

TEACHING EXERCISE OF DRUG UTILIZATION BY MEDICAL STUDENTS

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ABSTRACT

The prescription is a vital written document communicating between the physician, the patient and the pharmacist. The audit of prescribing pattern is a component of medical audit, which seeks monitoring, evaluation and necessary modifications in the prescribing practices of prescribers to achieve rational and cost effective medical care for the patients. The present drug utilization study was conducted by fourth year MBBS students during their research posting in the department of Pharmacology at B.P. Koirala Institute of Health Sciences (BPKIHS), Dharan. The prescriptions were randomly collected from BPKIHS pharmacy over a period of 3 weeks. The auditing was done in the form of a semi structured performa containing the patients particulars with regard to age, sex, and residence, the details of the illness and prescribed drug information. The data was analyzed at the end of the study. The study points out that the maximum (27.5%) prescriptions were from General Outpatient Department (GOPD) followed by ENT (16.5%), Internal medicine (15.5%) and General surgery (10%). This indicates the distribution of patient load in hospital and the dominant areas to be targeted for intervention. Further, the proportion of antimicrobial agents (AMAs) i.e. 26.03% use was low and was prescribed empirically in most of the cases. There was use of expensive AMAs and irrational prescribing of combinations of AMAs in some prescriptions. Other prevailing drugs which were prescribed were analgesics. The usage of nimesulide and rofecoxib, withdrawn by FDA were used recurrently in this setup. There was greater use of dubious drugs of unproven benefit like vitamins, calcium etc. The diagnosis of the disease were not mentioned in 32.5% of prescriptions. The dose, frequency and duration of drugs were unascertained in majority of prescriptions that might lead to health hazards. This exercise might change the behavior of existing prescribers and also of the future doctors.

Key Words: Drug Utilization, Teaching Exercise, Medical Students, AMA.

INTRODUCTION

The prescription is a vital written document communicating between the physician, the patient and the pharmacist.¹ The prescribing behavior of physician is influenced by information imparted via various sources like patients, professional colleagues, academic literatures, fiscal publicity and government regulations. These sources provide inadequate and purposeless

information resulting in prescribing errors, which is a prevailing entity in current clinical practice. The deficient and asymmetric continuing medical education programmes add to the ignorant and unchecked conduct of the prescribers.² The setting of gold standards for prescribing and regular monitoring for evaluating the quality of health care through surveys or prescription auditing should structure the clinical practice.³ Medical audit oversees the observance of standards of medical treatment at

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all levels of the health care delivery system. Baksaas et al⁴ and Pradhan et al⁵ have stressed the importance of drug utilization studies in evolving a comprehensive drug policy for better health care. Common disease such as acute diarrhoea and acute respiratory tract infections which are mostly due to viral invasion are targeted with the overuse of antimicrobials agents (AMAs).⁶ However, inappropriate treatment of acute upper respiratory tract infections and conditions i.e. tonsillitis with excessive use of antibiotics and symptomatic medicines remains a serious problem.⁷ Far from being a harmless practice, prescribing AMAs for conditions for which there is no proven benefit of such therapy contributes to a number of adverse consequences, including development of bacterial resistance and to increase hospital costs for treating resistant microbes. The audit of prescribing pattern which forms apart of drug utilization study, is a component of medical audit, which seeks monitoring, evaluation and necessary modifications in the prescribing practices of prescribers to achieve rational and cost effective medical care for the patients. This provides feedback to the prescribers so as to create awareness about the propagating irrational use of drugs.^{8,9} The present drug utilization study was conducted by fourth year MBBS students during their research posting in the department of Pharmacology in BP Koirala Institute of Health Sciences (BPKIHS), Dharan. The MBBS curriculum of BPKIHS includes research posting in sixth semester in various departments to orient about research. This practice will facilitate to future doctor's to conduct research activity while practicing in future. These students were allotted this drug utilization study for acclimatization, studying the pattern of drugs prescribed as well as to inculcate the tradition of rational prescribing. The study also made efforts in bridging the gap between clinical pharmacology and rational prescribing of drug. The presentation of data of study to the prescribers and the students may improve the habit of rationale prescribing.

