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PRESCRIPTION PATTERN OF ANTIHYPERLIPIDEMIC AND ANTIPLATELET DRUGS IN THE MANAGEMENT OF CORONARY ARTERY DISEASE IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Aim: To screen the Irrational prescribing practice of antihyperlipidemic and antiplatelet drugs within the administration of coronary course illness and to create Medicine prescribing observing practice. **Objective:** To highlight the medicine hone of antihyperlipidemic and antiplatelet drugs within the administration of coronary course infection of inpatient division, uncommonly medicine of non specific drugs comparing with branded drugs on the basis of collected information within the limit of case sheets from the patients. **Methodology:** This was a prospective hospital based study conducted for 8 months from Nov 2017 to Jun 2018. Convenient enrolment technique was employed in which all patients in cardiac department who were selectively prescribed with antihyperlipidemic and antiplatelet drugs in Prime Hospital from Nov 2017 to Jun 2018 were enrolled. **Result:** The rationality of the prescriptions, we found 77% prescribed drugs as branded and 23% Generic. Out of 150 prescriptions, Distribution of Interaction per Prescription as per Charleson Index 2% of Major Interactions 25% of Moderate Interactions 22% of Minor Interactions were observed.

KEYWORDS: CAD, Antiplatelets, statins, antihyperlipidemic, clots, Dyslipidaemia, irrationalisation of drugs, prescriptions.

INTRODUCTION

Coronary heart disease (CHD) incorporates a complex and multifactorial foundation counting both hereditary and way of life variables, and regularly their intuitive. Characterization of such intelligent will contribute to an expanded understanding of the instruments causing CHD.[1]

Cardiovascular disease counting CHD, cerebrovascular illness or stroke, fringe vascular illness and hypertension, is the driving cause of passing in tall- and middle-income nations. CHD is the foremost common cardiovascular infection, and presents clinically generally as myocardial dead tissue (MI) or as angina pectoris. An MI happens when the blood supply to portion of the myocardium is hindered due to an impediment of a coronary supply route, causing ischemia and irreversible harm to the heart. Angina pectoris happens when there's a decreased blood stream within the coronary supply routes which leads to oxygen exhaustion, ordinarily causing chest torment. Steady angina pectoris shows up amid physical action when the oxygen necessity is expanded, whereas unsteady angina pectoris shows up moreover at rest. [1]

Passing rates from CHD have fallen the final decades in all Western European locales. There's a huge sexual orientation distinction in CHD passing rates, with an age-standardized passing rate in people aged 0-64 within the European Union of 38 per 100 000 in men, and 9 per 100 000 in ladies. In Sweden, rate rates of MI as well as mortality from MI have declined since the 1980s. In 2012, the age-standardized rate of intense MI was 415 per 100 000 Swedish occupants matured 20 and over, with the rate expanding with age and being higher in men than in women. [2]

CHD is additionally related with weight, dyslipidemia, affront resistance (components of the metabolic syndrome) and diabetes. Within the worldwide INTERHEART consider, nine modifiable chance components were found to foresee over 90% of the hazard of MI. These were the apolipoprotein B/apolipoprotein A1 proportion (ApoB/ApoA1), hypertension, diabetes, stomach weight, smoking, physical inertia, a tall hazard eat less (i.e. tall admissions of meat, fricasseed or salty nourishment and moo admissions of natural product and vegetables), liquor admissions and psychosocial components (e.g. stress or depression).

AIM

To screen the Irrational prescribing practice of antihyperlipidemic and antiplatelet drugs within the administration of coronary course illness and to create Medicine prescribing observing practice which serves as an apparatus for evaluating the endorsing, apportioning and dispersion hones of drugs against coronary supply route malady which encourages levelheaded utilize and evaluate the viability in advancing sound utilize of drugs.

OBJECTIVES

To highlight the medicine hone of antihyperlipidemic and antiplatelet drugs within the administration of coronary course infection of inpatient division, uncommonly medicine of non specific drugs comparing with branded drugs on the basis of collected information within the shape of case sheets from the patients.

