

Prescribing patterns in the orthopaedics outpatient department in a teaching hospital in Pokhara, western Nepal

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Abstract

Objectives: Information on the utilization patterns of drugs in the orthopaedics outpatient department (OPD) are lacking in hospitals in western Nepal. The present study was carried out to obtain demographic information about the respondents selected for analysis, information on the average number of drugs prescribed and the average cost of drugs per prescription. The prescriptions were critically analyzed using predetermined criteria.

Methods: The study was carried out over a four-month period (01.09.2002 to 31.12.2002) at the Manipal Teaching hospital, Pokhara, Nepal. The percentage of encounters with an injection or an antibiotic prescribed was noted. The percentage of drugs prescribed from the Essential drug list of Nepal and the mean cost of drugs per prescription was calculated.

Results: 1238 patients attended the orthopaedics OPD during the study period. 186 prescriptions were randomly selected for analysis. The mean number of drugs per prescription was 1.9. Low backache was the most common reason for attending the OPD. Nonsteroidal anti-inflammatory drugs (NSAIDs) were the most commonly prescribed drug group. Diclofenac and meloxicam were the most commonly prescribed drugs. Mean \pm SD cost of drugs was 166.2 Nepalese rupees. Injections and antibiotics were prescribed in 16 (8.6%) and 7 (3.8%) encounters respectively. 51 prescriptions (27.4%) had various problems. Absence of diagnosis on the prescriptions and the duration of treatment were most commonly observed.

Conclusions: Percentage of prescribing by generic name was low. Educational sessions for the doctors at different levels to encourage prescribing by generic names and on correct writing of prescriptions are required. Studies covering a larger number of patients and for a longer time period are required. A greater number of patients can be studied, seasonal variations can be overcome and drug utilization can be measured quantitatively.

Key words: Drug use patterns, Drug utilization studies, NSAIDs, Prescription audit, Tertiary care hospital

Periodic evaluation of drug utilization patterns need to be done to enable suitable modifications in prescription of drugs to increase the therapeutic benefit and decrease the adverse effects. The study of prescribing patterns seeks to monitor, evaluate and if necessary, suggest modifications in the prescribing behaviour of medical practitioners to make medical care rational and cost effective.¹

Rational drug prescribing can be defined as appropriate drugs prescribed in the right dose, at correct time intervals and for a sufficient duration. Irrational drug use is a common problem in many countries of the world.² The assessment of drug utilization is important for clinical, economic and educational purposes.³ Drug utilization studies aim to provide feedback to the prescriber and to create awareness among them about rational use of medicines.⁴

Previous studies have shown that analgesics, including nonsteroidal anti-inflammatory drugs

(NSAIDs) are a commonly prescribed group of drugs.^{5,6} Studies have shown that use of NSAIDs increases the risk of hospitalization and death from gastrointestinal bleeding and perforation.^{7,8} A study in eastern Nepal focusing on NSAID utilization in orthopaedics had shown that the mean number of NSAIDs prescribed per patient in the orthopaedics department was 1.33.⁹

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Studies on the utilization of drugs in the orthopaedics outpatient department (OPD) are lacking in hospitals in western Nepal. Such studies are necessary to obtain baseline data on drug use and create a database for comparison with future studies. Hence the present study was carried out. The objectives of the study were to:

1. Obtain information on demographic characteristics of the patients selected for analysis
2. Collect information on the diagnosis, number of drugs prescribed and their prescribing patterns and calculate the mean \pm SD number of drugs per prescription
3. Calculate the percentage of drugs prescribed from the Essential drug list of Nepal, 10 percentage of fixed dose combinations (FDCs) and the percentage of drugs prescribed by generic name, percentage of encounters where antibiotics were prescribed
4. Calculate cost of drugs per prescription and
5. Analyze the prescriptions for completeness of information like the presence of OPD number, name, age and sex of patient, diagnosis, name, dose and duration of prescribed drugs.

