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Original Research Article

Prescription pattern in ischemic heart disease inpatients at B. P. Koirala Institute of Health Sciences: a cross sectional study

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ABSTRACT

Background: Drug utilization pattern studies seek to screen, evaluate and suggest appropriate modifications in prescription practices. It would help to make patient care rational and cost effective. Objective was to analyze the drug prescribing pattern for treatment of ischemic heart disease (IHD).
Methods: A prospective cross-sectional observational study was conducted in patients of IHD admitted in intensive coronary care unit and medicine ward for the period of six months. Data were collected in preformed case record form. The data were analyzed for drug use indicators, demographic parameters, morbidities, pattern of drug use using Microsoft excel 2010.
Results: A total of 145 patients were enrolled out of that 89 (61.38%) were males. The mean age was 60.01±12.71 years and majority (26.89%) belonged to age group of 61-70 years. A total of 1208 drugs were prescribed in 145 patients. Most frequently prescribed drugs were antiplatelet group of drugs 100% encounters, followed by hypolipidemics (98.62%). Average number of drugs per encounter was 8.33 and percentage of drugs prescribed by generic name was 5.04%.
Conclusions: IHD was more common in males than females. The most commonly prescribed drug classes were antiplatelet drugs followed by hypolipidemic agents.

Keywords: Antiplatelet, Drug utilization, Hypolipidemics, IHD

INTRODUCTION

Ischemic heart disease (IHD) is the single largest cause of death worldwide. IHD caused over seven million annual deaths in 2008, 2010 and 2012. It represents 12.7% of total global mortality.[1-3] In the United States alone, IHD is estimated to affect 16.8 million people; of these, 9.8 million have angina pectoris, and nearly 8 million have had a myocardial infarction.[4] However, over the last twenty five years, age-standardized IHD mortality has fallen by more than half in high income countries mainly because of life-style changes, but the trend is flat or increasing in some low and middle income countries.[2] It is estimated that sixty percentage of the world's cardiovascular disease burden will occur in the South Asian subcontinent despite only accounting for twenty percentage of the world's population. This may be secondary to a combination of genetic predisposition and environmental factors.[3] A study showed that forty-two percentage of deaths are caused by non-communicable diseases (NCD) in Nepal among which IHD is the bulk.[5,6] Prevalence of IHD in the Eastern Nepal is 5.77.[7] Similarly, the prevalence of risk of IHD viz., hypertension, diabetes, smoking, alcohol, hypercholesterolemia as well as the hypertriglyceridaemia is also high in the region.[3,8]

Drug utilization pattern has been defined as the marketing, distribution, prescription, and use of drugs in a society with special emphasis on the resultant medical and social consequences.[9] The latest changes in the drug prescribing pattern, increased concern over adverse drug reactions and escalation in the drug pricing have increased the importance of drug utilization studies.[10] A periodic evaluation of drug utilization pattern has become necessary to promote rational drug use by increasing the therapeutic efficacy while decreasing the occurrence of untoward adverse effects. The study of prescribing pattern is a part of the medical audit and it seeks to monitor, evaluate, and if necessary, suggest modifications in prescribing practices to make medical care rational and cost-effective.[11] Inappropriate/irrational drug prescribing is a global problem, particularly in developing and transitional countries.[12] Bad prescribing habits lead to ineffective and unsafe treatment, exacerbation or prolongation of illness, distress and harm to the patient, and higher costs. Irrational prescribing patterns are perpetuated through patient pressure and high-powered salesmanship by drug company representatives.[13] There is paucity of data on drug utilization pattern in IHD in our context. Therefore, the present study was conducted to analyze the drug prescribing pattern for treatment of the ischemic heart disease.

METHODS

A prospective cross-sectional observational study was conducted in patients of IHD admitted in intensive coronary care unit (ICCU) and medicine ward at B. P. Koirala institute of health sciences (BPKIHS), Dharan, Nepal from December 2018 to May 2019. Inpatients with IHD were enrolled. Patients not giving consent and patients diagnosed with other CVS disorders like endocarditis, rheumatic heart disease, arrhythmias, cardiac tumors etc. were excluded. The study considered 19.33% prevalence of use of bronchodilators.[14] Using the formula, $N=z^2pq/d^2$ where z=1.92 at 95% CI, p=19.33%, q=1-p, d=20% and adding 10%, sample size became 455. According to the previous record at BPKIHS, only 200 cases of ischemic heart disease got admitted for treatment. So, formula for finite sample size calculation was used for corrected sample size and the final sample size was calculated as 140. Convenience sampling method was used.