Our points of interest are

- Age of the patients,
- Number of drugs per prescription,
- Number of drugs prescribed by generic name,
- Diagnosis,
- Number of drugs dispensed per prescription,
- Number of labeled drugs per dispensed drugs,
- Number of patients having correct knowledge of dose,
- Number of patients asking for follow-up
- Number of patients asked for duration of illness, past history or drugs history,
- Number of patients getting dosing instruction,
- Number of patients advised for investigation,
- Knowledge about drug interactions

METHODOLOGY

Prime Hospital is a private teaching hospital and a state referral centre for Hyderabad. Prime Hospital is mostly dedicated to cardiac services and it is positioned to serve patients from different parts of the country and is, in effect, the apex of the private health service hierarchy in Hyderabad. Hyderabad is the capital of the southern Indian state of Telangana and de jure capital of Andhra Pradesh, with approximately 6.7 million and a metropolitan population of about 7.75 million, making it the fourth most populous city and sixth most populous urban agglomeration in India.

Study design

This was a prospective hospital based study conducted for 8 months from Nov 2017 to Jun 2018.

Study population

The study included all patients in cardiology department suffering from coronary artery disease ward who were selectively selected by prescription pattern of antihyperlipidemic and antiplatelet drugs in the management of coronary artery disease during the study period.

Sample size

Sample size was convenient sampling in which all patients who had coronary artery disease and met inclusions criteria were included. Total selective prescriptions of 150 patients were included in the study.

Inclusions and Exclusions criteria

Inclusion criteria

All sampling prescriptions in which all patients who had coronary artery disease consisting of prescribed antihyperlipidemic and antiplatelet drugs by a consultant cardiologist are included. Total selective prescriptions were of 150 patients are included in the study.

Exclusions criteria

All sampling prescriptions in which all patients who doesn't had coronary artery disease are excluded. Patients who are in critical conditions and Patients who are not willing to participate. ***Shruti Dawalji et al., (2014).***

Sampling Technique

Convenient enrolment technique was employed in which all patients in cardiac department who were selectively prescribed with antihyperlipidemic and antiplatelet drugs in Prime Hospital from Nov 2017 to Jun 2018 were enrolled.

Study procedure

Audit of selective prescriptions was done by collecting information on timing of administering first dose of antihyperlipidemic and antiplatelet drugs, demographic data, types of comorbidities, choice of drugs used, from case notes and observation. A Structured pattern was used to collect information.

Data processing and analysis

Data recorded on the data collecting tool was processed and checked for completeness and consistency using MS EXCEL program followed by data cleaning and coding then data analysis using frequency tables and cross tabulation with respective statistical tests. After analysis of the data followed by interpretation, report was written and presented.

RESULTS

Medical condition of CAD

Medical condition inquires about improving our information by how drugs are utilized as,

- It might be used to determine the numbers of patients disclosed to specific drugs within a period.
- It can explain the extent of use at an absolute moment and/or in a satisfied area (e.g. in a country, region, community or hospital).

Table 1: Medical condition.

Medical condition of CAD	
Hypertention	Dyslipidemia
Coronary artery disease	Stroke
Stenosis	Angina
Cardiac myopathy	Rheumatic heart disease
Ischematic heart disease	Arrhythmia
Heart failure	Myocardial infarction

Comorbid Diseases in CAD

In medication, comorbidity depicts the impact of all other infections a person persistent might have other than the essential infection of intrigued.

Table 2: Comorbid Diseases.

Comorbid Diseases in CAD	
Diabetes mellitus	Anemia
Asthma	COPD
Renal disorders	Thyroid disorders
GI disorders	Others

Prescribing Pattern in CAD

Prescription Pattern research allows us to evaluate whether interventions intended to enhance drug use have had the ambition impact.

Table 3: Prescribing Pattern in CAD.

Prescribing Pattern in CAD	
Lipid lowering agents	Antiplatelets
Anticoagulants	Antianginal
ACE Inhibitors	Angiotensin Receptor Blockers
Alpha Adrenergic blockers	Beta Adrenergic blockers
Beta Adrenergic receptor blockers	Alpha Adrenergic receptor blockers
Calcium Channel blockers	Anti Arrhythmia
Anti Heart Faliure	Vasodilators
Diuretics	Antiulcers
Antidiabetics	Others

Demographics in CAD

Table 4: Demographics in CAD.

Sl. no.	Demographics in CAD		
1.	**Age in years**		**Number of patients**
	i.	41 - 50	12
	ii.	51 - 60	75
	iii.	61 - 70	49
	iv.	71- 80	14
2.	**Sex**		
	i.	Male	93
	ii.	Female	57
3.	**Body mass index in Kg/m2**		
	i.	Underweight (<18.5)	5
	ii.	Normal weight (18.5 – 24.9)	26
	iii.	Overweight (25 – 29.9)	119

Demographics in CAD may be used to analyze the observed prototype of drug use for the healing of a certain disease with current guidelines.

