



**TO EVALUATE THE DRUG UTILIZATION PATTERN AND PHARMACOECONOMICS
ON ACUTE CORONARY SYNDROME IN A TERTIARY CARE HOSPITAL**

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ABSTRACT

cross sectional study was carried out among 200 inpatients in a tertiary care hospital Bangalore. Patients diagnosed with ACS from the cardiology department were included in the study. Out of 200 patients with ACS, majority were males (136) and females were (64). The common co-morbidities related to ACS were Diabetes, Hypertension, Dyslipidemia and the majority of the patients were diagnosed with Anterior Wall MI followed by Unstable angina. The most frequently prescribed drugs were (Antiplatelet 45.8%) followed by Antihyperlipidemic (21.7%) followed by Antianginal (17.01%) and Antihypertensive (15.4%). The average number of drugs per prescription was (6.94%). Drugs prescribed by generic name was (4.62%). Antibiotic constituted only (17%) of the total number of encounters. The frequency of the use of the injectable preparation was (52%). The percentage of drug from the essential drug list was (100%). Polypharmacy was observed in our study. The current research provides valuable insights into overall pattern of drugs used in acute coronary syndrome The study encouraged physicians to prescribe more generic drugs to reduce avoidable cost burdens to patients as well as to decrease polypharmacy especially in geriatric patients.

KEYWORDS: ACUTE CORONARY SYNDROME, DRUG UTILIZATION EVALUATION, PHARMACOECONOMICS.

INTRODUCTION

Cardiovascular disease (CVD) is the leading cause of death, accounting for over one-fourth of all deaths. Diabetes mellitus, dyslipidemia, obesity, sedentary lifestyle, valvular heart disease, and smoking were the substantial risk factors in most studies. The American Heart Association has defined good cardiovascular health as a combination of six risk factors that can be improved with lifestyle changes. They are comprised of smoking status, physical activity, weight diet, blood glucose, cholesterol, and blood pressure.^[1] According to the World Health Organization, 17.9 million people died from cardiovascular disease in 2016.^[2]

ACS is classified according to Echo-cardiogram changes into: -

- ST- segment elevation ACS (STEMI).
 - Non-ST-segment elevation MI (NSTEACS).
1. Non-ST-segment elevation MI (NSTEMI).
 2. Unstable Angina.^[4]

Drug utilization evaluation, according to the World Health Organization, is an ongoing systematic, criterion-

based program of medicine evaluation that aids in applicability. DUE improve medication by:

1. Promoting optimal medication therapy
2. Preventing medication-related problems
3. Rational use of drug, management of cardiovascular risk factors.^[8]

In this study, drug utilization is assessed using WHO prescribing indicators, which aid in determining drug rationale. The study also focuses on increasing prescriber awareness and understanding how drugs are used on a specific patient population by examining the prescribing pattern.^[9]

Pharmacoeconomics are often defined as the measurement of each price and consequences of therapeutic decision making. Pharmacoeconomics provides a guide or decision makers on resources allocation. Pharmacoeconomics will assist within the planning process and help assign priorities where, for example, medicines with a worse outcome are also obtainable at a lower price and medicines with outcomes and higher cost can be compared. When economic evaluations are conducted, it's vital to categorize varied

costs. Costs can be direct to the organization, which is physicians' salaries, the acquisition costs of medicines, consumables associated with drug administration, staff time in preparation and administration of medicines, laboratory charges for monitoring effectiveness and adverse drug reactions. Indirect costs embrace lost productivity from a disease which might manifest itself as a cost to the economy or taxation system as well as economic costs to the patient and the patient's family.

