

**Prescription Audit carried out at the Pharmacy Practice Centre of the University of Nairobi between June and November 2004**

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A retrospective descriptive study was carried out from June to November 2004 in a retail pharmacy situated at the School of Pharmacy, University of Nairobi within the Kenyatta National Hospital complex. The objective was to evaluate prescribing habits and to determine the frequency of prescribing of commonly used drug classes in a hospital. The average number of drugs per prescription was  $2.20 \pm 1.16$ . The prevalence of prescribing was 28.6% anti-infective drugs, 21.1% musculoskeletal agents, 16.6% respiratory system drugs, 8.1% cardiovascular system drugs, 7.2% central nervous system drugs, 7.1% gastrointestinal system drugs, 4.3% minerals and vitamins, 2.1% ear, nose and throat drugs, 1.1% endocrine drugs, 2% skin preparations, 0.9% anticancer drugs and 0.74% eye preparations. The prescribing habits evaluated were compared to the legal requirements in Kenya and to recommended international practice. The information gathered may serve as a basis for rational use of drugs.

**Key words:** Prescription audit, prescriptions, drugs, polypharmacy

### INTRODUCTION

Quality of life 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 [1]. Setting standards and assessing the quality of care through performance review should become a part of everyday clinical practice [2]. The study of prescribing patterns seeks to monitor, evaluate and if necessary suggest modifications in prescribing practices of medical practitioners to make medical care rational and cost effective. Auditing prescriptions also forms part of drug utilization studies [3].

Realizing the enormous potential of drug utilization studies in promotion of rational drug therapy, international agencies like the World Health Organization (WHO) and the International Rational Utilization of Drugs (INRUD) have committed themselves to evolve standards for drug use and data collection methods. Studies of prescribing

patterns have been reported at both hospital [4-6] and community levels [7-9]. All these studies have assessed drug utilization by counting prescriptions as a parameter to determine the prescribing patterns.

We undertook a pharmacy-based prescription audit at the Pharmacy Practice Center (PPC), School of Pharmacy, within the University of Nairobi. The PPC is a community pharmacy serving mainly the Kenyatta National Hospital and its environs and the clients pay for the medicines at prevailing market rates. It is also used as a model teaching facility for the School of Pharmacy students. We analyzed the frequency of prescribing of all major classes of drugs as presented in the British National Formulary namely anti-infective, anticancer, minerals and vitamins, endocrine system, gastrointestinal, cardiovascular, respiratory system, ear-nose-throat, eye, skin and central nervous system. These are the most commonly prescribed drugs for which the likelihood of interactions, therapeutic duplication and polypharmacy can easily be

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identified. The study further sought to assess the presence of defects and legal omissions that would complicate the dispensing of the prescribed drugs, thus making rational use impracticable.

## MATERIALS AND METHODS

All the prescriptions presented at the PPC during general working hours over a six-month period (June to November 2004) were screened by members of the investigating team. The number of drugs prescribed in every prescription was taken into account to calculate the prevalence of polypharmacy. Data for all the major categories of drugs on each prescription was stored in a computer data base file for retrieval and analysis with the following fields of entry: patient information including name, age, weight, sex, and address; drug information including source of prescription, legibility of writing, date of prescription, name of drug and accuracy of dosing. The prescriber information noted included name, designation and signature. MS Excel was used for data analysis. Prescribing prevalence was expressed as a percentage for each of the listed classes of drugs out of the total number of drugs on all the prescriptions presented at the PPC during the study period.

## RESULTS

During the study period, 786 prescriptions containing 1736 drugs were processed at the PPC. Most of the prescriptions had at least one defect such as illegibility. Others lacked the date, name of patient, name and signature of prescriber, address of the patient and source. None of the prescription had the weight of patient. In some cases,

dosages were inaccurate and frequency was missing (Table 1). All the prescriptions had the drug names clearly indicated. The mean number of drugs per prescription was  $2.2 \pm 1.16$  and the range was 1-7 drugs.

The overall prescribing frequency was found to differ from one class of drugs to another as shown in Table 2. The most prescribed category of drugs was anti-infective followed by musculoskeletal system, respiratory system, cardiovascular system, central nervous system, gastrointestinal system, minerals and vitamins, ear-nose-throat, skin preparations, endocrine system agents, anticancer and eye preparations in decreasing order. The prevalence of prescribing anti-infective drugs varied with antibiotics being the most prescribed and antivirals the least (Table 3). Among the central nervous system drugs, the prevalence of prescribing in descending order was antiemetics, hypnotics and anxiolytics, antidepressants, antiepileptics, antiparkinsonism drugs and antipsychotics (Table 4). Respiratory system drugs included antihistamines, cough preparations, corticosteroids, cromoglicate, bronchodilators and mucolytics (Table 5). Seven categories of cardiovascular system drugs were prescribed with  $\beta$ -blockers being the most prescribed and nitrates the least as shown in Table 6. Gastrointestinal agents consisted of antacids, ulcer healing drugs, antispasmodics, laxatives, antidiarrhoeals and anti-haemorrhoidals (Table 7).

