

A Prospective Study on Drug Utilization, Cost Impact & Gastric Bleeding Associated with Anticoagulant Therapy at Cardiology Department in a Tertiary Care Hospital

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Abstract:- Background: Anticoagulants are the class of drugs that are used to prevent thrombus extension and embolic complications by reducing the rate of fibrin formation. They do not dissolve already formed clot but prevent recurrences.

Method: 200 patients from the cardiology inpatient department who were suffering from Cardiovascular Diseases were included in this prospective, uni-centric, observational study conducted in tertiary care hospital, Bangalore.

Results: Cardiovascular disease was observed to be highest in patients with the age group of 58-67 years. We observed that 122 patients were treated with anticoagulants+antiplatelets, 75 were treated with anticoagulants only. The most common co-morbid conditions observed by us were HTN. Out of 200 prescriptions encountered 198 prescriptions have rational use of anticoagulants and only 2 were irrational. The polypharmacy was observed to be practiced in the management of CVD which increases the economic burden of the patients.

Keywords:- DUE, Anticoagulants, Bleeding.

I. INTRODUCTION

Anticoagulants are the drugs used to prevent blood clots by reducing the rate of fibrin formation. They do not dissolve already formed clot but prevent recurrences. In a hospital setting anticoagulants are mainly used for the following indications like deep vein thrombosis(DVT), pulmonary embolism(PE), myocardial infarction(MI), unstable angina, rheumatic heart disease, vascular surgery, prosthetic heart valve, retinal vessel thrombosis, extra corporeal circulation, haemodialysis and deep fibrination syndrome.¹

Throughout the world high morbidity and mortality is associated with CVD. The various risk factors for CVDs are elevated cholesterol and blood pressure levels, excessive smoking habits, diabetes, malnutrition and obesity². The leading cause of death in India is CVD, India will notice a large number of people between 35 and 64 years die of CVD over the next 30 years as well as an increasing level of morbidity due to CVD.³

Cardiovascular disease (CVD) affects the heart and circulatory system.³ Coronary artery diseases (CAD) is mainly

due to atherosclerosis of the inner lining of the blood vessels that supply blood to the heart. CAD begins when cholesterol is deposited within a coronary artery. The plaques narrow the internal diameter of the arteries which results in tiny clots which obstructs the blood flow to the heart muscle. The oxygen and nutrients to the heart muscles are reduced which is essential for proper functioning of heart. This may eventually result in a portion of heart being suddenly deprived of its blood leading to death of that area of heart tissue resulting in a chest pain or heart attack. The treatment for CAD involves the use of various categories of drugs namely antiplatelet drugs, anticoagulants, antianginal drugs, beta blockers, angiotensin converting enzyme inhibitors (ACEI)/angiotensin II receptor blockers(ARBs), calcium channel blockers, diuretics, etc.⁴

Drug utilization pattern study is an important tool to measure the appropriateness of prescriptions. It is a descriptive and analytical method of collection, quantification, understanding and evaluation of the prescription pattern as well as dispensing and consumption for the advancement of existing therapy and enhancement of patient safety. Drug utilization research manages drug specific problems. Identification and assessment of the prescription pattern helps in improving both medication quality and patient safety. Medication quality and patient safety requires a rational prescription of medication and avoidance of inappropriate/irrational prescription patterns.⁵

Rational prescription of drugs leads to efficient and safe drug use according to clinical needs for an adequate period and at the minimum available cost. Prescribing unnecessarily branded drugs, the cost issue, inadequate drugs supply, and lack of patient counseling regarding dosing schedules and possible side effects are the major causes of irrational use of drugs, which may result in failure of therapy and unwanted side effects.⁵ Measurement of prescription pattern in health care systems not only describes drug use pattern but also helps in the identification of polypharmacy and the problems associated with it like drug related problems, polypharmacy is a significant problem with cardiovascular inpatients admitted for a prolonged period of time.³

The evidence of bleeding with OAC varies widely in published studies. Factors affecting are age, genetics, prior stroke, history of bleeding, anaemia, co-morbidity (hypertension, renal insufficiency, liver disease), antiplatelet agents, NSAIDs, medication that affects the intensity of anticoagulation, alcohol abuse. The intensity of the anticoagulant effect is the important risk factor for

hemorrhage. Studies indicate that with a target INR of >3.0 the incidence of major bleeding is two-fold greater compared to those with a target INR of 2.0-3.0, atleast in some patient groups.⁶

II. METHODOLOGY

This was a prospective, unicentric, observational study conducted in 200 patients suffering from cardiovascular disease(CVD) at Cardiology Inpatient(IP) department of tertiary care hospital, Bangalore.

A. Inclusion criteria.

- All individuals of either sex are above 18 years of age.
- Diagnosed with cardiovascular complications.
- Those who are on anticoagulant therapy.

