR in which GI bleeding was seen the most followed by gum bleeding. From table no.9, it was found out that ADRs mostly occurs in male patients with a percentage rate of 71.40%

GI Bleeding and 100% gum bleeding whereas in the case of female patients it was only 28.60% which is less than male patients. Similar findings were found in the study conducted by Jacques Bouget, Frédéric, Balusson, Damien, Viglino, Pierre-Marie, Roy, Karine, Lacut, Laure Pavageau, Emmanuel Oger where the main outcome measure was time to major bleeding (GI, ICH and other bleedings). We used Inverse Propensity of Treatment Weighting as a stratified sensitivity analysis according to the antiplatelet monotherapy indication: primary prevention without cardiovascular (CV) risk factors, with CV risk factors, and secondary prevention.

### CONCLUSION

Cardiovascular diseases are the leading cause of death globally. A cardiovascular disease is a group of disorders of heart and blood vessels which includes coronary artery disease, peripheral artery disease and congenital heart disease, myocardial infarction. They are found most commonly in males over the age of 50 years. Patients were evaluated and diagnosed on the bases of a few commonly observed symptoms like chest pain, chest discomfort, breathlessness and fatigue. Antiplatelet agents decrease the thrombus formation by reducing the ability of platelets to aggregate together.

In our study, a total of 90 subjects were enrolled assessed and evaluated. Both male and female patients were enrolled in this study and it was found that male patients (74.4%) were more than female patients. The age distribution was studied from 18 years and above, the maximum distribution was seen in patients between 61 to 70 years (43.3%). In our study, aspirin + clopidogrel combination were prescribed the most, followed by aspirin. Based on the distribution of therapy most of the patients were treated with combination therapy and the better recovery outcome was seen maximum in combination therapy as compared to monotherapy. Most ADRs were found in monotherapy.

Treatment was based on ECG, troponin, 2-D echo, TMT, CBC levels of the patient which were monitored frequently by using antiplatelet monotherapy and combination therapy. The efficacy of the antiplatelet therapy was observed based on troponin, 2-D echo and TMT during the time of admission and discharge. The troponin, TMT, 2-D echo values showed that there is a significant rise in the average values of all these parameters and all this indicated heart problem/damage.

The study revealed that combination therapy of antiplatelet medication was having better recovery outcomes as compared to monotherapy. Most of the patients had no adverse effects but in some cases, GI bleeding was seen because of long term use of aspirin monotherapy. The study showed the damage to the heart and blood vessels were well under control and the therapy was found to be effective. This study also allows a comparison of the situation with other regions within and outside the state as well as in the country. This study

is important for clinicians to facilitate empiric treatment of patients and manage symptoms of cardiovascular disease.

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