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Research Article

AN ANALYSIS OF THE NATURE AND MAGNITUDE OF TRANSCRIPTION ERRORS IN MEDICINE WARDS OF A TERTIARY CARE HOSPITAL

Malcolm Silva and Padmanabh V. Rataboli

Department of Pharmacology, Goa Medical College, Goa, India

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ABSTRACT

***Background*:** Medication errors can result at any step of medication use process. Transcription is the process of transfer of information from the order sheet to the nurse's documentation form or medication administration record. Any deviation during the transfer of information from the order sheet to the nurse's documentation form or medication administration record results in a transcription error. The present study was conducted to analyse the nature and magnitude of transcription errors in medicine wards of a tertiary care hospital.

***Material and Methods*:** The present study was a prospective observational hospital based study, carried out among inpatients admitted in medicine wards of a tertiary care hospital in Goa during a period of 3 months.

***Results*:** A total of 500 patient observations were made, out of these 169 (33.8%) instances of transcription errors were detected. Majority of transcription errors 137 (27.4%) were of the 'incomplete order(s) error category.

***Conclusion*:** Our study is the first of its kind in the state of Goa and our findings are quite alarming. Missed orders can cause alarming harm to a patient if the newly added drug or drug not entered is an important drug to modify the health scenario of a patient. Each hospital should form its own 'Standard operating procedures' for the nurses to follow and thereby minimise the instances of transcription errors.

INTRODUCTION

A medication can mean either a process or an object that undergoes the process.[1]In health care settings, patient safety is of utmost importance.[2]This can be achieved by proper use of medications ordered by the treating doctor. Medication use process involves various steps like prescription, transcription, dispensing and administration. Medication errors can result at any step of medication use process.[3]Transcription is the process of transfer of information from the order sheet to the nurse's documentation form or medication administration record.[4]

According to United States National Coordinating Council for Medication Error Reporting and Prevention, "any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional, patient, or consumer.[5] In the US each year about 7,000 - 9,000 people die as a result of medication errors. Medication errors can be classified in different ways, one of which is errors at each step of medication use process i.e. prescription errors, transcription errors, dispensing errors and administration errors.[6] In USA according to the Institute of Medicine "on an average an inpatient is subjected to at least 1 medication error per day".[7]

Transcription error is any discrepancy between the prescribed medications and that entered into the nurse's record.[8] According to an Indonesian study, transcription errors were highly influenced by hospital documentation.[9]Transcription errors may at times go unnoticed or undetected and may be insignificant to cause any harm to the patients. On the other hand they may be significant and burden the institute both clinically and economically.[10]

Transcription errors were categorised into different error types based on the following deviations or discrepancies in normal transcribing process which are as follows:

- Dose (Wrongly transcribed)
- Omission of an order(s)
- Missing new order(s)
- Not transcribed stop order(s)
- Incomplete order(s)
- Duplicate entry order(s)

Corresponding author:* **Malcolm Silva
Department of Pharmacology, Goa Medical College, Goa, India

Our study was focussed on analysing transcription errors which contribute to significant portion of medication errors in day to day medical practice. There is limited data of studies done on transcription errors occurring in isolation in hospital settings and in Indian healthcare scenario. Hence the study was conducted to analyse the nature and magnitude of transcription errors in our Institute.

MATERIALS AND METHODS

A prospective observational study was conducted with 500 case record sheets of patients admitted in medicine wards of a tertiary care hospital in Goa during the study period of 3 months after approval from Institutional Ethics Committee. The treating doctor's prescribed orders for a particular patient are transcribed by the nurse's on their medication administration record (log book). The doctor's orders and nursing treatment book records for every admitted patient during the study period were noted. Subsequently the doctor's orders were compared with the orders transcribed in the nurses log book and analysed for possible errors of transcription. Transcription errors were defined as any deviation in the process of transcribing doctor's medication orders by the nurse.

Data Evaluation and Analysis

Data was analysed using Microsoft Excel sheet 2010. The errors were categorised based on the type of errors as described earlier. The proportion and frequency of transcription errors per prescription and the overall transcription error rate was recorded.

RESULTS

A total of 500 case record sheets of patients from medicine wards were compared with the nurses transcribed orders for the same patients at that particular shift during the study period. The total number of transcription errors recorded were 169 (33.8%) during the observation in medicine wards.

The proportion and frequency of transcription errors were noted and categorised as shown in table 1

Table 1 Showing proportion and frequency of various transcription error types

Sr. No.	Transcription error type	Proportion/ Frequency
1)	Dose wrongly transcribed	2 (0.6%)
2)	Omission of an order	7 (1.4%)
3)	Missing new orders	16 (3.2%)
4)	Not transcribed stop orders	5 (1%)
5)	Incomplete orders	137 (27.4%)
6)	Duplicate entry orders	2 (0.4%)

Examples of transcription errors in each category

Dose wrongly transcribed: The following orders were wrongly transcribed in the nurses log book.