Within the present study, out of 150 patients, 62% were male and 38% and 35% were more than 61 years of age and 119 cases were of overweight in Body mass index.

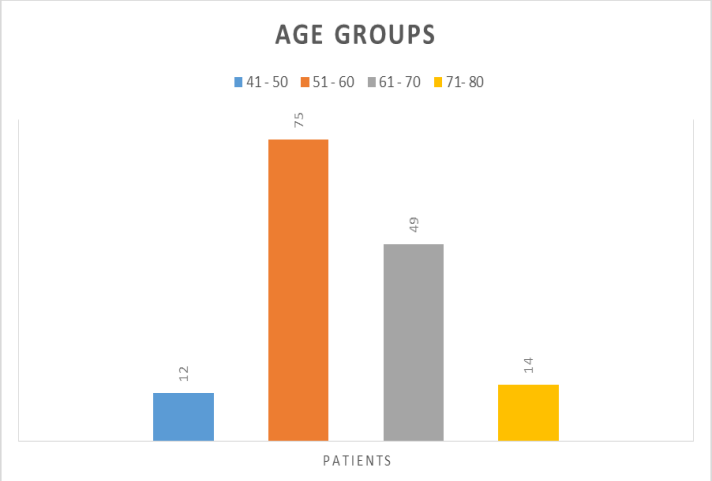

Figure 1: Age Groups in CAD.

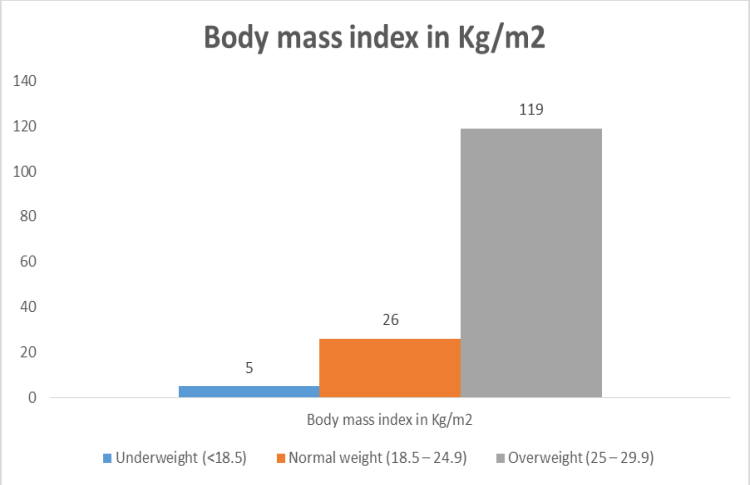

Figure 2: Body mass index in Kg/m2 of CAD.

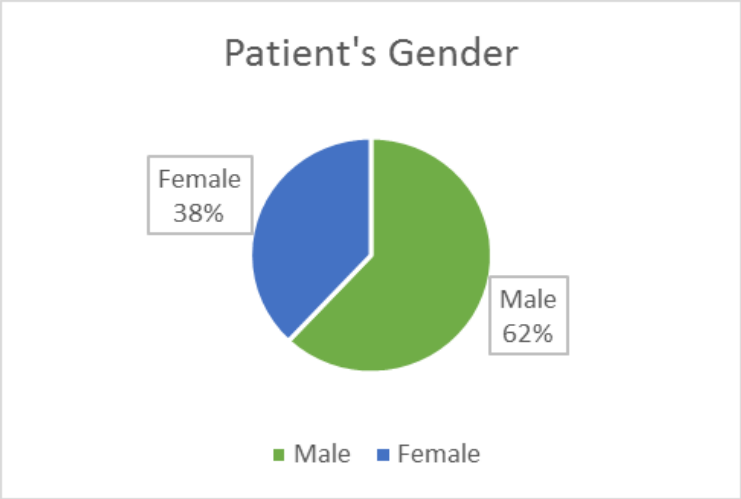

Figure 3: Patient's Gender in CAD.

Prescription Rate in CAD

Prescription Rate in CAD can distinguish the prototype or contour of drug use and the scope to which substitute drugs are used to cure particular conditions. Within the present study, the drug medicine rates of Lipid lowering agents specialists were 36.43%, Anticoagulants 26.68%. The medicine rate of lipid bringing down drugs in this ponder were comparatively exceptionally high than the past study.

Table 5: Prescription Rate in CAD.