MATERIALS AND METHODS

Two medical students conducted this prospective study in the year of 2003 during 3 weeks research posting in department of Pharmacology. The students were provided training by the author for data collection. They were also oriented about

prescription audit and its importance. The prescriptions were randomly collected from BPKIHS pharmacy during hospital OPD time. The auditing was done in the form of a semi-structured performa containing the patients particulars with regard to age, sex, and residence, the details of the illness and prescribed drug information.

RESULTS

Two hundred outdoor prescriptions were examined. It was observed that a total of 461 drugs, averaging 2.3 drugs per patient were prescribed (Fig.1). A majority of prescriptions were from General OPD (GOPD) conducted by general practitioner (27.5%), ENT (16.5%) and Internal medicine (15.5%). (Fig.1) It was observed that miscellaneous causes formed 33% of total prescriptions, followed by Respiratory Tract Infections (RTI)

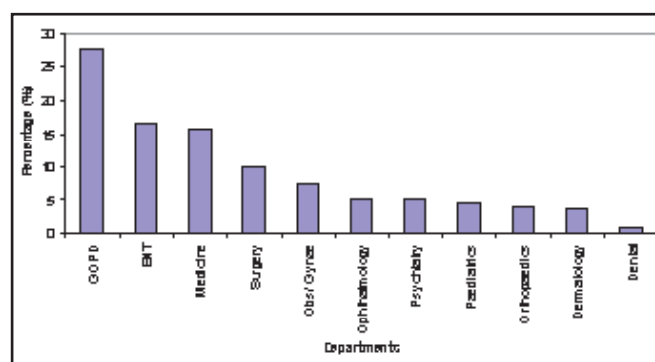


Fig. 1 : Prescription Pattern from various departments (n=200)

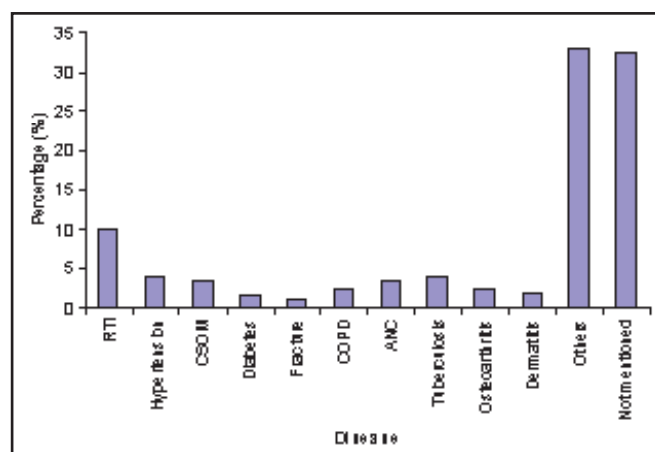


Fig. 2 : Morbidity Pattern (n=200)

Table I : Pattern of antimicrobials (n=120)

S.No.	Antimicrobials (AMAs)	Number (%)
1	Amoxycillin	23 (19.17)
2	Ciprofloxacin	16 (13.33)
3	Moxifloxacin	13 (10.83)
4	Amoxycillin + Clavulanic	6 (5.00)
5	Penicillin	7 (5.83)
6	Cefepime	7 (5.83)
7	Clavulanic	6 (5.00)
8	Ceftriaxone	5 (4.17)
9	Amphotericin	3 (2.50)
10	Others	44 (36.67)

Table II: Pattern of analgesics (n=72)

