Noncompliance with Prescription Writing Requirements and Prescribing Errors in an Outpatient Department

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ABSTRACT

New prescriptions received by an outpatient pharmacy department of a teaching hospital were audited retrospectively for noncompliance with prescription writing requirements as well as to identify the types of prescribing errors. Of the 397 prescriptions screened in a single day, 96.7% had one or more of the legal or procedural requirements missing. These errors of omission, included prescriptions without the patient’s age, date, clinic or department where the prescription was issued, route of administration, dose and frequency of the drug to be used, strength, dosage form and quantity of drug to be supplied. Additionally, there were errors of commission involving 8.4% of the prescribed drugs. A total of 39 drug-drug interactions were identified; 15 were classified as potentially hazardous but could be overcome with careful monitoring of the patients. The results of the present study show a low compliance rate to the legal and procedural requirements in prescription writing. This indicates a need for pharmacy and medical educators to further emphasize the importance of writing clear and complete prescriptions. It also calls for the implementation of educational and monitoring programmes to bring more awareness to all concerned so as to reduce the rate of noncompliance and hence minimize the occurrence of prescribing errors.

Keywords: prescription screening, pharmacist, compliance, errors of omission, errors of commission

INTRODUCTION

The screening of prescriptions and intervention process commences with the pharmacist’s initial assessment for completeness and legality of the prescriptions. Prescription deficiencies formed a large proportion of errors identified in prescription screening (1). This is mainly due to the attitude of some prescribers who are always in a hurry and hence unwilling to spend a little more time in writing clear and complete prescriptions. However, the extra time spent on the prescription will help to ensure that the patient receives the treatment that is intended by the prescriber. Additionally, the prescriber will be well compensated for the extra time taken by not having to answer enquiries from the pharmacist (2).

Errors in prescribing may be classified into two main types, errors of omission and errors of...
commission. Errors of omission are defined as prescriptions with essential information missing while errors of commission involve wrongly written information in the prescriptions (3). Errors of omission include absence or incomplete specification of dosage form or strength, dose or dosage regimen, quantity or duration of drug to be supplied as well as prescriptions that are illegible and prescriptions that violate legal requirements. Whereas, errors of commission include wrong dose or dosage regimen, wrong drug or its indication, wrong quantity or duration of therapy, incorrect patient’s name on the prescription, duplicate therapy and drug-drug interactions.

Noncompliance with prescription writing requirements involves mainly errors of omission. A study by Ingrim and colleagues (4) in an outpatient pharmacy department found that the overall rate of prescription noncompliance was 14.4%. In this study, the pharmacists spent 16.3 hours each day correcting prescription errors. Most of the other studies in the literature focused more on the prescribing errors that involved mainly errors of commission as well as pharmacist intervention. This includes an audit on community pharmacies that identified 153 prescriptions with errors from a total of 5874 new prescriptions (2.6%) [1]. Other studies found the rate of prescribing errors between 2.6% to 15.4% or estimated as 2.87 to 4.9 per 1000 medication orders (1, 5-11).

Studies on the types of prescribing errors in Malaysia appeared scarce in the literature. Therefore, the present study was conducted to evaluate the extent of noncompliance with prescription writing requirements as well as to identify the types of prescribing errors.

**METHOD**

This study was conducted in the Outpatient Pharmacy Department (OPPD) of a major teaching hospital in Malaysia in 1998. This OPPD received an average of 1057 prescriptions per day during the study period and was operated by one registered pharmacist, 3 trainee pharmacists and 8 pharmacy assistants.

The study involved retrospective screening of new prescriptions received by the mentioned OPPD in a day. A researcher with pharmacy training but not a staff of the OPPD, collected the prescriptions for a single day and screened them retrospectively. Any prescription that did not comply with one or more of the legal or the hospital procedural requirements (12-13) would be considered as noncompliance and this was recorded in a standard form. These were mainly errors of omission, including illegible prescriptions. A prescription would be considered as illegible in this part of the study if the researcher could not read it. Errors of commission that were related to the drugs prescribed were also recorded. Any drug-drug interaction was confirmed with standard references (14-16).

**RESULTS**

**Errors of omission**

Of the 1057 prescriptions received on the day of the study, only 397 new prescriptions were included in the study. Repeat prescriptions were excluded as the prescriptions had to be returned to the patients and hence were not available for evaluation. Of these prescriptions, 96.7% did not follow at least one of the legal or procedural requirements and these are classified as errors of omission (Table 1 and 2).