S. no	Category of Drugs	No. of Drugs	Prescription rate (%)
1	**Lipid lowering agents**	**36**	
	Rosuvastatin+ Clopidogrel + Aspirin	13	42.46%
	Atorvastatin + Clopidogrel + Aspirin	18	56.00%
	Fenofibrate	5	01.53%
2	**Anti-atherogenics**	**18**	
	Clopidogrel + Aspirin	4	23.49%
	Atorvastatin + Clopidogrel	7	36.61%
	Clopidogrel	3	13.66%
	Aspirin	4	26.22%
3	**Anti-Anginals**	**14**	
	Nitroglycerine + Isosorbide	8	57.53%
	Isosorbide mononitrate and hydralazine	6	42.46%

4	**Anticoagulants**	**23**	
	Rivaroxaban	3	10.92%
	Warfarin	15	64.70%
	Heparin	3	10.50%
	Apixaban	1	06.30%
	Dabigatran	1	07.56%

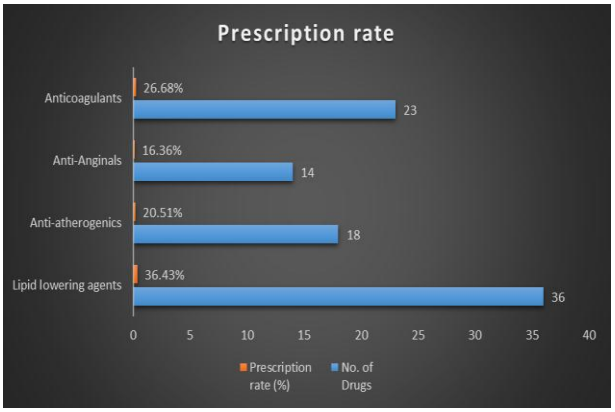

Figure 4: Prescription Rate in CAD.

Comorbid Diseases in CAD

Comorbid Diseases in CAD may be defined as a therapeutic condition existing at the same time but autonomously with another condition in a quiet (typically the more seasoned and more "rectify" definition). Diabetes Mellitus comorbidity was observed with three other diseases which is highest in percentage.

Table 6: Comorbid Diseases.

Comorbid Diseases in CAD	No of Prescriptions	%
Hypertension + Diabetes Mellitus	21	14%
Kidney disease + Diabetes Mellitus	39	26%
Asthma+ Diabetes Mellitus	47	32%
Thyroid disorders+ Diabetes Mellitus	15	10%
COPD	11	7.38%
GIT disorder	7	4.67%
Others	8	5.4%

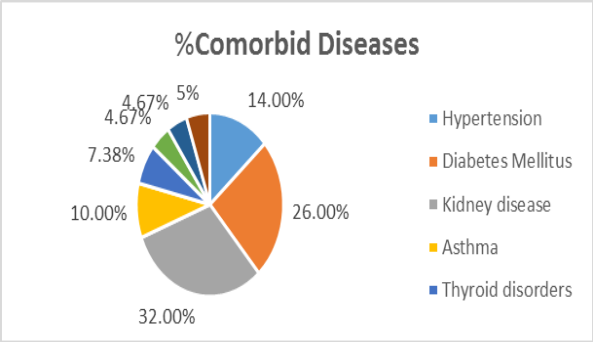

Figure 5: %Comorbid Diseases in CAD.

Table 7: Drugs Prescribed other than antihyperlipidemic and antiplatelet drugs.

Drugs other than antihyperlipidemic and antiplatelet drugs	No of Drugs	Prescription rate (%)
Antidiabetic Drugs		
Regular Insulin	23	15%
Metformin	13	8%
Glibenclamide	5	3%
Glimepiride	9	6%
Antimicrobial agents		
Amoxicillin+Clavulanic acid	27	18%
Ceftriaxone + Levofloxacin	12	8%
Cefotaxime + Sulbactam	16	10%
Ciprofloxacin	10	6%
Metronidazole	6	4%
Antiulcer/ antiemetic agents		
Domperidone	18	12%
Ranitidine	6	4%
Pantoprazole	9	6%
Bronchodilators		
Theophylline + Salbutamol	41	27%
Beclomethasone	4	2 %
Budesonide + Formoterol fumarate	19	12%

Corticosteroids		
Hydrocortisone + Neomycin Sulphate	14	9%
Dexamethasone + Ondansetron	8	5%
Anticonvulsants		
Phenytoin	17	11%
Mannitol + Dibasic Calcium Phosphate	4	2%
Multi Vitamin + Antioxidant + Multi Mineral	3	2%
Anxiolytics		
Clonazepam	5	3%
Diazepam	17	11%

Drugs Prescribed other than antihyperlipidemic and antiplatelet drugs to show a restorative condition in a persistent that causes, is caused by, or is something else related to another condition within the same understanding. In this table Theophylline + Salbutamol was found to be highest in number i.e. 41,(27%).

