



## Prescription writing practices in a rural tertiary care hospital in Western Maharashtra, India

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### RESEARCH

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Please cite this paper as: Phalke VD, Phalke DB, Syed MMA, Mishra A, Sikchi S, Kalakoti P. Prescription writing practices in a rural tertiary care hospital in Western Maharashtra, India. AMJ 2011, 4, 1, 4-8

Doi: <http://dx.doi.org/10.4066/AMJ.2011.515>

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### Abstract

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#### Background

Prescription is a written order from physician to pharmacist which contains name of drug, its dose and its method of dispensing and advice over consuming it. The frequency of drug prescription errors is high. Prescribing error contributes significantly towards adverse drug events. The present study was undertaken to understand the current prescription writing practices and to detect the common errors in them at a tertiary health care centre situated in a rural area of Western Maharashtra, India.

#### Method

A cross sectional study was conducted at a tertiary level hospital located at a rural area of Maharashtra state, India during October 2009-March 2010. 499 prescriptions coming to medical store during period of one month were considered for data analysis. Important information regarding the patient, doctor, drug and the general description of the prescription were obtained.

#### Results

All the prescriptions were on the hospital pad. A significant number of the prescriptions (n=88, 17.6%) were written in illegible handwriting and not easily readable. The name, age and sex of the patient were mentioned in majority of the prescriptions. All the prescriptions (100%) failed to demonstrate the presence of address, height and weight of

the patient. Only the brand name of the drugs was mentioned in all the prescriptions with none of them having the generic name. The strength, quantity and route of administration of the drug were found on 73.1%, 65.3% and 75.2% prescriptions.

#### Conclusion

There are widespread errors in prescription writing by the doctors. Educational intervention programs and use of computer can substantially contribute in the lowering of such errors. A short course on prescription writing before the medical student enters the clinical field and strict monitoring by the administrative authorities may also help alleviate the problem.

Word count: 2980

Tables: 2

#### Key Words

Prescription, error, tertiary care hospital

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#### Background

Prescription is a written order from physician to pharmacist which contains name of drug, its dose and its method of dispensing and advice over consuming it<sup>1</sup>. The prescriber is not always a doctor but can also be a paramedical worker, such as a medical assistant, a midwife or a nurse. The dispenser is not always a pharmacist, but can be a pharmacy technician, an assistant or a nurse. Every country has its own standards for the minimum information required for a prescription, and its own laws and regulations to define which drugs require a prescription and who is entitled to write it. In many countries the validity of a prescription has no time limit, but in some countries pharmacists do not give out drugs on prescriptions older than three to six months. In India there is no time limit for its validity but one prescription is valid for one purchase of and dispensing of one set of drugs prescribed for the patients. The importance of the prescription is exaggerated by the fact that it becomes a medico legal document once it is signed by the prescribing authority, and thus must be written completely and legibly<sup>2</sup>.

The frequency of drug prescription errors is high<sup>3</sup>. Prescribing and administering errors are the two most frequent types of medication errors<sup>4</sup>. The reported



frequency of prescription errors varies between 39%<sup>5</sup> and 74% of all medication errors<sup>6</sup> in specific settings. A survey from Italy had revealed that 1 in 4 prescriptions were not fully completed or were illegible<sup>3</sup>. Overall 23.9% of prescriptions were illegible and 29.9% of prescriptions were incomplete<sup>3</sup>. A similar survey from a Portuguese hospital had an estimated 3.3 errors per prescription order form<sup>7</sup>. Even advanced nations like UK had reported 15% of the prescription to be containing one or more errors in critical care units<sup>8</sup>. A study of prescriptions dispensed to elderly patients at a primary health care centre in Mexico found high potential prescription error (53% of total prescriptions)<sup>9</sup>. Most of the prescription errors were due to omissions of dosage, administration route, and length of treatment and may potentially cause harm to the elderly outpatients. The prescribing errors could be broadly classified into two types—errors in decision making and errors in prescription writing<sup>10</sup>. The causes of errors can be classified in three major categories: non vigilance caused by stress, lack of appropriate routines or violation of them, and lack of appropriate skills/negligence<sup>11</sup>. Some of these errors could be minor, while a few of them may prove fatal. Prescribing error contributes significantly towards adverse drug events (ADE)<sup>12</sup>. However, many of these errors are preventable.

A comprehensive study to report the lacunae in the prescription writing trends from Indian hospitals and among physicians have been lacking. The present study was undertaken to understand the current prescription writing practices and to detect the common errors in them at a tertiary health care centre situated in a rural area of western Maharashtra, India. The results of the survey could help the management of the hospital to allow better planning and monitoring facilities at the institution. The results can also be used to form a base to provide technical know how about prescription writing to the prescribing doctors.