**Table 1: Errors of omission that were related to the patient or prescriber or place of issue of the prescription ( n = 397).**

<table>
<thead>
<tr>
<th>Errors of Omission</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient’s name</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Age</td>
<td>130</td>
<td>32.7</td>
</tr>
<tr>
<td>Registration number</td>
<td>2</td>
<td>0.5</td>
</tr>
<tr>
<td>Date</td>
<td>68</td>
<td>17.1</td>
</tr>
<tr>
<td>Prescriber’s name</td>
<td>7</td>
<td>1.8</td>
</tr>
<tr>
<td>Prescriber’s signature</td>
<td>1</td>
<td>0.3</td>
</tr>
<tr>
<td>Clinic or department</td>
<td>65</td>
<td>16.4</td>
</tr>
<tr>
<td>Illegible</td>
<td>28</td>
<td>7.1</td>
</tr>
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</table>
A total of 862 drugs were prescribed in these 397 prescriptions giving an average of 2.2 drugs per prescription.

Of the 321 prescriptions with the gender of the patient indicated, about half (50.8%) were for females and the other half (49.2%) for males. From the prescriptions with the clinic or department indicated, a majority of the prescriptions was from the outpatient polyclinic (79.2%), another 16.6% were from the wards and 4.2% from units such as the Accident and Emergency Unit, Rehabilitation Unit, Radiology Department and Operation Theatre. The researcher who screened the prescriptions was unable to read 28 prescriptions (7%) but the pharmacist-in-charge of the OPPD could not read only three of these prescriptions (0.76%).

Two of the prescriptions did not contain the name of the drug required but were merely written as “syrup mixture expectorant” and “antacid”. Only 20% of the drugs prescribed had the route of administration written and these involved mainly topical or external preparations (73%). Of the 485 drugs prescribed without strength specifications, 2.5% involved drugs with more than one strength available.

A total of 314 drugs prescribed (36.4%) did not have the dosage forms written on the prescription and 33.4% of these drugs have more than one dosage form available. These included salbutamol, paracetamol, cloxacillin, amoxycillin, bisacodyl, and betamethasone. Of the 75 preparations with no dose indicated, six were oral rehydration salts, two were glyceryl trinitrate and two were Gelusil®. The others involved eye products, mouth and preparations, topical decongestants and nasal preparations, and ear products. Topical preparations such as creams or ointments where dose specification is not relevant were not included.

Additionally, the quantity to be supplied was not indicated for 50 drugs. These include dermatologials (n=10), analgesics and antipyretics (n=9), eye, ear, mouth and throat preparations (n=8), antacids and antulcerants (n=6), and nasal preparations (n=4).

**Errors of commission**

Table 3 shows the errors of commission detected in this study. The 27 drugs with wrongly written dosage form included Benadryl syrup instead of expectorant for adult patients from 15 prescriptions. Others were nystatin and cotrimoxazole being prescribed as syrups instead of suspensions, cloxacillin, doxycyclin, phenytoin and ketoprofen being prescribed as tablets instead of capsules or sustained-release capsules.

A total of 39 drug-drug interactions were detected in 20 of the prescriptions (5%). The groups of drugs most commonly indicated were the beta-adrenergic blockers (n=13), anti-diabetic agents (n=12), diuretics (n=10), calcium channel blockers (all 9 cases involved nifedipine), angiotensin-converting enzyme (ACE) inhibitors (n=7), corticosteroids (all six cases involved prednisolone) and cardiac glycosides (all five cases involved digoxin). Fifteen of these interactions could be classified as potentially hazardous and should be avoided if possible or appropriate monitoring and precautions should be taken.
DISCUSSION

Errors of omission

Only 13 out of the 397 prescriptions screened complied with all the legal requirements in the Poisons Act 1952 and also the procedural requirements of the hospital surveyed. This indicates a need for the hospital to further emphasize the necessity of writing clear and complete prescriptions. Some useful pointers for prescription writing have been suggested (2, 17). These included writing the patient’s full name, printing the name of drugs especially those newly marketed medications and those infrequently prescribed agents, as well as indicating the strength and dosage form of all drugs prescribed even if only single strength or dosage form is available.

The rate of noncompliance to the legal or procedural requirements varied from 80% of drugs prescribed with no indication of the route of administration to 0.3% of prescriptions without the prescriber’s signature. The seriousness of such noncompliance depends on the types of errors of omission.

The absence of the patient’s age would not normally prevent the dispensing of the prescription. It could be easily resolved with the patient or the holder of the prescription if required. Whereas, the absence of the prescriber’s signature would invalidate the prescription and cause inconvenience to the patient and staff involved. This is especially crucial if the prescription was for psychotropic or dangerous drugs (controlled drugs).

The omission of the strength or dosage form required may not pose any problem if the drug prescribed is available in single strength or dosage form. However, with the rapid advances in drug development, many drugs are increasingly available in various strengths and dosage forms and hence this type of error of omission may pose some problems. For example, salbutamol is available in the form of 2 or 4 mg tablets, 4 mg sustained-release tablets, syrups, inhalers, easyhaler inhalation powder, turbohaler, respirator solutions, rotacaps, nebules and injections.