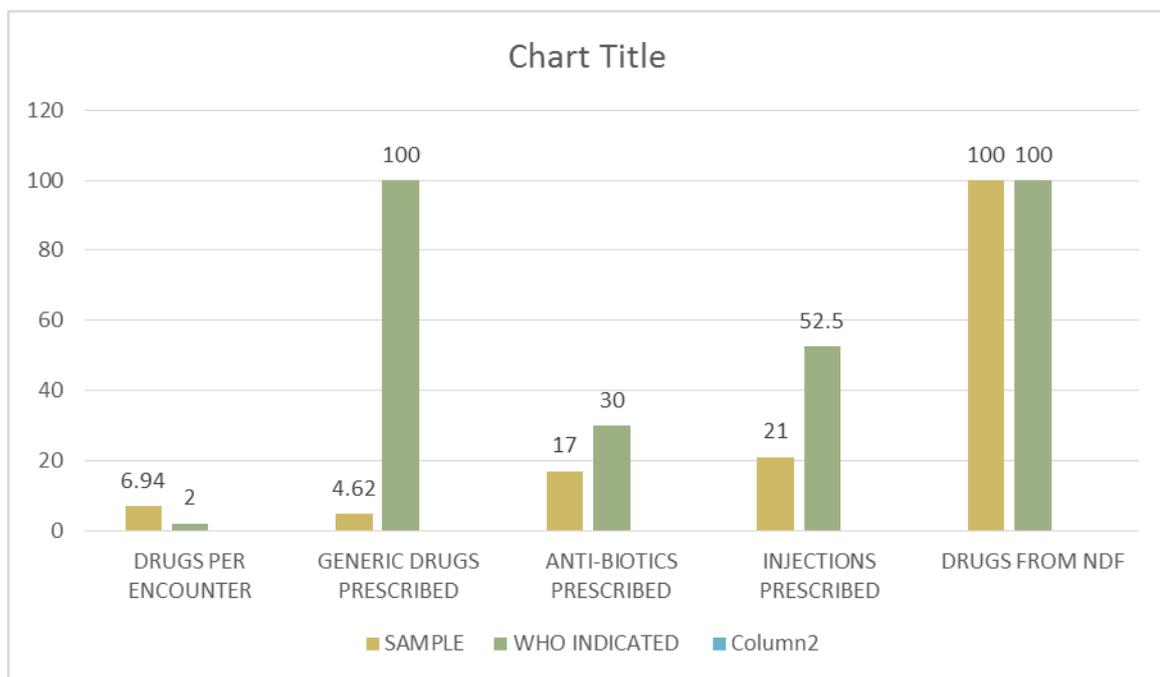
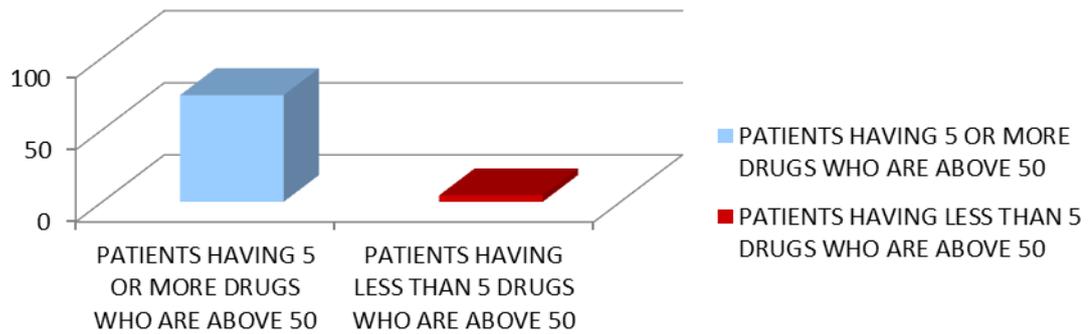
METHODOLOGY

The cross-sectional study was carried out among 200 inpatients in a tertiary care hospital Bangalore. Patients diagnosed with ACS from the cardiology department were included in the study. The data were collected from the patient case profile and prescriptions and noted in a self-designed data collection form. The statistical analysis of the collected data was performed using SPSS software.

RESULTS

Out of 200 patients with ACS, majority were males (136) and females were (64). The common co-morbidities related to ACS were Diabetes, Hypertension, Dyslipidemia and the majority of the patients were diagnosed with Anterior Wall MI followed by Unstable angina. The most frequently prescribed drugs were (Antiplatelet 45.8%) followed by Antihyperlipidemic (21.7%) followed by Antianginal (17.01%) and Antihypertensive (15.4%). The average number of drugs per prescription was (6.94%). Drugs prescribed by generic name was (4.62%). Antibiotic constituted only (17%) of the total number of encounters. The frequency of the use of the injectable preparation was (52%). The percentage of drug from the essential drug list was (100%).