Materials and methods

The study was carried out over a four-month period from 1st September 2002 to 31st December 2002 at the Manipal Teaching hospital, a tertiary care hospital attached to the Manipal College of Medical Sciences, Pokhara. One thousand two hundred and thirty-eight patients attended the orthopaedics OPD during the study period. One hundred and eighty-six OPD prescriptions were randomly selected for analysis.

A four month period was chosen for the study. The method of duplicate prescriptions was used. We noted the prescriptions of patients attending the orthopaedics OPD at an interval of five days (i.e. on every sixth day). The days when the OPD was not functioning due to holidays were excluded and the next working day was taken. The number of new patients who attended the orthopaedics OPD was 186. Surgical follow up cases and follow up visits of patients attending the OPD with the same complaints with which they had previously come to the OPD during the study period were not included.

The age and sex of the patients were recorded. The drugs prescribed to the patients, their strength, frequency and duration were noted. The diagnosis was noted. The mean \pm SD number of drugs per prescription was calculated. The frequency of prescribing of various drug categories and of

individual drugs was recorded. The median duration of prescription was determined. The percentage of drugs prescribed from the Essential drug list of Nepal was determined.¹⁰ The percentage of drugs prescribed by generic names was calculated. The percentage of FDCs prescribed was determined.

The cost of the prescribed course of individual drugs was determined using the price list supplied by the hospital pharmacy. The mean \pm SD cost of drugs per prescription was noted. The prescribing patterns of NSAIDs (the conditions for which NSAIDs were prescribed, their dose, frequency, duration and route of administration) were determined. The route of administration, duration of prescribing, number of NSAIDs per prescription, percentage of FDCs and of sustained release preparations was calculated.

The percentage of encounters where an injection and an antibiotic was prescribed was calculated. The prescriptions were evaluated for the presence of the following parameters: OPD number, date, name, age and sex of the patient, department, diagnosis, drug name, strength of drug, frequency and duration of prescribing, route of administration and name and signature of the prescribing doctor. Absence of any one of these parameters was taken as indicative of a problem prescription.

Results

One hundred and eighty-six prescriptions were randomly selected (as detailed in the Methods section) of the 1238 patients attending the orthopaedics OPD. The age distribution of the patients is shown in Figure 1. Eighty-six patients (46.2%) were male, 92 (49.5%) were female while the sex was not mentioned in 8 prescriptions. Low back ache was the most common reason for attending the orthopaedics OPD [31 cases (16.7%)]. The other common diagnoses were spondylosis [14 cases (7.5%)], fractures [8 cases (4.3%)] and sprain [6 cases (3.2%)].

The median duration for prescription was 7 days. A total of 352 drugs were prescribed to the 186 patients attending the OPD. The mean \pm SD number of drugs per prescription was 1.9 ± 0.8 . Drugs were prescribed by generic name in 19.3% of cases.

The most commonly prescribed categories of drugs are shown in Table 1. NSAIDs were the most commonly prescribed category followed by multivitamin and mineral preparations and anti-ulcer drugs. The anti-ulcer drugs in all instances were prescribed to reduce or prevent the gastrointestinal irritation caused by NSAIDs. This was arrived at by

analysis of the prescriptions and discussion with the consultants of the department of orthopaedics. The most commonly prescribed individual drugs are shown in Table 2. Diclofenac sodium and meloxicam were the most commonly prescribed drugs.

The mean \pm SD cost of drugs per patient was 166.2 \pm 32.5 Nepalese rupees. NSAIDs contributed to 78.1% of the total drug cost. Glucosamine sulfate contributed to 12.8% of the total drug cost. Details of the use patterns of NSAIDs are shown in Table 3. Two or more NSAID preparations were prescribed concurrently in 42 instances.

Injections were prescribed in 16 encounters (8.6%) while an antibiotic was prescribed in 7 encounters (3.8%). 45.2% of drugs were prescribed from the Essential drug list of Nepal while 13.1% of the drugs prescribed were fixed dose combinations.