B. Exclusion criteria.

- Patients on dialysis receiving anticoagulants.
- Patients with incomplete case record forms.

A suitable data collection form was designed to collect and document the data. Data collection form included the provision for collection of information related to socio-demographic details of the patients, pertaining to age, gender, family history, smoking status, daily alcohol consumption, assessment of diet were obtained and recorded.

The mean prescription cost was determined. The mean prescription cost was calculate for about 7 days for each case, irrespective of the total number of days stayed as inpatients in the ward. The data was updated timely and analysed using microsoft excel.

III. RESULTS

- In our study, mean age was found to be 60.3±12.4years. The highest number of male (28.3%) were in the age group of 58-67 years. The highest number of female (26.9%) was in the age group of 58-67 years.

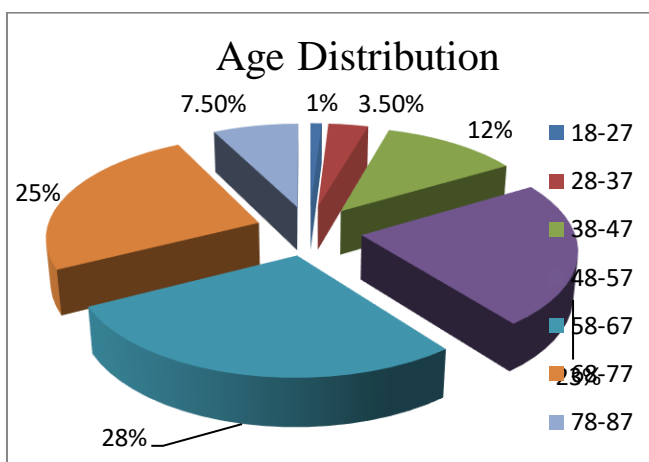


Fig 1:- Age Distribution of the Study Population

- In our study population, the highest percentage (60%) of patients is prescribed with unfractionated heparin.

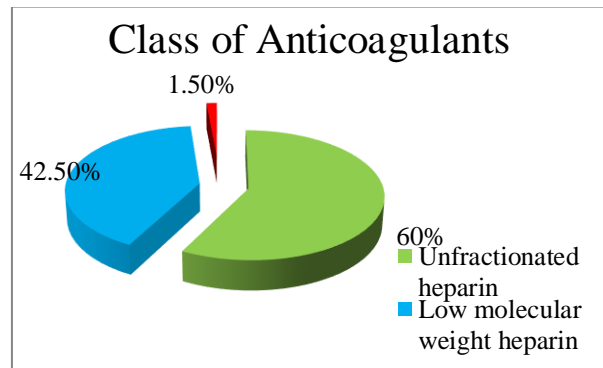


Fig 2:- Pie Chart Representation of Anticoagulants in our Study Population

- In our study population 37.5% were prescribed with monotherapy and 61% were prescribed as combination with antiplatelets.

Prescribing pattern	Male patients n=148 (%)	Female patients n=52 (%)	Total number of patients n=200 (%)
Mono therapy	53 (35.8)	22 (42.3)	75 (37.5)
Combinational therapy with Antiplatelets	95 (64.2)	27 (52)	122 (61)
Triple therapy	0 (0)	3 (5.8)	3 (1.5)

Table 1. Anticoagulant Prescribing Pattern

- In our study population, 1421 drugs are prescribed among which 40.4% were injections and 6.6% were antibiotics.

Prescribing indicators assessed	Number of drugs (n=1421)	Percentage
Number of drugs prescribed	1421	100%
Number of injections prescribed	569	40.40%
Number of antibiotics prescribed	94	6.60%
Drugs prescribed in generic name	153	10.70%
WHO essential drug list	205	14.40%

Table 2. Assessment of Prescribing Pattern According to WHO Prescribing Indicators

- Out of 200 prescriptions encountered, 198 (99%) prescriptions has rational use of anticoagulants and 2 (1%) were irrational.

IV. DISCUSSION

The mean age of the patients with Cardiovascular Disease in our study population was found to be 60.3±12.4 years (figure 1). Our study shows the majority of male patients 42 (28.3%) were in age group of 58-67 years whereas 14(26.9%) female patients were in age group of 58-67 years. In our study out of 200 patients, 120(60%) of the patients were prescribed with unfractionated heparin which was highest followed by Low molecular Weight heparin 85(42.5%) and the least prescribed was OAC 3(1.5%) (figure 2). The details of the prescribing pattern of Anticoagulant when assessed showed 75(37.5%) were prescribed with ACs as monotherapy, 122(61%) were prescribed ACs along with an antiplatelet. 3(5.8%) females were prescribed with triple therapy in combination of two anticoagulants and one antiplatelet drug (table 3).