1. Inj. Gentamicin 150mg IV diluted od ATD was transcribed as Inj. Gentamicin 120mg IV diluted od ATD
2. Inj. Coamoxyclav 1.2gm IV 8hrly transcribed as Inj. Coamoxyclav 1.5gm IV 8hrly

Omission of an order(s): The following orders were not entered in the nurse's log book.

1. Tab. Aspirin 150mg od
2. Tab. Pantoprazole 40mg od
3. Syrup Bromhexine 2tsp tds
4. Tab. Tamsulosin 0.5mg od hs
5. Tab. Amlodipine 5mg bd
6. Condys gargles tds
7. Neotonic enema hs

Missing new order(s): *The* following were newly added in the doctor's orders but were missed by the nurses during transcription.

1. Inj. Methylprednisolone 40mg IV od
2. Tab.Paracetamol 500mg bd
3. Tab. Metformin 500mg od
4. Tab. Atorvastatin 10mg hs
5. Tab. Levothyroxine 25µg od
6. Tab. Furosemide 40mg od
7. 10oz Potassium chloride solution od

Not transcribed stop order(s): The following orders were omitted in the doctor's orders but they did not reflect as cancelled in the nursing log book.

1. Inj. Ceftriaxone 1gm IV 12hrly
2. Inj. Mannitol IV 8hrly
3. Inj. Methylprednisolone 40mg IV od
4. Tab. Aspirin 150mg od
5. Inj. Enoxaparin 0.6mg SC od

Duplicate entry order(s): In two instances we came across double entries of orders for a particular patient which are as follows,

1. Inj. Pantoprazole 40mg IV od was transcribed twice
2. Tab. Tamsulosin 0.4mg od was transcribed twice

Incomplete order(s): As many as 136 (27.2%) orders were incompletely transcribed. In most of them the route was not mentioned table 2 enumerates some of them.

Table 2 Enumerates examples of incompletely transcribed orders

Sr. No	Error type	Prescription (Resident doctors orders)	Error (transcribed as) by nurses on the log book
1)	Not transcribed dose: 25 (4.6%)	• Inj. Enoxaparin 0.6mg SC od • Inj. Ondansetron 4mg IV 8 hrly • Tab. Aspirin 150mg od • Tab. Clopidogrel 75mg od hs	• Inj. Enoxaparin ? SC od • Inj. Ondansetron ? IV 8 hrly • Tab. Aspirin ? od • Tab. Clopidogrel ? od hs
2)	Not transcribed route:109 (21.8%)	• Inj. Enoxaparin 0.6mg SC od • Inj. Cefoperazone + Sulbactum 1.5gm IV 12hrly • Inj. Pantoprazole 40mg IV od	• Inj. Enoxaparin 0.6mg ? od • Inj. Cefoperazone + Sulbactum1.5gm ? 12hrly • Inj. Pantoprazole 40mg ?od
3)	Not transcribed frequency:3(0.6%)	• Tab. Clopidogrel 75mg od hs • Tab. Ramipril 2.5mg bd • Tab. Pantoprazole 40mg od	• Tab. Clopidogrel75mg ?hs • Tab. Ramipril2.5mg ? • Tab. Pantoprazole 40mg ?

DISSCUSSION

Medication errors worldwide are a major cause of preventable mortality, more prevalent in hospital settings and can result in increased costs, prolonged hospital stay or even life threatening harm. Different types of medication errors like prescription errors, transcribing errors, dispensing errors and administration errors have been reported by various studies. Indian studies on medication errors reported error rates ranging from 7.6% to 44%.[8]Transcription is defined as the transfer of information from an order sheet to nursing documentation forms, which is a potential source of many medication errors.

Factors contributing to transcribing errors include incomplete or illegible doctor's orders, incomplete or illegible nurse's handwriting, use of abbreviations and lack of familiarity with drug names along with errors associated with transcribing the drug name, dose, route or frequency etc.[4]

In our study, we studied 500 case record sheets of admitted patients for transcription errors during 3 months period. A total number of 169(33.8%) transcription errors were recorded. This observation is in line with the findings of Ernavati et al (2014) who recorded 35.2% transcription errors.[9]Hartel et al (2011) reported 53% transcription errors in a study conducted in a South-Indian tertiary care hospital.[11] In contrast, Mohsenzade et al (2010) reported 10% transcription errors in a study conducted in paediatric population.[12] High rates of transcription errors is alarming and talks volumes of damage analysis to be done and the need to put procedures in order.