A semi-structured proforma was used to collect the relevant data that consisted of sociodemographic details and drugs prescribed. The principal investigator visited the ward and the study objectives were explained to the patients and then written informed consent was taken. The Cardex was reviewed and the relevant data were directly collected in the proforma. No personal identifying information were collected. The data were entered into Microsoft excel 2010 and descriptive statistics like mean, percentage, frequency and SD were calculated. The findings were presented as graphs and tables.

RESULTS

A total number of 145 patients were enrolled in the study of which 89 (61.38%) were male patients and 56 (38.62%) were female patients. Age-wise distribution of the patients is shown in Figure 1.

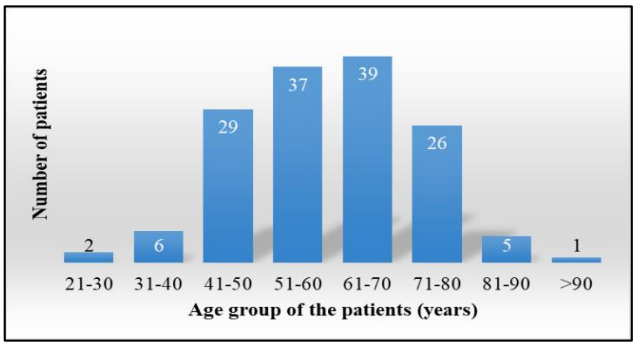

Figure 1: Age wise distribution of the patients, (n=145).

Most of the patients (82.15%) were having ST segment elevation myocardial infarction (STEMI) (Figure 2).

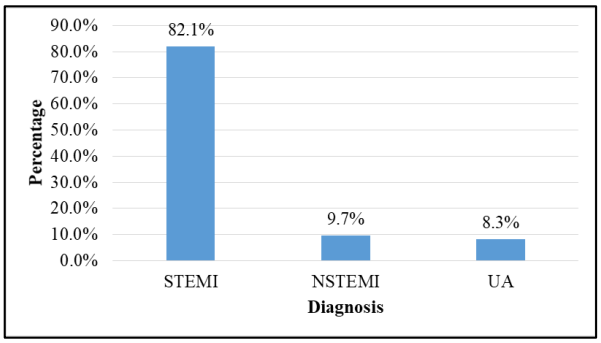

Figure 2: Diagnosis of IHD patients, (n=145).

A total of 1208 drugs were prescribed in 145 patients. Average number of drugs per prescription was 8.33. Only 61 (5.04%) drugs were prescribed by generic names. Figure 3 represents the prescribed therapeutic groups of drugs. Antiplatelets were prescribed in all patients and hypo-lipidemics in 143 (98.62%) patients and antihypertensive in 108 (74.48%) patients (Figure 3).

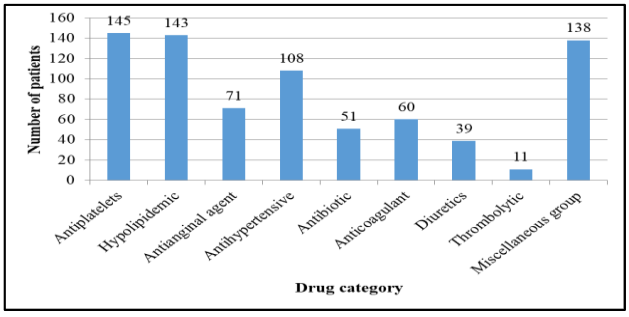

Figure 3: Different categories of drugs prescribed to patients.

List of different anti-thrombotic drugs prescribed in the patients is shown in Figure 4. Antiplatelet drugs were prescribed in 76 (52.41%) followed by antiplatelets + anticoagulants in 58 (40.0%) patients (Figure 4). Aspirin +clopidogrel (141, 97.24%) was the most common prescribed antiplatelets followed by Aspirin (3, 2.07%) and clopidogrel (1, 0.69%).

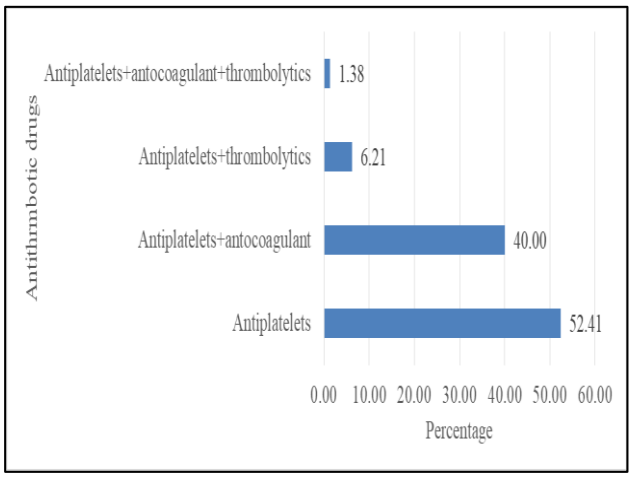

Figure 4: Combination of anti-thrombotic drugs prescribed to the patients.