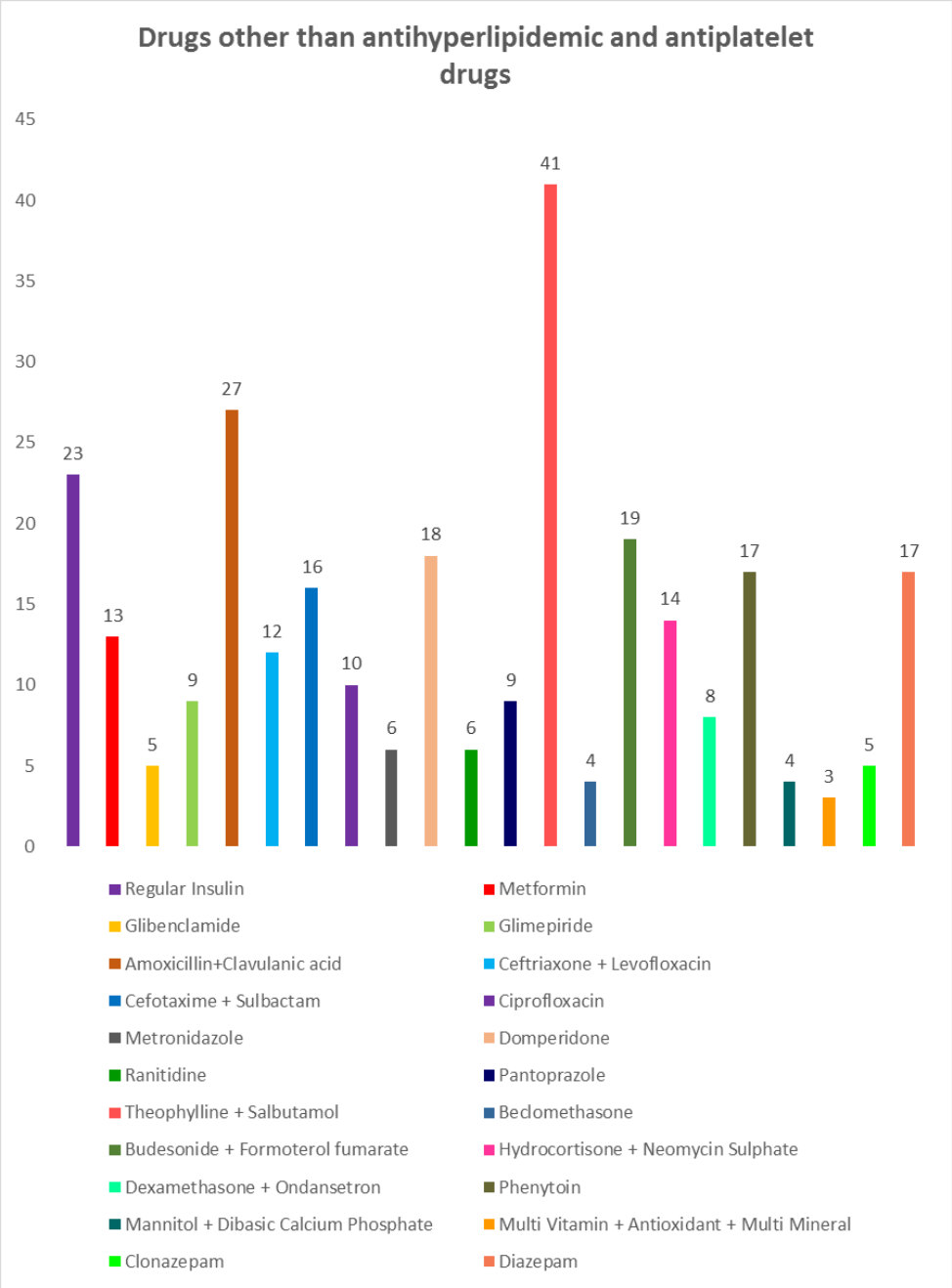

Figure 6: Drugs Prescribed other than antihyperlipidemic and antiplatelet drugs.

Table 8: Social History.