**Method**

A cross sectional study was conducted at a tertiary level hospital located at a rural area of Maharashtra state, India during October 2009-March 2010. A set of about twenty outpatient prescriptions coming to the medical store of the hospital for obtaining drugs were randomly selected and analyzed. This exercise was carried during the working days for a period of month. The data was entered into a pre tested *pro forma*. The questionnaire in the *pro forma* had four parts. Important information regarding the patient, doctor, drug and the general description of the prescription were obtained in these four sections separately. Patient information that was sought included the name, age, sex, height, weight and address. The prescriptions were further checked for the following details of the prescribing authority: name, seal, qualification, designation, complete address, phone number, signature and registration number of the doctor. The drug name, dose, frequency and route of administration, instructions and advice to patient, follow up requirements about the drug were also tabulated. The overall clarity, readability, use of prescription pad, presence of date was included in a separate section of the data sheet.

The prescription was considered “unreadable”, if none of the two investigators at the medical store appointed for data collection and the pharmacist could not read one or more drug name or dose. The anonymity of the patients and the doctors were strictly maintained. Statistical software StatistiXL and Microsoft Excel were used for data analysis. The ethical approval was obtained from the Institutional Ethical Committee of the teaching hospital. The WHO guideline<sup>2</sup> for prescription writing has been taken as standard while making an assessment of the results.

**Results**

The medical store of the hospital receives an average of 518 outpatient prescriptions daily. During the study period 499 prescriptions coming to medical store were considered for data analysis. Important information regarding the patient, doctor, drug and the general description of the prescription were obtained. All the prescriptions were on the hospital pad. Date of consultation was eligibly written on 472 (94.6%) prescriptions. The date and case file number were missing on 27 (5.4%) and 118 (23.6%) prescriptions respectively. A significant number of the prescriptions (n=88, 17.6%) were written in illegible handwriting and not easily readable. Prescribing department was only found mentioned in 401 (80.4%) prescriptions.

The name, age and sex of the patient were mentioned in majority of the prescriptions (Table 1). All the prescriptions (100%) failed to demonstrate the presence of address, height and weight of the patient. The name, qualification and designation of the doctor were seen in 76.7%, 49.5% and 75.4% prescriptions respectively. The address, telephone and registration number of the doctor was found missing in about three fourth of the prescriptions (Table 1). More than one tenth (12%) of the scrutinized documents lacked the signature of the prescribing authority.

**Table 1: Analysis of patient and prescriber/doctor information on the prescription**

	Yes	No
<b>Patient</b>		
Name	484 (97)	15 (3)
Age	444 (89)	55 (11)
Sex	449 (90)	50 (10)
Address	0 (0)	499 (100)
Weight	0 (0)	499 (100)
Height	0 (0)	499 (100)
<b>Prescriber/Doctor</b>		
Name	383 (76.7)	116 (23.3)
Qualification	247 (49.5)	252 (50.5)
Designation	376 (75.4)	123 (24.6)
Address	109 (21.8)	390 (78.2)
Telephone number	52 (10.4)	447 (89.6)
Signature	439 (88)	60 (12)
Registration number	130 (26.1)	369 (73.9)

Data in the parenthesis indicates percentage.

Only the brand name of the drugs was mentioned in all the



prescriptions with none of them having the generic name. The strength, quantity and route of administration of the drug were found on 73.1%, 65.3% and 75.2% prescriptions. Regarding the dose of the drug, it was clearly written on only 64.9% prescriptions while it was correct and calculated only in 45.7% of total prescriptions. Any advice for follow up was missing in all the prescriptions (Table 2).

Table 2: Analysis of drug information on the prescription		
	Yes	No
Name		
Brand	499 (100)	0 (0)
Generic	0 (0)	0 (0)
Mixed	0 (0)	0 (0)
Strength	365 (73.1)	134 (26.8)
Dose		
Clearly mentioned	324 (64.9)	175 (35.1)
Correct & calculated	228 (45.7)	271 (54.3)
Quantity	326 (65.3)	173 (34.7)
Route of administration	375 (75.2)	124 (24.7)
Duration	368 (73.7)	131 (26.2)
Instruction for patients	270 (54.1)	229 (45.9)
Advice for follow up	0 (0)	499 (100)
Data in the parenthesis indicates percentage.		

### Discussion

We found all the prescription to be on the prescription pad of the hospital. This was because of the fact that the medical store of the hospital only accepts order for dispensing drugs on the prescriptions pad of the hospital. No drug is issued on plain paper even if it is signed by the doctor. The date of issuing the prescription was missing in 5.4% of the prescriptions which was much lower than the outpatient prescription of a central hospital of Saudi Arabia, where this important piece of information was missing in 64.3% of them<sup>13</sup>. A survey from an Italian hospital also did not reveal a healthy trend, as 56.1% of their prescription for antibiotics lacked the date<sup>3</sup>. Illegible handwriting in the prescription may be source of fatal consequences<sup>14</sup> and a leading cause of medication error<sup>15</sup>. This problem was encountered in 17.6% of the prescriptions in our study which was comparatively higher as suggested by studies in US (10%)<sup>16</sup> and UK (15%)<sup>17</sup>. Heavy workload is one of the common reasons offered by doctors for poor handwriting<sup>18</sup>. Educational interventions were found effective to address the problem<sup>16,18</sup>.

