EXTENT OF OCCURRENCE OF PRESCRIBING ERRORS IN A PRIVATE TERTIARY – CARE HOSPITAL IN DAR ES SALAAM

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Abstract

Background: Correct prescription writing has a great influence on the fate of medicine therapy and health of patients. Errors in prescribing may be classified into two main types: errors of omission and errors of commission. Errors of omission are where a prescription is incomplete whereas errors of commission contain incorrect information. In the United States of America 1-2% of inpatients are at a risk of being harmed by errors in prescribing. In the United Kingdom 61% of medication errors originated in medication order writing. However little is known about prescribing errors in Tanzania.

Objective: To investigate the nature and extent of errors of omission and commission in prescriptions in a tertiary-care private hospital as well as to determine which department is responsible for majority of the errors.

Methodology: This was a descriptive study involving a total 450 prescriptions, which were sampled out using a systematic sampling method. Each prescription was examined for a possible prescribing error of "omission" and "commission". Errors of omission and commission related to the prescribed medicines were recorded and medicine-medicine interactions were confirmed with standard references. The names of the departments where prescriptions originated were also recorded.

Results: 99.6% of all prescriptions had at least one or more errors which involved omission of either the patient's age (2.9%), name (1.6%), weight (93.8%) or route of administration (94%), dose (5.4%), frequency (3.2%), dosage form (24.8%) and duration of treatment (14.1%). Errors of commission accounted for 3.1% of all prescribed medicine. This study has shown that 55.1% of prescribing errors originated from the outpatient polyclinic department.

Conclusion: The results of this study demonstrate occurrence of errors of omission and commission in prescription writing. This calls for medical doctors and pharmacists trainers to critically address the importance of writing correct and complete prescriptions in order to minimize occurrence of medication errors.

Key words: Prescriptions, Prescribing errors, Errors of omission, Errors of commission, Medicine – Medicine interaction.

Introduction

The process of evaluation and analysis of a prescription and assessing its completeness is a task of a pharmacist who in actual fact is a final barrier before a patient receives the medicines.[1] Prescription deficiencies account for a large percentage of prescribing errors identified during analysis of prescriptions.[2-4] Correct prescription writing habits have a great influence on the fate of medicine therapy as well as the health of patients. Errors in prescription writing in fact include any deviation from proper rules and guidelines of prescription writing.[1, 2] Much as these errors could occur merely due to forgetting, not considering something important, or eventually omitting certain information from a prescription, it is referred to as an "error of omission".

Common errors of omission include absence or incomplete specification of dosage form or strength, dosage regimen, quantity or duration of medicine to be supplied, route of administration, dose and frequency of medicine to be used, absence of the patient's age, name, clinic or department's name where the prescription was issued and illegible prescriptions.[5] Errors of prescribing occurring due to wrong written information on a prescription as a result of improper comprehension, misdiagnosis or incorrect selection of a medicine are known as "errors of commission".[1,5] The most common errors of commission include mistakes in writing medicine names, writing the incorrect dosage form, choosing the wrong strength of the medicine, duplicate therapy and medicine-medicine interactions.[6,7]

Several studies have reported on occurrence of prescribing errors involving various types of errors.[8-10] In a study by Kuan Mun *et al*, in an outpatient pharmacy department it was revealed that 96.7% of all prescriptions studied in a single day had one or more errors of omission.[5] In another study that was investigating the nature and extent of occurrence of errors in an inpatient ward of a teaching hospital it was reported that 18% of errors of commission resulted from ignoring medicine interactions.[1] A study on survey of prescription errors in general practice in the United Kingdom by Nadeem *et al* demonstrated a wide range of different types of errors occurring at the rate of 7.46 per 100 items (95% CI, 7.2-7.8) and without careful checking by the pharmacist patient harm was inevitable.[11] In Tanzania studies on different types of prescribing errors have hardly been reported. Therefore, this study was conducted to evaluate the extent of prescription errors in a tertiary level private hospital in Dar Es Salaam. The main objectives were to identify different types of prescribing errors and determine which department was responsible for majority of errors. Outcome of this study would make the basis for an intervention in the effort of minimizing prescribing errors.