S. no	Social History	N	%
1	Smokers	12	8%
2	Alcoholic	45	30%
3	Both smoking & Alcohol consumption	52	34%
4	None	41	27%

All the social history patients consuming alcohol and smokers are mostly from male demographs.

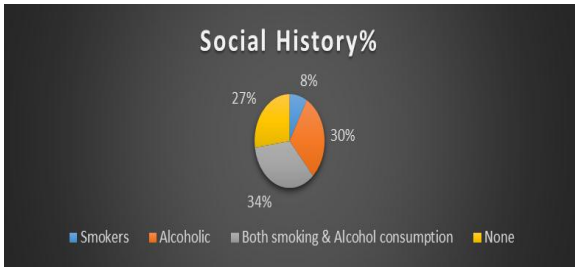

Figure 7: Social History.

Category of drugs in CAD

Table 9: % Category of drugs Prescribed in CAD.

Category of drugs in CAD	% Prescribed
Branded	77%
Generic	23%

Prescribing percentage of generic drugs was 23% and branded drugs was 77%.

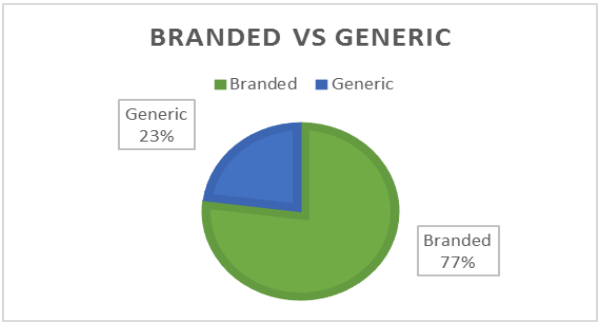

Figure 8: % Category of drugs Prescribed in CAD.

% Generic Drug and % Brand Drug Prescribed

Table 10: %Generic Drug and % Brand Drug Prescribed.

Category	Generic Name	%Generic Drug	Brand Name	% Brand Drug
Antidiabetic Drugs	Regular Insulin	23, 23%	Actrapid	78, 77%
	Metformin	13, 22%	Alphage	46, 78%
	Glibenclamide	5, 23%	D-Con	17, 77%
	Glimepiride	9, 26%	Glimepiride IDPL	25, 74%
Antimicrobial agents	Amoxicillin+Clavulanic acid	27, 25%	Advent Dt	83, 75%
	Ceftriaxone + Levofloxacin	12, 26%	Accuzon	34, 74%
	Cefotaxime + Sulbactam	16, 27%	Taximax	42, 73%
	Ciprofloxacin	10, 22%	Abact	34, 78%
	Metronidazole	6, 30%	Flagyl	14, 70%
Antiulcer/ antiemetic agents	Domperidone	18, 37%	Aglodom	30, 63%
	Ranitidine	6, 30%	Rantac	18, 70%
	Pantoprazole	9, 36%	Pantorite	25, 64%
Bronchodilators	Theophylline + Salbutamol	41, 38%	Betaphil T	65, 62%
	Beclomethasone	4, 33 %	Aerocort Rotacaps	8, 67%
	Budesonide + Formoterol fumarate	19, 37%	Budamate	32, 63%
Corticosteroids	Hydrocortisone + Neomycin Sulphate	14, 44%	Neosporin	18, 56%
	Dexamethasone + Ondansetron	8, 45%	Biodexone	10, 55%
Anticonvulsants	Phenytoin	17, 39%	Dilantin	24, 61%
	Mannitol + Dibasic Calcium Phosphate	4, 29%	Humatrope	10, 71%
	Multi Vitamin + Antioxidant + Multi Mineral	3, 38%	Gutclausy	5, 62%
Anxiolytics	Clonazepam	5, 34%	Anxipar	8, 64%
	Diazepam	17, 45%	Anxol	21, 65%

Drug use supposed to be managed according to a cost effective cycle that offers a systematic framework for continuous low pricing improvement.

Awareness of Specific Drug-Drug Interactions of Frequently Prescribed Drugs

Table 11: Awareness of Specific Drug-Drug Interactions of Frequently Prescribed Drugs.

Type of drug combination	Percent aware of the interaction
Enalapril + Aspirin	4 (2.6%)
Atenolol + Aspirin	3 (2%)
Atenolol + Amlodipine	7 (4%)
Metoprolol + Aspirin	5 (3%)

The information on antagonistic drug responses and drug-drug interactions was encourage exemplified by other respondents who certified that unfavorable responses included ‘‘the undesirable impacts of drug’’ whereas the drug-drug interactions alludes to ‘‘the pharmacological responses that result from the utilization of different drugs’’. In any case, a few respondents named unfavorable medicate responses as “the undesirable impacts that happen since of the concurrent utilize of drugs”.