The details of the analysis of prescriptions are shown in Table 4. The most commonly observed problem was the absence of diagnosis [21 prescriptions (11.3%)] on the prescriptions. Other problems noted were the absence of the duration of the drugs prescribed [10 prescriptions (5.4%)], absence of age [7 prescriptions (3.8%)] and sex of the patient [8 prescriptions (4.3%)] and the date [6 prescriptions (3.2%)] on the prescription.

Table 1: Common categories of drugs prescribed to orthopaedic outpatients

Category of drugs	Number (percentage)
NSAIDs	211 (59.9)
Multivitamins & minerals	30 (8.5)
Anti-ulcer drugs	20 (5.7)
Centrally acting skeletal muscle relaxants	17 (4.8)
Benzodiazepines	14 (4)
Anabolic steroids	12 (3.4)
Others (antibiotics, antigout drugs, anti TB drugs, serratiopeptidase preparations etc.)	48 (13.6)

Table 2: Most commonly prescribed individual drugs in the orthopaedics outpatient department

Drug	Number (percentage)
Diclofenac sodium	75 (21.3)
Meloxicam	47 (13.3)
Nimesulide	18 (5.1)
Naproxen	18 (5.1)
Famotidine	16 (4.5)
Alprazolam	14 (4)

Table 3: Patterns of use of NSAIDs in orthopaedic outpatients (n=169)

Category	Number (percentage)
Incidence of polypharmacy	
One drug	126 (74.5)
Two drugs	42 (24.8)
Three drugs	1
Route of administration	
Oral	167 (79.1)
Topical	42 (19.9)
Injection	2 (0.95)
Duration of prescription	
Single dose	1 (0.6)
1-2 days	1 (0.6)
3-5 days	47 (27.8)
6-7 days	50 (29.6)
8-10 days	32 (18.9)
>10 days	34 (20.1)
Not written	4 (2.4)
Fixed dose combinations	38 (18)
Extended release preparations	39 (18.5)
Co prescribed with an enzyme preparation	4 (1.9)
Concurrent use of NSAID by oral & topical route	37
Two or more oral NSAIDs	5

Table 4: Analysis of prescriptions from the orthopaedics outpatient department

Parameter	Number (percentage)
Number analyzed	186
Problem prescriptions	51 (27.4)
Problems observed:	
Diagnosis not written	21 (11.3)
Duration of treatment not written	10 (5.4)
Sex not written	8 (4.3)
Age not written	7 (3.8)
Date not written	6 (3.2)
OPD number absent	3 (1.6)

Discussion

A prescription by a doctor may be taken as an indication of the doctors' attitude towards the disease and the role of drugs in its treatment. The mean \pm SD number of drugs in our study was 1.9 ± 0.8 . The average (mean) number of drugs per prescription is an important parameter while doing a prescription audit. The mean number of drugs was lower than that reported in a previous study.⁶ A hospital based study in India had reported a mean number of two drugs.¹¹ The mean number of drugs was more than two in other studies reported in the literature.^{1,12} The number is however, higher than that reported in a previous study.⁵

The commonest indications for attending the orthopaedics OPD were low back ache and

spondylosis. In our study the commonest indications for which an NSAID was prescribed were the above two conditions. In a study in eastern Nepal, the commonest indication for prescribing an NSAID was fractures.⁹ NSAIDs were the most commonly prescribed category of drugs with diclofenac and meloxicam being the most commonly prescribed individual drugs. In eastern Nepal, diclofenac, ibuprofen and piroxicam were most commonly prescribed. A single NSAID was prescribed in 126 instances while 2 NSAIDs were prescribed together in 42 patients. Our results are comparable to that reported previously.⁹

The use of injectable preparations (8.6%) and of FDCs (13.1%) was lower than that reported

previously.^{9, 13, 14} However, our study was confined to the orthopaedic OPD while the Pakistani and the Indian studies were carried out in different OPDs. It will be difficult to compare our data with that obtained from the studies. In our study, 8.5% of the prescribed drugs were multivitamins and minerals. In a previous study conducted in all the OPDs of the Manipal Teaching hospital, multivitamin preparations constituted 9.65% of the drugs prescribed.⁵ However, due to different patient populations the values are not comparable.