Incomplete orders form the bulk (27.4%) of transcription errors in our study. More than one-fifth (21.8%) of these were 'Route of administration' not transcribed in the nurse's log book. Although many of these are not harmful as the standard 'route' of these drugs are well established, yet a newly appointed nurse who is not well experienced can administer the drug by a route of her choice, if it is not clearly mentioned. Injection enoxaparin 0.6mg SC can as well be administered IM by a nurse who is not very experienced; Injection pantoprazole may be given IM instead of IV. Thus it is essential to transcribe the orders 'in toto'.

In 25 case record sheets the dose was not transcribed. In case of drugs where multiple doses are available this can be a problem. Tablet aspirin 150mg od was written as tablet aspirin od. It can be interpreted as 75mg, 150mg or 325mg by the nurse who administers the drug to the patient. Similarly injection ondansetron could be administered in the dose of 8mg instead of 4mg if not specified correctly.

In 3 case record sheets the frequency was not mentioned in the nurse's log book. Although in case of pantoprazole, od is the standard frequency, in case of ramipril it could be od or bd.

In admitted patients, during consultant rounds often new orders are issued and written on the case papers for further compliance. If the transcription process is completed much before the rounds, nurses on duty may be lazy enough not to go through the whole lot of case papers in a busy ward and new orders can be missed. These include significant additions like injection methylprednisolone, tablet furosemide, tablet levothyroxine and tablet metformin. Similarly, in 7 case record sheets, orders from doctor's prescription lists were missed while transcribing (omission of an order). These included important drugs like aspirin, amlodipine, pantoprazole and tamsulosin. In many cases, omission of a dose, either regular or a new one may have an important impact on the outcome of the patient prognosis and response to treatment. Contributing factors may include too many patients in the ward, too many drugs per patient, lack of staff, transcription delays after rounds and distractions by patients or their relatives.

Often drugs in the doctors list are omitted during rounds and these drugs need to be stopped immediately. We came across 5 instances where drugs omitted still reflected in the nurse's book. These included injection ceftriaxone, injection enoxaparin, injection mannitol and injection methylprednisolone. Additional doses of these drugs when not required can cause toxicity and add to the financial burden of the paid patients.

In our study, we came across two cases (0.6%) where wrong dose was transcribed. Injection gentamicin 150mg dose was transcribed as 120mg (lower than the actual one) whereas injection coamoxyclav 1.2gm dose was transcribed as 1.5gm (higher than the actual one).

This is in line with (1%) cases of wrong doses observed by Mathaiyan et al (2016) in their South-Indian study.[8] Correct transcription of drug doses is of utmost importance in health care. Higher doses can cause toxicity whereas lower doses can cause failure. Cross checking of transcriptions can be done specially in situations where too many patients or too many drugs can pose a risk of errors.

There were double entries seen in 2 cases. This can be hazardous if the drug in question is of low therapeutic index. In our study the drugs in question were pantoprazole and tamsulosin which if given twice may not cause significant harm. Ours being a government hospital where patients receive treatment free of cost and with big patient burden to cater to, errors are bound to occur. There are no cross checking mechanisms in place in busy wards and often just 1-2 nurses look after a ward admitting 30- 40 patients.

The results of our study highlight the need to adopt standard operating procedures in every ward which the nursing should adhere to during the process of transcription and thus help minimise the errors. Illegible handwriting by the resident doctors who make entries in the case papers can pose a serious problem in case of look-alike or sound-alike drug names. The doctors should write legibly so that the possible transcription errors are prevented.

Nurses should refrain from getting distracted by use of mobile or picking phone calls while transcribing the doctor's orders. Interruptions in this process can lead to errors of omission, double entries or entry of wrong dose.

Our study is the first of its kind in the state of Goa and our findings are quite alarming if not highly significant. Fortunately we didn't come across a single 'unauthorised medication' transcribed. Unauthorised medication is the one which is not found in physician's orders.

In comparison, a study by Fahimi et al (2009) found 16% unauthorized entries, 52% omissions and 18% wrong doses.[13] Our transcription process is much better; however it needs a thorough analysis to make it 'error-free' to the best extent possible.

CONCLUSION

The objectives of our study were to analyse the transcription errors in medicine wards of a tertiary care hospital with vast burden of patients and big medication orders. Although the analysis reveals 33.8% errors, most of them are incomplete orders which are factually insignificant as far as potential harm is concerned as the doses and routes of the medicines prescribed were well known. However, 'missed orders' can cause alarming harm to a patient if the newly added drug or drug not entered is an important drug to modify the health scenario of a patient. Each hospital should form its own 'Standard operating procedures' for the nurses to follow and thereby minimise the instances of transcription errors.

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