Methodology

Study design and area:

This descriptive study was retrospectively conducted in an outpatient pharmacy department (OPPD) of a tertiary – care private hospital in Dar Es Salaam during the month of February and March, 2005. At the time of data collection, a registered pharmacist and three pharmaceutical technicians manned the pharmacy department.

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Sampling Methods

The sample size expression $n = 4p(100-p)/\varepsilon^2$ was used to determine the number of prescriptions required for the study. Maximum expected error (ε) margin of 4.7% and assuming prevalence (p) of prescribing errors is about 50%[9] hence a sample size (n) of 450 prescriptions was determined.

Methods:

The study involved retrospective screening of prescriptions received at the OPPD during the month of December 2004. A researcher, one pharmaceutical technician and the pharmacist obtained the prescriptions for studying from the records using a systematic sampling approach and screened them for occurrence of prescribing errors retrospectively. The data collector recorded the types of prescribing errors and entered them in a standard form that was designed by the authors. Prescribing errors recorded included errors of "omission" and "commission". The errors of omission included prescriptions without the patient's age, name, weight; date of prescription, registration number, route of administration, dose, name and frequency of the medicine to be used, dosage form, quantity of medicine to be supplied; illegible prescriptions; prescriber's name, qualification and signature. For the purpose of this study an illegible prescription was any prescription that could not be read by the data collector. Only errors of commission related to the medicines were recorded and medicine-medicine interactions were confirmed with standard references.[12,13] The data collector also recorded names of the departments where prescriptions originated.

Data analysis:

The data analysis was done both manually and by using a computer program (SPSS, version 10.0) through which descriptive statistics were performed.

Results

Out of 450 prescriptions that were analyzed 448 (99.6%) were found with some errors. Table 1 of results shows errors of omission that were related either to the patient or prescriber. Omission of weight of patient (93.8%) accounted for the majority of this type of errors. Further results indicate that, out of 450 prescriptions, a total of 1019 medicines were prescribed hence giving an average of 2.26 medicines per prescription. All medicines that were prescribed erroneously, 960 (94%, n=1019) were prescribed without indication of the route of administration, 24.8% without dosage forms and 5.4% without doses. Further, 3.2% medicines were prescribed without frequency and 14.1% without duration of treatment. Further, Table 2 shows the errors of commission that was detected which involved 32 (3.1%) medicines prescribed on the 450 analyzed prescriptions. Medicines that were prescribed with wrong dosage form included Grovit® and Brustan® tablets which were prescribed as capsules. Actifferin®, Revital® and Duracef® capsules were prescribed as tablets. Also results indicated some medicines were prescribed with wrong doses. These included paracetamol 1000mg tablets were prescribed as 100mg and ciprofloxacin 500mg tablet as 50mg. Only 0.2% medicine-medicine interactions were recorded. Majority of the prescriptions with errors were from the Outpatient polyclinic (55.1%). Others, 18.30% were from the Paediatric ward, 9.4% from the Medical ward, 5.13% from Obstetric and Gynecology and 3.35% from surgical clinic. Still 8.72% came from units such as Dentistry, ENT, Orthopedics, Radiology and Urology (Table 3).

Table 1: Errors of omission that were related to the patient or prescriber (N=448)

Errors of omission	Frequency	%
Date	0	0
Patient name	7	1.6
Age	13	2.9
Registration number	0	0
Weight of patient	420	93.8
Presciber's name	3	0.7
Presciber's signature	3	0.7
Presciber's qualification	3	0.7
Illegible	0	0

Table 2: Errors of Commission that were related to prescribed medicines (n =1019)

Error of Commission	%	Frequency
Wrong strength	2	0.2
Wrong dosage form	28	2.7
Medicine-medicine interaction	2	0.2
Total	32	3.1

