

# Prescribing Patterns Of Drugs Among Patients Admitted With Cardiovascular Disorders In The Internal Medicine Ward.: Prescribing Patterns In Inpatients

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## Abstract

**Objective:** A survey of prescribing patterns was undertaken among inpatients admitted with cardiovascular disorders in the Internal Medicine ward. **Methods:** The patient diagnosis, duration of hospitalisation, the drugs prescribed, strength, frequency, duration of prescription and the cost per prescription were analysed. The study sample included 129 patients. An attempt was made to relate prescription data to the age and the sex of the patients.

**Results:** Mean  $\pm$  SD drugs per prescription was  $3.39 \pm 1.88$ . 63.57% of the drugs were prescribed by brand names. 45% of the drugs prescribed were from the WHO list of essential drugs. Mean  $\pm$  SD cost of drugs per patient was  $7.66 \pm 4.42$  US dollars. The frequency of prescribing of amlodipine, enalapril, aspirin, frusemide and ranitidine was 34.88% (n=45), 28.68% (n=37), 27.91% (n=36), 17.83% (n=23) and 13.18% (n=17) respectively. The prescribing frequency of frusemide was higher in males and that of ditide was higher in females (<0.05). The prescribing frequency of benzathine penicillin declined with age. The prescription of amlodipine, enalapril, low-dose aspirin and frusemide increased with increasing age.

**Conclusion:** This study reveals a lot of scope for prescriber education to improve prescribing patterns.

## INTRODUCTION

The quality of life in developing countries can be improved by enhancing the standards of medical treatment at all levels of the health care delivery system. Medical audit oversees the observance of these standards.<sup>1</sup>

Rational drug prescribing is defined as the use of the least number of drugs to obtain the best possible effect in the shortest period and at a reasonable cost.<sup>2</sup> Measurement of drug use in health facilities not only describes drug use patterns and the behavior of prescribers but also helps in the identification of polypharmacy and the problems associated with it.<sup>3</sup> Polypharmacy is a major problem with cardiovascular inpatients admitted for a prolonged period of time. Cardiovascular diseases are associated with a variety of other co-morbid conditions, in particular, diabetes mellitus.

The present study was aimed at identifying the patient parameters, the associated co-morbid conditions and the pattern of drug prescribing among inpatients admitted in the medical wards of a teaching hospital in western Nepal. The short- term study was carried out during the months of July and August 2001 at the Manipal teaching hospital, Pokhara, western Nepal.

## MATERIALS AND METHODS

A specially designed form was used to record the required information from the discharge summary of inpatient records of patients admitted with cardiovascular disorders. The following patient parameters were recorded: name, age, sex, diagnosis, co-morbid conditions and duration of hospitalization. The drug parameters noted were: name of the drug, strength, frequency and duration of administration. The cost of the drugs administered to each patient was

calculated using a price list of individual drugs obtained from the hospital pharmacy. The number of drugs received by the individual patients during their hospital stay and whether the prescribing was done using generic names or brand names of drugs were also noted.

The percentage of drugs which were from the national list of essential drugs, Nepal was noted.<sup>4</sup> Males and females were separately divided into six age groups. The frequency of prescribing was calculated for each sex and each age category. The prescribing frequency was expressed as a percentage of the number of times a drug was prescribed in a particular age/sex category to the total number of patients in the chosen age/sex category. The percentage of drugs prescribed from the WHO list of essential drugs was also noted.<sup>5</sup>

The diagnoses of the admitted patients were also studied. For the age-wise analysis of the diagnoses only the cardiovascular diagnoses were taken into account.

## RESULTS

The patterns of drug use in 129 patients admitted to the Internal Medicine wards and suffering from cardiovascular disorders were studied. 62 male patients (48.06%) were admitted in the Internal Medicine wards during the study period while 67 female patients (51.94%) were admitted during the corresponding time period. The majority of the patients were hospitalized for a time period below 6 days (n=72). 42 patients (32.56%) were hospitalized for a time period ranging from 6 to 10 days. The average duration of hospitalization was  $6.41 \pm 3.35$  days (mean  $\pm$  SD).

The number of drugs per prescription is shown in Table 1. The average number of drugs per prescription was  $3.39 \pm 1.88$ . Out of the total of 431 drugs prescribed to the inpatients, 274 drugs (63.57%) were prescribed by brand names. It was observed that the inclination to brand name prescribing was more and there were occasions when prescribing by generic names would have reduced the cost of treatment.

**Figure 1**

Table 1: Incidence of polypharmacy

No. of drugs received during hospital stay	No. of prescriptions	Percentage
0	2	1.55
1	18	13.95
2	28	21.7
3	25	19.38
4	25	19.38
5	13	10.1
6	12	9.3
Above 6	6	4.65
Total	129	100

260 out of the total of 431 drugs prescribed were from the essential drug list of Nepal.<sup>4</sup> Amlodipine, one of the most frequently prescribed antihypertensive drugs in the hospital was not on the Nepal essential drug list. Only 194 (45%) of the 431 drugs prescribed were from the WHO essential drug list.<sup>5</sup> 34 drugs (7.89%) were injectable preparations.

Table 2 shows the prescribing frequency by sex of the eight most commonly prescribed drugs to cardiovascular inpatients in the Internal Medicine wards. The most commonly prescribed drug was amlodipine, a calcium channel blocker followed by enalapril, an ACE inhibitor.