The presence of name of the patient in 97% of the prescriptions corresponds to the findings of Y.M. Irshaid et al<sup>13</sup> who also found 94.6% of their prescriptions complete with name. However the mention of the age (89%) and sex (90%) of the patient in the prescription were much higher for our survey while it was only 77.2% and 51.3% in the above said study. The absence of address and weight of the patient in all the prescription was an indication of poor prescription writing trend. The results were similar to the findings of Y.M. Irshaid et al. Patient's address is important in a way that it tells us about region from where he/she

comes. It is also important to decide when patient to be called for follow up or whether he can be called from distance. Weight of the patient assumes significance because of the fact that it determines the actual quantity of the drug per dose. A pharmacist may not dispense the drug in correct amount if the weight of the patient is missing.

There were large numbers of deficiencies in the information regarding the prescriber. 23.3% prescriptions did not bear the name while more than 50% did not mention the qualification. Designation was not present in 24.6% prescriptions and address of the doctor was not available in 78.2%. Majority of the prescriptions lacked the telephone number of the doctor. The lacunae in dispensing these informations were a violation of WHO guidelines on prescription writing<sup>2</sup>. Doctor's complete address is important part of prescription especially for family, so that in case of emergency he can be contacted. Not having mentioned qualification of the prescriber raises question about his/her authority to prescribe medicine. A stamp may play the role of providing name, qualification, designation and address along with telephone number of the doctor. However the use of stamp was seen only in 76% of prescriptions. Even some of the stamps did not provide the necessary information like qualification, telephone and registration number. In India, it is important to mention the registration number in each prescription. The lack of the display of registration number is considered a serious negligence on the part of the doctor. Our study revealed a poor knowledge of this aspect of medical profession as about 74% prescriptions had no information about the registration number of the doctor. The study from Saudi Arabia revealed 16.7% of prescriptions deficient in the prescriber name and 18.1% deficient in the prescriber signature<sup>13</sup>. These findings were certainly lower than our results. Anderson and Beurling<sup>19</sup> from Copenhagen University Hospital reported that among the most frequent errors of omission in prescriptions was inadequate identification of the physician.

None of the doctors wrote the generic name of the drug. Most certainly, this practice gives an advantage to the pharmacist to dispense the cheapest drug or the one which is available. Y.M. Irshaid et al<sup>13</sup> found that only 15% of the prescriptions mentioned the generic name. Anuja A Pandey et al<sup>20</sup> found only 7.4% of paediatric outpatient prescriptions from Pune had clearly mentioned generic name while use of brand name was a universal practice. The dose of the drug was missing in about 35% of prescriptions, a figure corresponding to the findings of Khaja et al<sup>21</sup> in Bahrain. B Dean et al<sup>22</sup> found dose related errors to be the most common error in prescription writing. A large scale study from Texas, US also found drug dosage to be the most inconsistent element in prescription<sup>23</sup> in both control and study group. The strength, route of administration, quantity and duration were missing in more than 25% of prescriptions. Such lacunae may lead to inappropriate dispensing of the drug by pharmacists. Y.M. Irshaid et al<sup>13</sup> revealed that 94% of the prescriptions overviewed by them had not mentioned the quantity of the drug, strength of



drug was lacking in more than 50% while 90.7% had only partial instructions for the patient. Certainly these findings are in contrast with our study. Only just more than half of the prescriptions had instructions for the patient while there was no advice for follow up in any of them.

Various studies have suggested a computer based system for prescription writing<sup>17, 24</sup>. Bizovi et al<sup>25</sup> concluded from their study that computer-assisted prescriptions were more than three times less likely to contain errors and five times less likely to require pharmacist clarification than handwritten prescriptions. Educational training programmes have also yielded significant positive changes in the prescription writing behaviour of the doctors<sup>16, 18, 26</sup>. We also recommend the use of printed prescription formats where spaces for patient's weight, address, prescriber's phone number and qualification are more emphasized.

### Conclusion

There are widespread errors in prescription writing by the doctors. The lack of doctor's qualification, patient's weight, correct and calculated dose were the most critical areas in terms of prescription completeness, all were absent in about 50% of the prescriptions. Educational intervention programs and computer aided prescription order entry can substantially contribute in the lowering of such errors. Since some of these errors lead to serious consequences, long term and effective remedy is needed. A short course on prescription writing before the medical student enters the clinical field and strict monitoring by the administrative authorities may also help alleviate the problem.

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#### **PEER REVIEW**

Not commissioned. Externally peer reviewed.

#### **CONFLICTS OF INTEREST**

The authors declare that they have no competing interests.

#### **FUNDING**

Source of funding: None