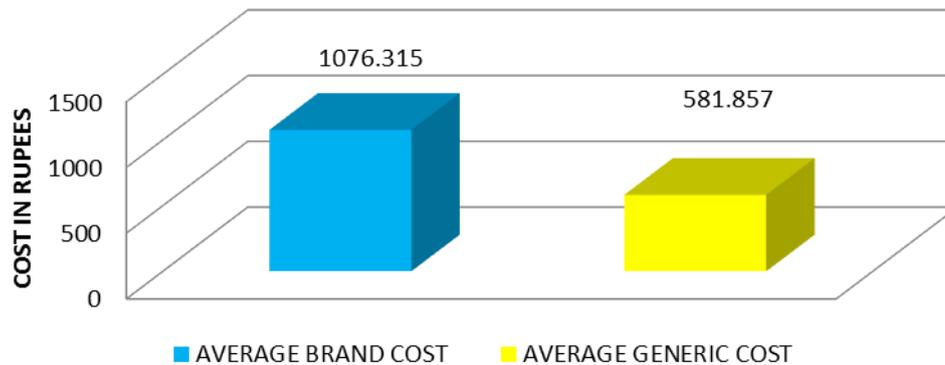
ENUMERATION



The cost of brand and generic drugs are taken to perform a cost minimization analysis. The generic drugs are endorsed with same effectiveness of their respective brand drug counterpart. The total cost of medication for 200 patients while being on brand and generic drugs are

Rs. 215263.046 and Rs. 116371.531 respectively. The average cost for a patient if prescribed with brand drugs are estimated around 1076 rupees but it reduced to 581 rupees when on generic medication.

AVERAGE COST OF DRUGS



DISCUSSION

Among the 200 cases collected for our study, we found that majority were males (68%) and were females (32.5%). Average age group was 50-60 years. The result found to be consistent with the study conducted by Tittu George^[16] *et al.*, indicated that males were more prone to coronary artery disease compared to females and risk increase with increasing age.

Medical data of 200 patients suffering from ACS were collected. Out of 200, 148 patients were above 50 years of age had more than 5 drugs prescribed followed by 9 patients had less than 5 drugs who were above 50 constituting 4.5% this result was found to be similar with the study conducted by Jesso George *et al.*^[34]

In our study, the common co-morbidities related to ACS were hypertension (18.5%) and diabetes (14.5) %. The study found to be similar with study conducted by Saranya *et al.*,^[36] constituting diabetes (29.6%), hypertension (35.2%) and Nagabushan *et al.*,^[37] constituting hypertension(32.4%) diabetes(28.4%) which indicate that hypertension followed by diabetes mellitus were the most common co-morbidities associated with ACS.

Out of 200, 26.5% were diagnosed with anterior wall MI(STEMI) followed by 23.5% with unstable angina, 20% with inferior wall MI, 8.5% with NSTEMI, 6.5% with posterior wall MI, 4% with anterolateral MI. Saranya *et al.*^[36], conducted a study and the common diagnosis were found to be ST-elevation MI (STEMI) including Anterior wall MI (36.8%) and ACS-inferior wall MI (32.8%).

The different classes of drugs prescribed among 200 cases collected were as follows; Antiplatelets 350

(45.8%), Antihypertensive 118 (15.4%), Antihyperlipidemic 166 (21.7%), Antianginal 130 (17.01%). Among antiplatelet, aspirin (165) was the mostly prescribed, and from antihypertensive, telmisartan (37) followed by anti-hyperlipidemic, ator (57), anti-anginal (130), ranoxex (99). But in study conducted by Praveen *et al.*,^[13] and Avula Naveen *et al.*,^[8] the most commonly prescribed drugs were Aspirin followed by Clopidogrel and Atorva.

Our study found out that the proportion of drugs prescribed in generic name was 4.62% which was lower than the study conducted by Vidhi Thaker *et al.*,^[14] which was 10.68% and found to be higher when compared to studies conducted by Vinod prabhu *et al.*,^[19] (2.33%) and Siddaruda Malleshappa *et al.*,^[26] (3.03%). The study showed that the injection counts was 52% which was higher in compared to the previous studies conducted by Saranya *et al.*^[36] which was 28.3% and lower when compared to study done by Cristina Joy^[7] *et al.* 84.04%. The injection prescribed was not in accordance with the WHO standard value.