S. No.	Analgesic	Number (%)
1	Diclofenac	20 (27.78)
2	Paracetamol	20 (27.78)
3	Miscellaneous	14 (19.44)
4	Trupiracetam	2 (11.11)
5	Trupiracetam + Paracetamol	4 (5.56)
6	Indomethacin	2 (2.78)
7	Mefenamic acid	2 (2.78)
8	Aspirin	1 (1.39)
9	Paracetamol	1 (1.39)

Table III: Pattern of other drugs (n=269)

S. No.	Drugs	Number (%)
1	B-complex	12 (6.69)
2	Calcium	12 (6.69)
3	Coumarin	17 (6.32)
4	H ₂ blockers	22 (8.18)
5	Iron	9 (3.35)
6	Proton pump	5 (1.86)
7	Alginic acid	5 (1.86)
8	Vitamin E	4 (1.49)
9	Acetaminophen	4 (1.49)
10	Saltwater	3 (1.12)
11	Others	164 (60.97)

Table IV: Drug Utilization Distribution

S. No.	Department	No. of prescriptions (%)	AMLA (n=120) (%)	Analgesics (n=72) (%)	Others (n=269) (%)
1	ICU	55 (27.50)	31 (25.83)	20 (41.66)	37 (13.75)
2	ENT	33 (16.50)	26 (21.66)	13 (18.05)	22 (8.17)
3	Medicine	31 (15.50)	11 (9.16)	4 (5.55)	27 (10.03)
4	Surgery	20 (10.00)	6 (5.00)	11 (15.27)	13 (4.83)
5	Orthopedic	15 (7.50)	3 (2.50)	3 (4.16)	10 (3.71)
6	Ophthalmology	10 (5.00)	7 (5.83)	3 (4.16)	6 (2.23)
7	Psychiatry	10 (5.00)	-	1 (1.38)	9 (3.35)
8	Pediatrics	9 (4.50)	4 (3.33)	7 (9.72)	6 (2.23)
9	Obstetrics	8 (4.00)	1 (0.83)	4 (5.55)	4 (1.48)
10	Dermatology	7 (3.50)	2 (1.66)	1 (1.38)	5 (1.85)
11	Dental	2 (1.00)	1 (0.83)	2 (2.77)	-

Table V : Details of drugs (n=461)

S. No.	Drug	Dosage form (%)	Dose (%)	Frequency (%)	Duration (%)
1	AMLA (n=120) (26%)	Cap-22 (18.33) Tab-63 (52.50) Syr-13 (10.83) Inj-2 (1.66) Others-20 (16.66)	Not occurred -106 (88.33) Not occurred -14 (11.66)	Not occurred -115 (95.83) Not occurred -5 (4.16)	Not occurred -99 (82.50) Not occurred -21 (17.50)
2	Analgesics (n=72) (15.61%)	Cap-2 (2.77) Tab-50 (69.44) Syr-15 (20.83) Others-5 (6.94)	Not occurred -38 (52.77) Not occurred -34 (47.22)	Not occurred -68 (93.44) Not occurred -4 (5.55)	Not occurred -44 (61.11) Not occurred -28 (38.88)
3	Others (n=269) (58.35%)	Not occurred - 247 (91.82) Not occurred - 22 (8.17)	Not occurred -205 (76.20) Not occurred -64 (23.79)	Not occurred -242 (89.96) Not occurred -27 (10.03)	Not occurred -132 (67.65) Not occurred -27 (32.34)

*Cap-capsules, *Syr-syrup, * Inj-injection

(14%), Hypertension (4%), Otitis Media (3.5%) and Antenatal Checkup (ANC) (3.5%). The diagnosis of the disease was not mentioned in 32.5% of total prescriptions (Fig.2). On considering the patients particulars, it was observed a greater proportion of patients (M:F:117:83) were in the age group 21-30 years followed by 0-10 years age group. Most of the patients were from the local or nearby districts (Fig. 3A, 3B & 3C).