Table 3: Distribution of prescriptions with errors from various hospital departments (N=448)

Name of Department	%	frequency
Dental	2	0.45
ENT	6	1.34
Ophthalmology	8	1.79
Obstetric and Gynecology	33	5.13
Out patient	248	55.1
Orthopedics	7	1.56
Paediatric	21	8.30
Medical	42	9.4
X-ray	1	0.22
Surgery	15	3.35
Urology	1	0.22
Un-named department	3	0.67
Total	448	100

Discussion

This study revealed that 96.6% of all prescriptions were prescribed with one or more errors. However, similar results have been obtained elsewhere.[5] Of these prescriptions 93.8% had no patient weight and 1.6% had no patient names written on them. This calls for the hospital to further address the necessity of writing correct and complete prescriptions. Useful indicators for prescription writing which include writing the patient's name in full, printing the name of the medicines especially the newly introduced and rarely prescribed have been reported elsewhere.[14,15] However, results show none of the prescriptions was illegible. The issue of illegibility assessment is quite subjective and depends on the familiarity with handwriting of the prescribers as well as the information provided in the prescription. This has been demonstrated in the present study where the resident pharmacist was familiar with the prescribers' handwritings managed to read all prescriptions (0% illegible prescriptions, Table 1).

Results on the rate of error of omission related to the medicines varied from 94% of medicines prescribed without route of administration to 3.2% of medicines without frequency of administration. On the other hand, the 6% of the medicines that were prescribed with route of administration majority involved external preparations. One could predict the reason as to why externally applied medicines were cautiously prescribed may be due to the adverse events in case they were mistakenly internally administered. As it appears, the route of administration was not usually specified in the prescriptions and this was acceptable since it never prevented a prescription from being filled by the dispensers wherever the dosage form is indicated. Omission of route of administration has also been reported elsewhere however this specification may help to identify the unspecified dosage form if needed.[5]

Other errors of omission such as absence of the patient's age could be resolved at the pharmacy through verbal communication between the dispenser and the patient. Table 2 of results shows errors of commission that were detected in this study which involved 32 medicines. Of these medicines paracetamol and ciprofloxacin tablets for an adult were prescribed with wrong strength. Paracetamol 1000mg tablets were prescribed as 100mg and ciprofloxacin 500mg tablet as 50mg. If the strength of a medicine required is written wrongly, it may lead to more serious consequences than if the strength is not written at all. This can be excused especially if the medicine is available as a fixed strength in a certain dosage form only, then this type of error could be easily identified and rectified.[5] In this study wrong dosage form (2.7%) accounted for majority of errors of commission. Normally, wrongly written dosage form does not lead to serious consequences unless the strength or frequency of use of that dosage form is also different. Only two medicine-medicine interactions were identified in this study and one of them (propanolol and theophyline) could be considered potentially hazardous in asthmatic patients.[16] The aim of reporting such medicine-medicine interactions is to bring awareness to the health care professionals so that appropriate precautions would be observed to minimize any adverse reactions. In this study it was also noted that most of the prescriptions with errors were from the outpatient polyclinic department (55.1%) and the rest from other departments (Table 3). Paediatric department contributed 18.3% to the prescriptions with errors. Most of prescribing errors were observed from the outpatient polyclinic where most of the prescribers were junior medical staff as compared to the specialized clinics. Dean *et al* have reported similar results in the study on prescribing errors in hospital inpatients. [17] Slightly high frequency of occurrence of errors was observed from the Paediatric ward. This incidence could be a result of miscalculation of doses in children, which can be easily confused or missed out, and this tendency has been also reported elsewhere. [18]

Conclusion

This study has demonstrated occurrence of errors of omission and commission in prescription writing. Most of prescriptions with errors originated from the outpatient polyclinic department. This indicates a need for medical doctors trainers to further address the importance of writing correct and complete prescriptions as well the pharmacists to be very keen on checking for prescribing errors before filling the prescriptions in order to minimize the rate of occurrence of medication errors.

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