The six classes of most commonly prescribed drugs accounted for 89% of total drugs on the 786 prescriptions handled at the Pharmacy Practice Centre during the study period

**Table 1: Percentage of prescriptions with errors**

Error	Prescriptions (% of total)
Illegible	108 (13.7)
No date	28 (3.56)
No patient name	25 (3.18)
No patient address	768 (97.71)
No patient age	768 (97.71)
No drug name	0 (0)
Prescription source missing	58 (7.38)
No patient weight	786 (100)
Dosage accuracy	763 (97.10)
No dosing frequency	7 (0.89)
No name of prescriber	145 (18.45)
No signature	53 (6.74)
No designation	214 (27.22)
<b>Total</b>	<b>786 (100)</b>

**Table 2: Prescribing prevalence of main classes of drugs**

Class	Number of drugs (%)
Anti-infective drugs	501 (28.6)
Musculoskeletal system agents	366 (21.1)
Respiratory system agents	288 (16.6)
Cardiovascular system drugs	140 (8.1)
Central nervous system drugs	125 (7.2)
Gastrointestinal system drugs	123 (7.1)
Minerals and vitamins	75 (4.3)
Ear, nose and throat preparations	36 (2.1)
Skin preparations	35 (2.0)
Endocrine system agents	19 (1.1)
Anticancer drugs	15 (0.9)
Eye preparations	13 (0.7)
<b>Total</b>	<b>1736 (100)</b>

**Table 3: Prescribing prevalence of anti-infective drugs**

Class	Percentage
Antibiotics	20.5
Antiprotozoals	5.18
Antifungals	2.07
Anthelmintics	0.69
Antivirals	0.40

**Table 4: Prescribing prevalence of central nervous system drugs**

Class	Percentage
Antiemetics	2.94
Hypnotics and anxiolytics	2.53
Antidepressants	0.98
Antiepileptics	0.35
Antiparkinsonism drugs	0.17
Antipsychotics	0.17

**Table 5: Prescribing prevalence of respiratory system drugs**

Class	Percentage
Antihistamines	5.07
Cough preparations	4.61
Corticosteroids	4.09
Cromoglicate	3.46
Bronchdilators	2.2
Mucolytics	0.29

**Table 6: Prescribing prevalence of cardiovascular system drugs**

Class	Percentage
$\beta$ -blockers	5.18
Diuretics	2.65
CCBs	1.32
Cardiac glycosides	0.86
ACEIs	0.86
Lipid regulators	0.52
ANG II antagonists	0.35
Antiplatelets	0.29
Anticoagulants	0.23
CAAs	0.23
Nitrates	0.12

ACEIs = Angiotensin converting enzyme inhibitors, CCBs = Calcium channel blockers, CAAs = Centrally-acting antihypertensives, ANG = Angiotensin.

**Table 7: Prescribing prevalence of gastrointestinal drugs**

Class	Percentage
Ulcer healing drugs	2.9
Antacids	1.9
Antispasmodics	1.56
Laxatives	0.29
Antihaemorrhoidals	0.29
Antidiarrhoeals	0.17

## DISCUSSION

*Prevalence of polypharmacy:* In this study it was found that up to seven drugs were prescribed simultaneously and only 35.8% of the prescriptions had one drug. This showed that polypharmacy was practised thus increasing chances of adverse drug reactions and interactions. In most cases it is difficult to keep the mean number of drugs per prescription below two, but higher figures always ought to be justified [10-11]. Community-based studies on prescribing patterns conducted from other outlets have reported a mean number of two drugs per prescription [8]. Similarly, hospital-based studies have reported 3-5 drugs per prescription [4-6] while studies carried out in Ethiopian primary health care centers showed a mean of 2.11 which is not significantly different from the mean obtained in the present study [12].

*Prevalence of prescribing:* Prescribing prevalence studies are useful to determine the prevailing morbidity patterns. For example, the high prescribing frequency for anti-infective drugs such as antibiotics (20.5%) and antiprotozoals (5.18%) could imply either a high index of infectious diseases within the community or empirical prescribing irrespective of the availability of microbial laboratory tests. Analgesics and skeletal muscle relaxants had one of the highest prescribing prevalences (21.1%) indicating that there may be a high prevalence of musculoskeletal disorders such as rheumatism and spasms which are associated with pain and inflammation. Respiratory system drugs were third among the most prescribed drugs (16.6%) indicating that both allergic and infectious respiratory ailments were common. Cardiovascular drugs constituted 8.1% implying the existence of diseases such as hypertension, hyperlipidemias, congestive heart failure and arrhythmias. Drugs used in the management of gastrointestinal diseases had a 7.1% prevalence showing that diseases such as peptic ulcer disease, dyspepsia, gastroesophageal reflux, constipation,

haemorrhoids and diarrhoea contributed significantly to overall morbidity.

*Prescribing habits:* Analysis of prescribing habits was done to assess the presence of defects that would complicate the dispensing of the prescribed drugs and also to find out whether the prescribers complied with the legal requirements. Prescriptions should be written legibly in ink or otherwise so as to be indelible, should be dated, bear the full name and address of the patient and should be signed by the prescriber. The age of the patient should preferably be stated and it is an ethical requirement in the case of 'prescription only' medicines for children under 12 [13-14]. From our study, 97.7% of the prescriptions did not show the age or the address of the patients. Consequently, determination of dose accuracy was not possible. The details on the prescription were insufficient to help detect patients on repeat visits since many of them did not bear name, age and address of the patient.

### CONCLUSION

The results of this study show the prevailing prescribing habits at the Kenyatta National Hospital and possibly within the Nairobi City health facilities. The information can be used in adverse drug reaction monitoring programs, intervention and improvement in prescribing habits. The value of such audits in generating and testing hypotheses on inappropriate prescribing has resulted in educational interventions to improve prescribing habits [15].

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