Out of 200 prescription analyzed among total of 1421 drugs, in which 40.4% were injections, 6.6% were antibiotics, 10.7% drugs were prescribed in generics and 14.4% drugs were prescribed from WHO. The average number of drugs per encounter was found to be 7-8. The frequency of polypharmacy was higher in this hospital setting (table 4). Out of 200 prescription encountered, it was found that 198 (99%) of the prescription had rational use of anticoagulants where as 2(1%) found to be irrational according to the ACCP guidelines (figure 5). In our study population, it was observed that only 1 (0.5%) of the total study population presented with GI bleeding as a side effect where as it was not seen in the 199 (99.5%) of the remaining population (figure 6). Cost of prescription is important in chronic condition (CVD). One of the better approaches to decrease the prescription cost is to prescribe the cheaper brands of drugs. In our study population, 45.5% of patients have spent in the range of 7500-8500 INR per week for Anticoagulants and the mean prescription cost of anticoagulants per week was found to be 6582.3±2368.65 (figure 7).

V. CONCLUSION

In the present study, the prevalence of CVD was high with increasing age. The male patients with an age group of 58-67years were most affected. The study also concluded that most of the drugs were prescribed according to ACCP guidelines. The use of AC and antiplatelet combination was seen in most of the patients which adds value in the effective treatment as well as prevention of IHD. Various potential drug interactions were encountered in the prescription. Polypharmacy was observed to be practised in the management of CVD which increases the economic burden of the patients.

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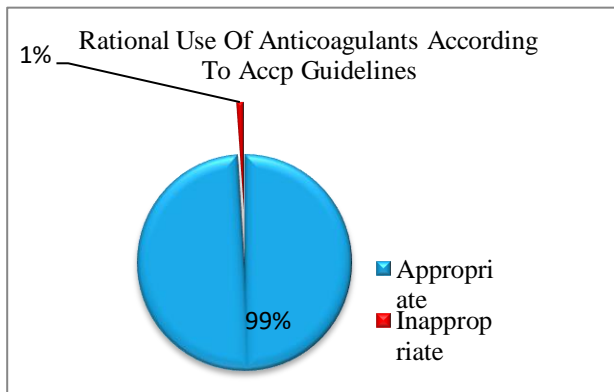


Fig 3:- Pie Chart Representation of Rational Use of Anticoagulants According To ACCP Guidelines

- In our study population, it is observed that only 0.5% were present with GI bleeding.

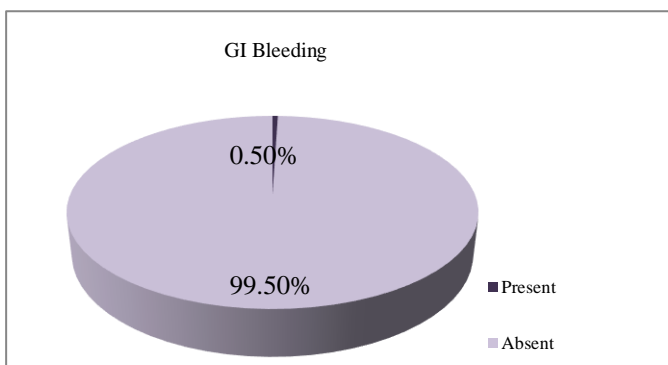


Fig 4:- Pie Chart Representation on Incidence of GI Bleeding In Study Population

- In our study population, 45.5% of patients have spent in the range of 7500-8500 INR per week for Anticoagulants and the mean prescription cost of anticoagulants per week was found to be 6582.3±2368.65.

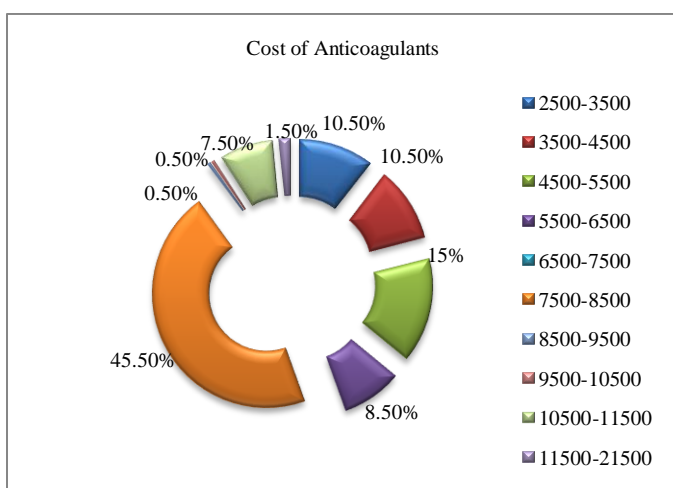


Fig 5:- Pie Chart Representation of Cost of the Anticoagulants per Week in Our Study Population

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