**Figure 2**

Table 2 : Prescribing frequency of chosen drugs

Name of the drug	No. of patients (% of population)	
	Male n=62	Female n=67
Amlodipine	22(35.48)	23(34.33)
Enalapril	20(32.26)	17(25.37)
Aspirin	18(29)	18(26.86)
Furosemide	18(29)*	5(7.46)
Ranitidine	10(16.13)	7(10.45)
Atenolol	9(14.52)	3(4.48)
Digoxin	8(12.9)	14(20.89)
Diltide	3(4.84)	13(19.4)**

\*  $\chi^2 = 10.2$   $p < 0.05$ , \*\*  $\chi^2 = 6.27$   $p < 0.05$

The most common cardiovascular disease condition among the patients was hypertension (n=52). The other common conditions were rheumatic heart disease, cerebrovascular accidents, valvular heart disease and congestive cardiac failure. Valvular and rheumatic heart diseases were more common in the age group below 35 years while hypertension and cerebrovascular accidents were more common in the older age groups.

The commonest co-morbid condition seen in this group of patients was chronic obstructive pulmonary disease (COPD) seen in 10.85% of the patients closely followed by type 2 diabetes mellitus seen in 9.3% of patients. The average cost

of drugs per patient was  $588.19 \pm 368.63$  Nepalese rupees ( $7.66 \pm 4.42$  US dollars).

Table 3 shows the analysis of the prescribing frequency versus age. The prescription of benzathine penicillin declined with age in keeping with the trend of increased prevalence of rheumatic and valvular heart diseases in the younger age groups. The prescription frequency of the antihypertensives, amlodipine and enalapril and of the antiplatelet drug, aspirin increased with increasing age. The prescription of furosemide was also higher in the older age groups while no clear trends were seen for the other medications.

### Figure 3

Table 3: Age-wise prescribing frequency of selected drugs

Name of drug	No. of prescriptions (% of population)					
	14-25 n=42	26-35 n=25	36-45 n=37	46-55 n=72	56-65 n=33	Above 65 n=34
Benzathine penicillin	7(16.7)	2(8)	1(2.7)	0	0	0
Digoxin	6(14.3)	3(12)	7(18.9)	2(2.8)	2(6.1)	7(20.6)
Enalapril	5(11.9)	3(12)	2(5.4)	6(8.3)	10(30.3)	13(38.2)
Diltide	4(9.5)	3(12)	2(5.4)	0	3(9.1)	3(8.8)
Amlodipine	0	4(16)	4(10.8)	7(9.7)	17(51.5)	13(38.2)
Atenolol	0	4(16)	0	2(2.77)	3(9.1)	3(8.82)
Furosemide	2(4.8)	1(4)	5(13.5)	4(5.5)	5(15.1)	6(17.6)
Aspirin	0	1(4)	3(8.1)	3(4.2)	14(42.4)	14(41.2)
Warfarin	1(2.4)	0	2(5.4)	4(5.5)	0	0

## DISCUSSION

Many new potent, effective and expensive drugs have been introduced in the recent decade which has led to a steady increase and often misuse of drugs. Other important reasons for the prescribing explosion are that:

In our study the prescribing prevalence has been expressed as the total number of prescriptions for a particular drug/drug category and also as the prescribing frequency. Prescribing prevalence studies are helpful to determine the prevailing morbidity patterns.<sup>14</sup> In our study, the high prescribing frequency of the antihypertensives, amlodipine and enalapril and of the antiplatelet drug, low dose aspirin reflects the high prevalence of hypertension and cerebrovascular diseases among the study population.

The average duration of hospitalization was 6.41 days and the average cost of drugs prescribed to patients with cardiovascular disease was 588.19 Nepalese rupees (7.66 US dollars) which is fairly high for a poor country like Nepal. Amlodipine, enalapril and low dose aspirin, the commonly prescribed drugs were fairly cheap. However, the frequency of prescribing and the long duration of hospitalization added to the cost of treatment. The prescribing frequency of ranitidine (13.18%) was high and this reflects the high

incidence of acid peptic disorders in the study population.

63.57% of the drugs were prescribed by brand name. 60.33% of the drugs were prescribed from the essential drug list of Nepal and only 45% from the WHO list of essential drugs. This is a matter of concern, however, a large number of drugs which are commonly used for cardiovascular disorders are not represented in either the WHO or the Nepal essential drug list and revision of the drug lists should be taken up as a matter of priority.

In our study 34.88% of patients received a calcium channel blocker, 28.68% received an ACE inhibitor, 30.23% received diuretics and only 12.3% received a  $\beta$  blocker. The use of  $\beta$  blockers was low compared to previous studies while the use of the other drugs was roughly corresponding to that reported from previous studies.<sup>15,16</sup> The prescribing pattern of cardiovascular drugs varied between different countries in a previous study.<sup>17</sup>

The frequency of use of injectable preparations in our study was 7.89%. With the expenditure on disposable syringes and needles adding to the costs of drug treatment and the increase in rate of HIV positive cases, this is becoming all the more important. The rate is much lower when compared to the rate reported from a study in eastern Nepal<sup>18</sup> where 48.9% of the patients received injectable preparations.

One of the limitations of the study could be the wide range of cardiovascular disorders covered. Despite the limitations, the information gathered in this study should be a pointer to the trends in prescribing patterns. The present study could serve as a framework for further studies to investigate the scope for educational intervention in improving prescribing practices.

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