The percentage encounter with antibiotics were found to be 17% which was high when compared to the study done by Shannumukha^[22] (13.86) and is lower when compared to the study done by Cristina Joy *et al.*^[7] (18.5%). The most common antibiotic prescribed was found to be Ceftriaxone.

The average drug per prescription was 6.4 among the total samples which was comparably lower to Afroz *et al.*^[38] (8.8) and Shannumukha *et al.*^[22] (7.8). This difference could be due to change in the co-morbid conditions and prescribing pattern among physician.

The average number of prescriptions as per WHO was 1.6 to 1.8 but because of the co-morbidities more drugs were prescribed which led to increased drug prescription with highest of 13 drugs in only one prescription and the lowest drug was 1 (1 prescription). The percentage of drugs prescribed in the national formulary was 100 but, in a study, conducted by Pournamy *et al*^[26] the drugs from NLEM were 61%. Patients of older age groups (above 50) are majorly encountering polypharmacy (148 patients).

Average standard mean of brand cost was 1076.31+/-315.18 and generic cost 581.85+/-33.54 this implies that average generic medication cost was economical than brand cost and minimization medication cost of brand drug prescription was higher than generic drug. We can conclude that less economic burden will be placed on the patients if the drugs were prescribed in generic names which has the same efficacy as the branded drugs.

CONCLUSION

The current research provides valuable insights into overall pattern of drugs used in treating acute coronary syndrome. Physician should be encouraged to increase generic prescribing to reduce the medication cost burdens as well as to avoid the unessential which may lead to polypharmacy and may result in other medication related problem.

BIBLIOGRAPHY

1. Ren J, Guo X, LU Z, Zhang J, Tang J, Chen X *et al.* Ideal cardiovascular health status and its association with socioeconomic factors in Chinese adults in Shandong, China. *BMC Public Health*, 2016; 16.
2. WHO-Cardiovascular disease <https://www.who.int/health-topics/cardiovascular-diseases>
3. Mensah G, Roth G, Fuster V. The Global Burden of Cardiovascular Diseases and Risk Factors. *Journal of the American College of Cardiology*, 2019; 74: 2529-2532.
4. Joseph T. Dipiro and Barbara G. Wells, *Textbook of "pharmacotherapy Handbook"*, Cardiovascular disorders, Section 2, page no: 43.
5. Mansoor Ahmed, Parth Mehta, Anil Kumar Reddy Reddivari, Sudhir Mungee percutaneous intervention, *StatPearls Publishing*; 2021 Jan.
6. Bachar BJ, Manna B, coronary artery bypass graft, *Stat Pearls Publishing*; 2021 Jan.
7. Christina Joy, Moushmi Arul Moorthy, Dona Saju, Jithin Antony an Evaluation of Prescribing Pattern of Drugs and drug utilization analysis in patients with Acute coronary syndrome., *Indian Journal of Pharmacy Practice*, vol 13, issue 1, Jan-mar, 2020.
8. Avula Naveen, Dr. MR Sravani, and J Naresh Venkat, Drug utilization journal patterns in acute coronary syndrome at a tertiary care teaching hospital: A retrospective, on interventional and observational study. *The Pharma Innovation Journal*, 2017; 6(9): 538-542.
9. Neenu Babu, Shamna c, Sreelekshmi vs, Philip John Sebastian, Nithin Manohar R, William Arputha Sundar AS, John Wesly A Review on Drug Utilization Trends *Am. J. PharmTech Res.*, 2018; 8(6).
10. Roger Walker and Cate Whittlesea. *Textbook on "Clinical pharmacy and Therapeutics"*, page no: 117 in *Coronary Artery Diseases Am. J. PharmTech Res.*, 2018; 8(6).
11. Tefera Y G, Alemayehu M, Mekonnen G. B, Prevalence and determinants of polypharmacy in cardiovascular patient attending outpatient clinic in Ethiopia university hospital, *PLoS ONE* 15(6).