Only 19.3% of drugs were prescribed by generic name. The percentage was lower than that previously reported from the Manipal Teaching hospital^{5, 6} but was higher than that observed in a study from Pakistan.¹⁵ Generic prescribing is to be encouraged as it works out to be cheaper for the patient and the possibility of drug errors is reduced.

The average cost of drugs per prescription was 166.2 Nepalese rupees which is lower than that reported previously.⁶ The high cost of topical NSAID preparations and the prescription of glucosamine sulfate for a long period of time may be partly responsible. The drugs were prescribed for a relatively longer duration of time (median period of 7 days). One reason may be it would be difficult and inconvenient for the patient to make frequent visits due to the hilly terrain. In previous studies in our hospital it was observed that around 60% of the patients were from rural areas. In the present study, the address was not written on the prescription and information on whether the patient was from a rural or an urban area was not available. This was a factor which emerged on discussion with the consultants of the department of orthopaedics and was done so that the patient did not have to make frequent visits to the hospital. In a poor developing country like Nepal, cost may be an important factor influencing patient compliance with treatment.

Fifty-one prescriptions (27.4%) had various anomalies. The diagnosis was not mentioned in 21 prescriptions (11.3%) while the duration of prescription was absent in 10 (5.4%). However, the frequency and the quantity of the individual drug prescribed were written in all prescriptions. In our study 122 prescriptions (65.6%) were written by medical officers, 50 (26.9%) were written by the consultants and 14 prescriptions (7.5%) were written by interns. We did not look at the case records and cannot determine whether the medical officers had written the prescriptions for the consultants. There is scope for improvement in the writing of prescriptions

and educational programmes on proper prescribing habits can be organized for doctors at all levels.

The choice of drugs, the duration and the route chosen were appropriate in the majority of cases. The appropriateness was determined by the authors after consulting different sources in the drug information centre and the college library. An anomaly observed was the absence of a written indication in the prescription about whether the NSAID is to be taken before or after food. Though it was not a part of the methodology of the present study we had previously observed that the instruction is verbally given by the doctor and reemphasized by the pharmacist but considering the high risk of gastrointestinal adverse effects of NSAIDs it would be more prudent to mention this on the prescription also.

Our study had a number of limitations. The study was carried out over a three-month period and seasonal variations in disease and prescribing patterns may not have been taken into account. One hundred and eighty-six prescriptions were randomly selected for analysis and these may not have been representative of the patient population attending the orthopaedics OPD during the study period. The number of prescriptions is low. The patients' knowledge of the correct dose, proper time to take the medicine, whether the medicine is to be taken before or after food and the proper method of applying topical preparations were not ascertained. The prescribers were aware of the study and this may have influenced prescribing habits.

Further studies over a longer period of time are required to provide a baseline data of drug utilization in orthopaedics which will be helpful for future longitudinal studies. A longer study will have a greater number of patients and the quantitative measurements may be more representative of the population. On doing a study of one year's duration seasonal variations can be overcome.

Conclusions

The mean number of drugs was low. The percentage of prescribing by generic name was low and efforts to encourage prescribing by generic name should be initiated. The average cost may be high for a poor country like Nepal. The prescribing of topical NSAIDs and of glucosamine sulfate may have been partly responsible. The drugs were prescribed for a relatively longer duration of time. The percentage of encounters with an antibiotic and an injection prescribed was low. This is a welcome sign and has to be encouraged. The use of FDCs was low. Anomalies were noted in some of the prescriptions.

Educational interventions for teaching prescribing skills, for doctors at different levels may be required.

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Author contributions

P Ravi Shankar was involved in the conception of the study, searching the relevant literature, collection of data, analysis of the data and writing the final manuscript. Rajaram Pai was involved in conception of the study, collecting the relevant literature and helped in writing of the final manuscript. Arun K Dubey was involved in conception of the study, collection of data, helped in the analysis of the data and critically revised the manuscript for intellectual content. Dinesh K Upadhyay helped in searching the literature, helped in designing the study, collecting the data and writing the manuscript. All the authors have read and approved the final submitted version of the manuscript.

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