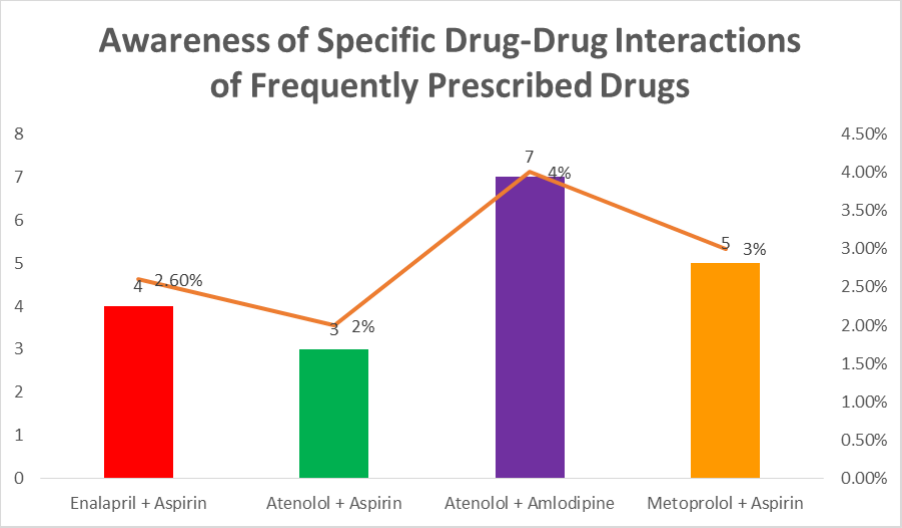

Figure 9: Awareness of Specific Drug-Drug Interactions of Frequently Prescribed Drugs.

Opinion of Regarding Polypharmacy

The normal number of drugs per medicine was more than four demonstrating a high predominance of polypharmacy. In any case, in spite of the truth that wellbeing specialists recognized that polypharmacy leads to negative results, the respondents felt that in a few circumstances polypharmacy might not be dodged, with a few of the witnesses expressing that it could be a “necessary evil” and basic in guaranteeing patients have the “right combination of solutions for their condition” The common reaction from the respondents was that drug-drug interactions are particularly diverse from different from unfavorable responses. A few respondents cited that drug-drug interactions include ‘‘how one medicate influences the other’’ whereas antagonistic responses includes ‘‘the impacts on the patient’’.

Distribution of Interaction per Prescription as per Charlson Index

The Charlson comorbidity list predicts the one-year mortality for a persistent who may have a run of comorbid conditions, such as heart illness.

Table 12: Distribution of Interaction per Prescription as per Charlson Index.

Type of interaction	Number of prescriptions	Percentage
Major	3	4%
Moderate	17	22%
Minor	14	18%
Major and moderate	5	6%
Major and minor	9	12%
Moderate and minor	22	28%
Major, moderate and minor	8	10%
Total	**78**	**100%**

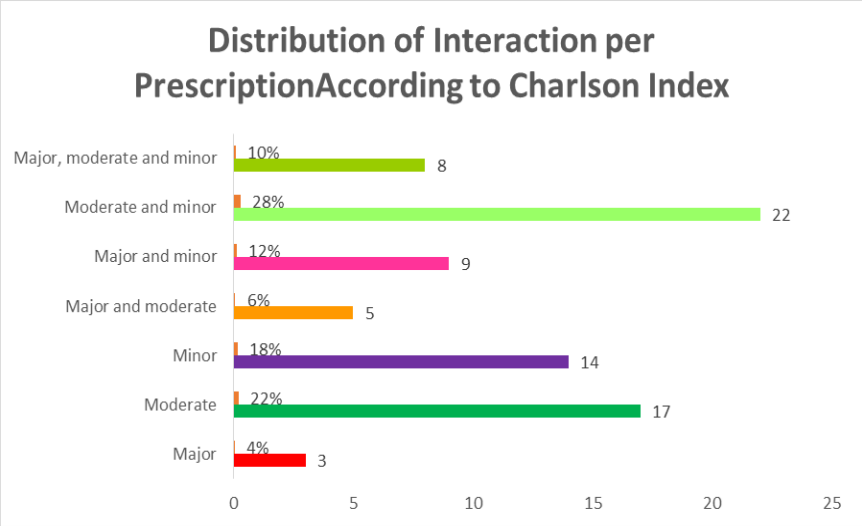

Figure 10: Distribution of Interaction per Prescription as per Charlson Index.