On overviewing the drug pattern, it was observed that AMAs constituted 26% (120/461) of the total drugs included in enrolled prescriptions. The commonly prescribed AMAs were amoxicillin (19.55%), ciprofloxacin (13.33%), metronidazole (10.83%), fixed dose combination of ampicillin and cloxacillin (5%), roxithromycin (5.83%), doxycycline (5.83%), cephalosporin (4.16%) and others (Table I). Next frequently prescribed drugs were analgesics (15.61%) of total drugs. The commonly prescribed analgesics were diclofenac (27.78%), paracetamol (27.78%), nimesulide (19.44%), ibuprofen (11.11%), ibuprofen and paracetamol combination (5.56%), indomethacin (2.78%) and rofecoxib (1.39%) and others (Table II). Apart from these drugs, drugs of dubious efficacy vitamins like B-complex (6.69%) and Vitamin-E (1.49%), calcium (6.69%), cetirizine (6.32%), H₂ blockers (8.18%), iron (3.35) and miscellaneous like antihypertensive, hormones, anthelmintics etc. (60.97%) were prescribed (Table III). It was observed that maximum

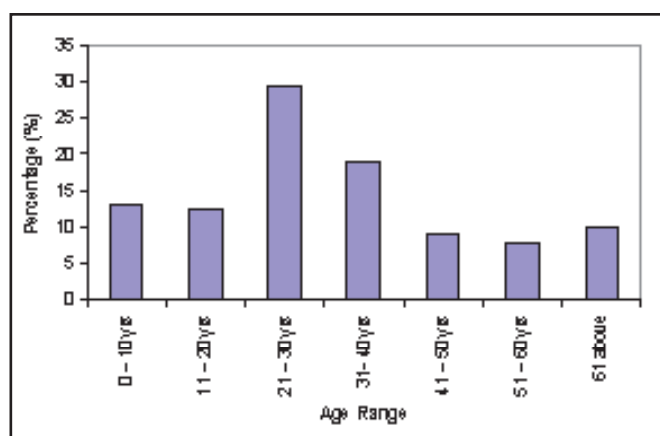


Fig. 3(A) : Age Distribution of the patients (n=200)

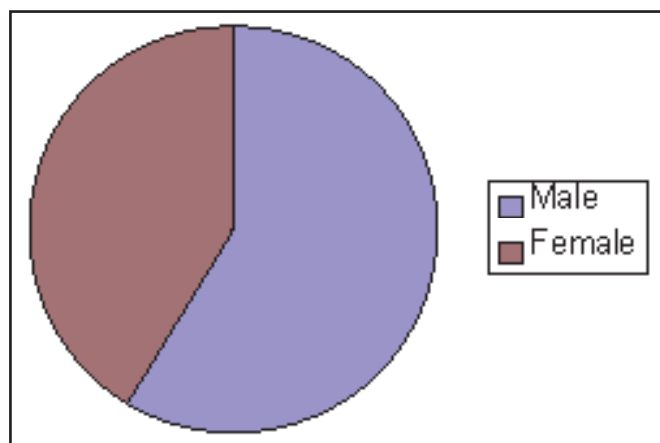


Fig. 3(B) : Sex Distribution of the patients (n=200)

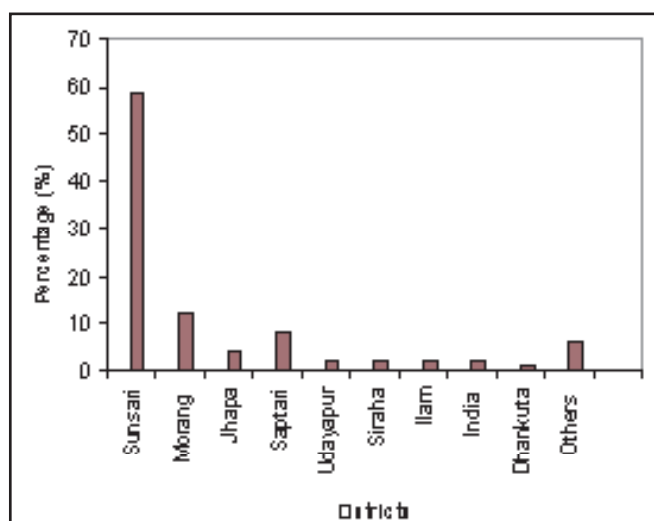


Fig. 3(C) : District Distribution of the Patients (n=200)