Out of 60 patients, Enoxaparin sodium (58, 96.67%) was the most common anticoagulant drug followed by Heparin (1, 1.67%) and Nicoumalone (1, 1.67%). Isosorbide Mononitrate + Nicorandil (25, 35.21%) was the most common antianginal drug prescribed followed by Isosorbide mononitrate (23, 32.39%) (Figure 5).

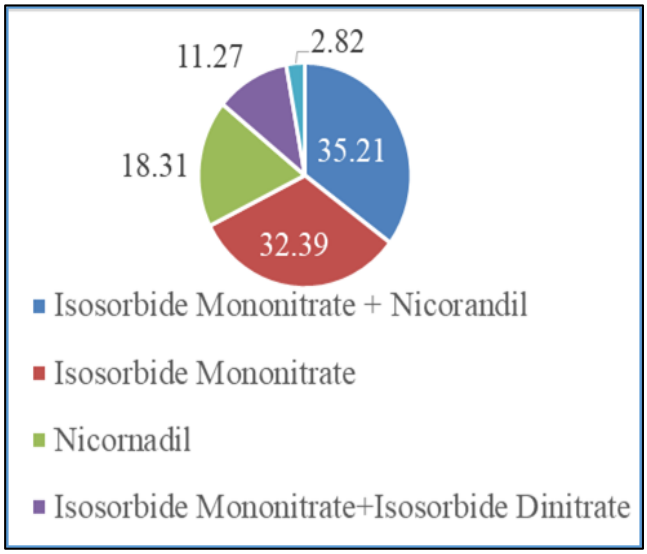

Figure 5: Details of anti-anginal drugs prescribed to the patients.

Table 1 shows the hypolipidemic, antihypertensive and diuretics prescribed to the patients. Atorvastatin (86.71%) was the most common hypolipidemic drug. Beta blockers (66.67%) were the most common anti-hypertensive drug.

Table 1: List of hypolipidemic, antihypertensive and diuretics prescribed to the patients.

Therapeutic group	Individual drugs	N	Percentage (%)
Hypo-lipidemic drugs, (n=143)	Atorvastatin	124	86.71
	Simvastatin	11	7.69
	Rosuvastatin	7	4.90
	Rovastatin	1	0.70
Anti-hyper-tensive drugs, (n=108)	Beta blockers	72	66.67
	Angiotensin converting enzyme inhibitor	66	61.11
	Angiotensin receptor blocker	29	26.85
	Calcium channel blocker	8	7.41
	Alpha + beta blocker	6	5.56
Diuretics, (n=39)	Spironolactone	29	74.36
	Torsemide	12	30.77
	Furosemide	9	23.08
	Hydro-chlorothiazide	1	2.56

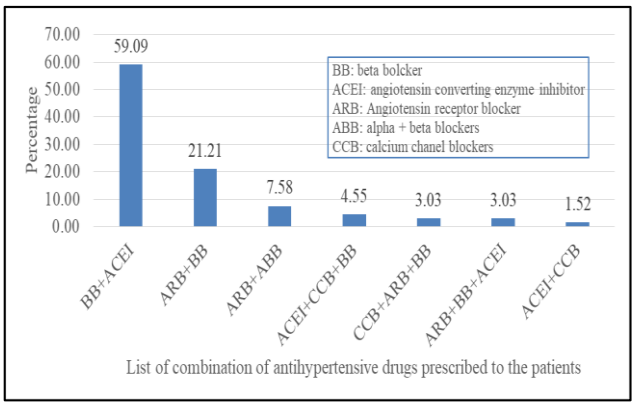

Figure 6: Details of combination of anti-hypertensive drugs prescribed to the patients.

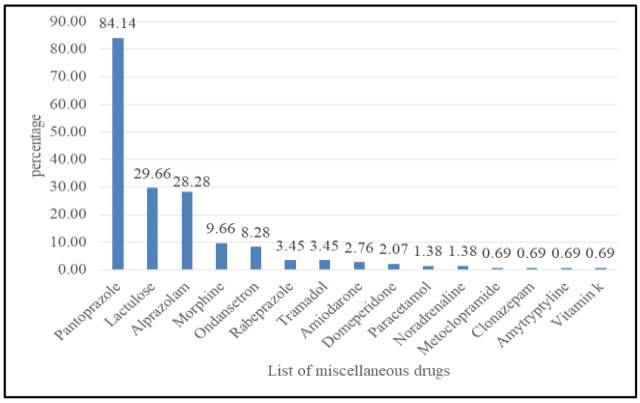

Figure 7: Details of miscellaneous drugs prescribed to the patients.