Most of the preparations prescribed with no indication of the dose to be used were external preparations such as eye or ear drops, except for the prescriptions with oral rehydration salts, glyceryl trinitrate and Gelusil®. The prescribers had probably assumed that the pharmacy staff would give the appropriate standard instructions. However, it should be emphasized that all oral preparations should be prescribed with specific doses as the prescription has limited information for the pharmacy staff to judge the prescriber’s intention.

It appeared that the oral route of administration was not usually specified in the prescription and this was acceptable, although in some instances the route specification may help to identify the unspecified dosage form. Drugs prescribed without indication of total quantity to be supplied involved analgesics and antipyretics as well as antacids and ulcer-healing agents. Although many of these drugs may be given on “as required” basis, the prescriber is still the best judge on the total quantity to be supplied based on the patient’s medical requirement. Even for dermatological, eye, ear, mouth or nasal preparations, an indication of the amount to be supplied is still necessary.

Legibility assessment is quite subjective and thus may be biased in the study. Whether a prescription is legible or not depends on the assessor’s familiarity with the handwriting of the prescriber as well as information provided in the prescription. This has been demonstrated in the present study where the researcher could not read 28 prescriptions as compared to the pharmacist of the hospital who was unable to read only three prescriptions. However, it should be emphasized that prescriptions should be easily read by anyone

<table>
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<th>Table 3: Errors of commission (n = 862)</th>
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<tbody>
<tr>
<td>Errors of Commission</td>
</tr>
<tr>
<td>Wrong strength</td>
</tr>
<tr>
<td>Wrong dosage form</td>
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<tr>
<td>Drug-drug interactions</td>
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<tr>
<td>Total errors of commission</td>
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</table>
Research article: Noncompliance with prescription writing requirements

involved in the dispensing activities since the prescriptions could be filled by any pharmacy outside the hospital. This is especially important since many drugs tend to have similar names such as Losec® and Lasix® or Daonil® and Amoxil® (18). This type of error may be reduced if the indication of the drug prescribed or the medical problem of the patient is also written in the prescription as suggested by Robinson (17). Therefore, all prescriptions should be clearly and adequately written and if possible printed to prevent such medication errors. The implementation of electronic prescribing will probably eliminate some of these problems.

Errors of commission

Errors of commission represent a greater threat to the patient’s health than errors of omission, if it is not identified and corrected. If the strength of a drug required is written wrongly, it may lead to more serious consequences than if the strength is not written at all. If the drug is available as a fixed amount in a certain dosage form only, then this type of error could be easily identified and rectified. For example, if amoxycillin 400 mg is prescribed but amoxycillin is only available as 500 mg capsules, then most likely it is amoxycillin 500 mg that is required.

Generally, a wrongly written dosage form does not lead to serious consequences unless the strength or the frequency of use of that dosage form is also different. For example, the strength of paracetamol syrup is 120 mg per 5 ml while paracetamol suspension is 250 mg per 5 ml. Therefore, if the prescription for a one-year old child was written as “Paracetamol Suspension 5 ml 6 hourly”, the child would be given 250 mg of paracetamol per dose instead of 120 mg. The pharmacy staff may be aware of such error if the child’s age is stated on the prescription. However, if both tablet and capsule contained 500mg paracetamol and were given the same frequency, it would not cause any major problem if either dosage form were dispensed.

Another common error in dosage form is related to sustained-release (SR) tablets as also mentioned by other authors (19). Standard-release dosage forms are usually given as 6 hourly, whereas, the SR tablets are given as 12 hourly. For example, if ketoprofen is prescribed to be taken two times a day without the “SR”, the standard-release tablets of 50mg may be dispensed instead of the intended 200mg SR tablets, causing the patient to take an under dose.

The frequency of wrongly written dosage form could be under-reported as the error may not be detected even if the prescriber has written tablet instead of capsule or suspension instead of syrup if both the dosage forms are available. Information such as the unit strength of the drug required may help to identify this type of error. This further emphasizes the importance of writing a prescription with complete details.

Of the 39 drug-drug interactions identified in the present study, 15 could be classified as potentially hazardous but most of the consequences of interactions could be overcome with careful monitoring of the patients. However, the aim of reporting such drug-drug interactions is to bring awareness to the health care professionals so that appropriate precautions would be observed to minimize any adverse consequences.

CONCLUSION

The results of the present study show a low compliance rate to the legal and procedural requirements in prescription writing. This indicates a need for pharmacy and medical educators to further emphasize the importance of writing clear and complete prescriptions. It also calls for the implementation of educational and monitoring programmes to bring more awareness to all concerned so as to reduce the rate of noncompliance and hence minimize the occurrence of prescribing errors.

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REFERENCES