drugs including AMA were prescribed by department of GOPD followed by ENT and Internal medicine (Table IV). On evaluating drugs in terms of dosage form, dose, frequency and total duration of drugs used, capsule or tablets were preferred but the dose of AMAs, analgesics and other drugs were not mentioned in 14 (11.60%), 44 (47.22%) and 64 (23.79%) prescriptions respectively (Table V). The duration of prescribed AMAs, analgesics and other miscellaneous drugs were not mentioned in 21 (17.50%), 28 (38.88%) and 87 (32.34%) prescriptions respectively (Table V).

DISCUSSION

Drug overuse in developing countries is often characterized by excessive and inappropriate prescribing. This exposes patients to risk of ineffective treatment and adverse side effects and contributes to superfluous cost burdening to the patients.⁸ A number of reports have demonstrated the importance of studying prescribing behavior.⁹⁻¹¹ Excessive and inappropriate use of AMAs in hospitals contributes to the development of bacterial resistance and to increased hospital costs. Another frequent observed prescribing error is polypharmacy may cause health risks, increasing the risk of adverse drug reaction, medication errors, unnecessary drug expenses, increased risk of hospitalization and poor patient compliance.^{12,13} The present study was a drug utilization study for examining the drug pattern in their institute horizon by the medical students, who will be future prescribers.

The observations from this study points out that the maximum (27.5%) prescription were from GOPD followed by ENT (16.5%), internal medicine (15.5%) and general surgery (10%). This indicates the distribution of patient load in hospital and correspondingly these are the dominant areas to be targeted for intervention for the rational drug use. Additionally, the pattern of diseases in this sector was perceived and acquainted to the

students through auditing of prescriptions. This study also shows the proportion of antimicrobials use, the recurrently prescribed AMAs were amoxicillin, ciprofloxacin, metronidazole, roxithromycin and combination of amoxicillin and cloxacillin. The AMAs were used empirically without doing culture and sensitivity test in most of the cases. There was also usage of expensive AMAs like roxithromycin and cephalosporin and use of more than two AMAs in some prescriptions which is irrational. Though the mean number of AMA per prescription is less but in a developing country like Nepal, cost is an eminent regard.

Other prevailing drugs which were prescribed were analgesics. Among the commonly use analgesics were diclofenac (27.78%), paracetamol (27.78%), nimesulide (19.44%), ibuprofen (11.11%) and rofecoxib (1.39%). The usage of nimesulide in children should be notified and restricted in view of the reported hepatotoxicity, is unauthorized by many nations. The use of unregistered analgesic rofecoxib in Nepal again is the threat to department of Drug Administration (DDA). The greater use of dubious drugs of unproven benefit like vitamins (6.69%), calcium (6.69%) etc should be eluded.

The present study accentuates the existing lacunae in prescribing behavior. It was further observed from the study that the diagnoses of the disease were not mentioned in 32.5% of prescriptions, this is an erroneous offensive on behalf of prescriber. The dose, frequency and duration of drugs were unascertained for predominantly prescribed AMAs, analgesics and other group of drugs. Such incomplete prescriptions fail to provide complete information to the patient as well as to the drug dispenser and could result health hazards.

The results were presented to all medical students to acclimatize them with common prescribing errors and the treatment interventions required rationalizing the use of drugs. This exercise might change the behavior of existing prescribers by disseminating the data to prescriber and future doctors in presence of institute executives. Such type of study should be conducted frequently in large scale to provide feedback to prescribers to correct the error. If the study will be conducted by future doctors will be more effective as they will be familiar with rational drug use.

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