Combination of beta blockers and angiotensin converting enzyme inhibitors (59.09%) were the most common prescribed combination drug followed by angiotensin receptor blockers with the beta blockers (21.21%) (Figure 6).

Prescription pattern of miscellaneous drugs is shown in Figure 7. Pantoprazole, Lactulose and Alprazolam were prescribed in 122 (84.14%), 43 (29.66%) and 41 (28.28%) patients respectively (Figure 7).

DISCUSSION

In present study, majority of the patients were male and most common age group was 61-70 years which was comparable to the other reports.[15-17] These findings indicated that male was more prone to coronary artery disease compared to female and the risk increased with increasing age. This might be due the fact that risk factors for IHD such as hypercholesterolemia, hypertension, and diabetes mellitus increase with age.[18]

In our study, anti-thrombotic agents were prescribed in all patients, beta-blockers in two-thirds patients, ACE-inhibitors/angiotensin receptor blockers in 61.11% and lipid lowering drugs in 98.62% and these findings were comparable to the study by Dawalji et al in which anti-thrombotic agents were prescribed in 99.41% patients, beta-blockers in 59.41%, ACE-inhibitors/angiotensin receptor blockers in 52.35% and lipid lowering drugs in 95.29%.[17]

It was interesting to find that combination of aspirin and clopidogrel (97.24%) was more than aspirin alone (2.07%) in our study. This finding was in line with Tasneem et al in which the drug utilization of aspirin alone was 25.71% and aspirin and clopidogrel was 60.00%.[16] Similarly, in another study by Dawalji et al the prescription rate of Aspirin alone was 5.88% and combination of aspirin and clopidogrel was 91.76%.[17] Using clopidogrel plus aspirin significantly reduced the risk of the first primary composite end point of nonfatal MI, stroke, and cardiovascular death compared with aspirin alone.[19] In present study, beta-blockers (66.67%) were found to be the preferable choice of antihypertensive prescribed more frequently followed by ACEIs (61.11%) and ARB (26.85%) which was similar to Dawalji et al (59.41%) and Jorg et al (58%).[17,20] In contrast to this, calcium channel blockers were the most common used antihypertensive drugs in studies by Datta et al (73%).[21] Beta blockers are a class of drugs, which are used primarily in hypertension. Antihypertensive and cardioprotective effects of β-blockers support more frequent use as found in our study.[22] In a previous study by Everly et al reported that beta blockers decrease the mortality rate in myocardial infarction patient.[23]

We found that hypolipidemic drugs were prescribed in 98.62% patients and the most frequently prescribed hypolipidemic drug was atorvastatin (86.71%) and this finding was similar to other studies.[16,17] Atorvastatin remains the most commonly prescribed drug among the various statins available to reduce cholesterol levels. The use of diuretics (26.9%) in our study varied slightly from the previous studies conducted by Datta et al (41%) and Dawalji et al (62.35%).[17,21]

In our study the average number of drugs per patient was 8.33 and was lower than that of Tasneem et al (9.93) and Dawalji et al (9.68).[16,17] In contrast to this, the average number of drugs per prescription was found to be 5.5 in a study by Sreedevi et al.[24] The high average number of drug prescription denotes a high degree of polypharmacy in our study. The reason of this finding might be attributed to the increased prevalence of NCD like diabetes, hypertension and dyslipidemia which are often coexistent in IHD patients.[25]

The percentage of drugs prescribed by generic names was 5.04% which was higher than Dawalji et al (2.33%) and lower than Tasneem et al (6.0%).[16,17] Repeated and persuasive promotion of the propriety products by pharmaceutical companies might be an important factor for the low percentage of generic prescribing. The healthcare professionals are compelled to concede to the insistence of affluent patients demanding innovator drugs for therapy.[26] The bioavailability differences between generic and brand drugs could adversely affect the therapeutic outcomes and hence it may be also another reason for prescribing by brand names only.[27] The present study had some limitations. The sample size was small. As the study was conducted at a single center, the findings could not be generalized.

CONCLUSION

IHD was more common in males. The most commonly prescribed drug classes in IHD were anti-platelet drugs followed by hypolipidemics, anti-hypertensives, anti-anginal drugs and anticoagulants. Very few drugs were prescribed by generic name. Prescribing generic drugs might reduce the economic burden of the patients.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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