Major Drug-Drug Interactions in Prescriptions of Patients

The major drug interactions observed in our study is given below showing Carvedilol + Aspirin as highest by 25%,

Table 13: List of Major Drug-Drug Interactions in Prescriptions of Patients.

Drugs Interacting	Frequency	%	Mechanism of interaction	Outcome of interaction
Enalapril + Aspirin	12	*9%*	Pharmacodynamic synergism	Increment chance of hypotension, hyperkalemia and renal disability
Atenolol + Aspirin	5	*3%*	Pharmacodynamic additive	Decreased efficacy of atenolol/hyperkalemia
Atenolol + Amlodipine	17	*13%*	Pharmacodynamic additive	Increased Risk Of Hypotension
Metoprolol + Aspirin	13	*10%*	Pharmacodynamic synergism	Decreased Efficacy Of Metoprolol
Carvedilol + Aspirin	32	*25%*	Pharmacodynamic additive	Decreased Efficacy Of Carvedilol
Furosemide + Metoprolol	28	*21%*	Pharmacokinetic metabolism	Affects Serum Potassium Level
Telmisartan + Atorvastatin	21	*16%*	Pharmacodynamic synergism	Increased Risk Of Myopathy

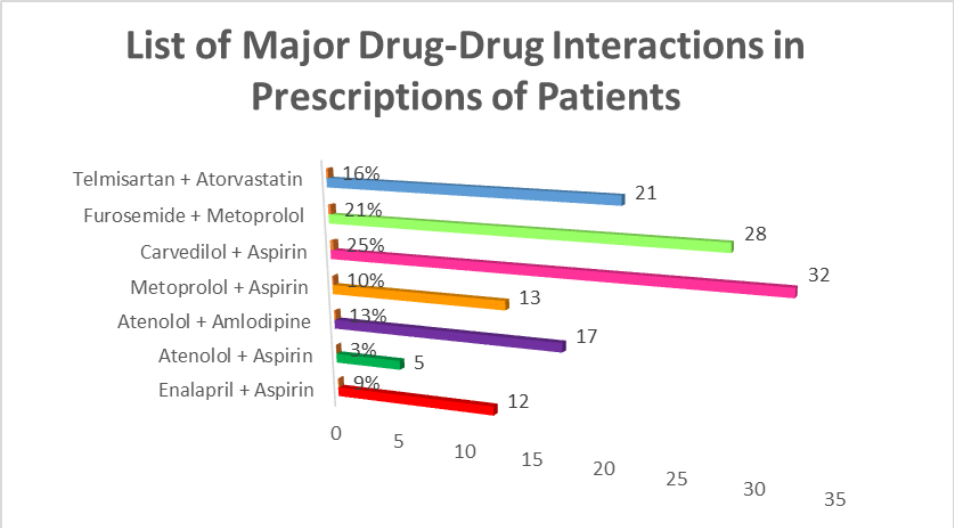

Figure 11: List of Major Drug-Drug Interactions in Prescriptions of Patients.

CONCLUSION

Within the present study, we conclude that out of 150 patients, 62% were male and 38% and 35% were more than 61 years of age. The drug medicine rates of Lipid lowering agents specialists were 36.43%, Anticoagulants 26.68%. The combination of aspirin medicine and clopidogrel were endorsed in more number of patients. Atorvastatin is endorsed in (18) prescriptions and rosuvastatin (13) prescriptions out of 150 prescriptions.

The rationality of the prescriptions, we found 77% prescribed drugs as branded and 23% Generic. Out of 150 prescriptions, Distribution of Interaction per Prescription as per Charlson Index 2% of Major Interactions 25% of Moderate Interactions 22% of Minor Interactions were observed.

Apart from promoting rational pharmaco-therapeutics these measures will also lead to a professional working environment and promote patient care more cost-effective.

Recommendation

For any kind of error of a doctor, the patients suffer badly. There is a requirement for improvement in the standards of prescription patterns. By focussing to improve the quality of care, an action plan should be generated and recommendations for changing the present prescribing practices are set either by providing the hospital doctors with the Standard Treatment Guidelines, by following the information, education, and communication. After an agreed discussion prescribing of drugs should be done to show that the changes that have been performed, results in improvements in drug utilisation.

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