
Brief Report

Transcription Errors Observed in a Teaching Hospital

Fanak Fahimi Pharm D, BCPS^{***}, Mohammad Abbasi Nazari Pharm D, BCPS^{*},
Ramin Abrishami Pharm D^{***}, Mohammad Sistanizad Pharm D^{*}, Talya Mazidi Pharm D^{***},
Toktam Faghihi Pharm D^{***}, Rasoul Soltani Pharm D[†], Shadi Baniasadi Pharm D, PhD^{**}

Medication errors are among the most common medical errors in the hospitals. Transcription error is a specific type of medication errors and is due to data entry error that is commonly made by the human operators. This study was designed to detect transcription errors in a teaching hospital in Tehran.

Direct observational method was used in this study. Error was defined as any deviation in transcribing medication order from the previous step (order on the order sheet, administration nursing note and/or cardex, documentation of the order in the pharmacy database).

A total of 287 charts with 558 opportunities for error were reviewed. Of those opportunities for error 167 (29.9%) resulted in an error. Omission (the patient did not receive the medication that was ordered) was the highest (52%) transcription error type seen in this study.

The evaluation clearly showed that errors at transcription stage were not infrequent. To cut these errors down we suggest implementation of surveillance systems, which might help to decrease medication errors.

Archives of Iranian Medicine, Volume 12, Number 2, 2009: 173 – 175.

Keywords: Medication error • patient chart • physician order • transcription error

Introduction

Medication errors are well-known problems in the hospitals. Medication error is defined as “any preventable event that may cause or lead to an inappropriate medication use or patient harm while in the control of the health care professional, patient or consumer.¹” Studies have shown that medication errors and adverse drug reactions are the main causes of adverse events in hospitals leading to morbidity and mortality in up to 6.5% of hospital

admissions.^{2,3}

In a study, Bates et al. reported the frequency of medication errors as 5.3 per 100 orders.⁴ Another study from 36 hospitals in the USA showed that 19% of administrations contained at least one error.⁵ Each error can result in an estimated cost of \$5000, excluding legal expenses.⁶ Less is known about the medication errors in other parts of the world,⁷ including the Middle East.

Errors in the medication process can occur in any stage including: ordering, transcription, dispensing, and administration.⁸ Medication errors are classified as prescription, transcription, administration, dispensing,⁹ and discharge summaries. Transcription errors are defined as an identical copy of prescription in the medical records. In one study this class of medication errors was categorized as discrepancy in drug name, drug formulation, route, dose, dosing regimen, omission of drug, drugs which were not ordered.⁸

Several sheets of paper and stages from physician's order to drug delivery may cause confusion and add to the possibility of

Authors' affiliations: * Clinical Pharmacy Department, School of Pharmacy, Shahid Beheshti University, M.C., **Pharmaceutical Care Department, TB and Lung Disease Research Center, NRITLD, Masih Daneshvari Hospital, Shahid Beheshti University, M.C., *** Clinical Pharmacy Department, School of Pharmacy, Tehran University of Medical Sciences, Tehran, † Clinical Pharmacy Department, School of Pharmacy, Isfahan University of Medical Sciences, Iran.

Corresponding author and reprints: Mohammad Abbasi Nazari Pharm D, Department of Clinical Pharmacy, School of Pharmacy, Shahid Beheshti University, M.C. Vali-e-Asr Ave., Niayesh Junction, Tehran, Iran. P.O. Box: 14155-6153
Tel: +98-218-887-3704, Fax: +98-218-887-3704
E-mail: Farshadpharm@yahoo.com

Accepted for publication: 8 October 2008

transcription errors.

Since no valid or detailed hospital based incident reporting system exists in our institution, the current study was designed to detect the transcription errors in this setting as part of the medication safety surveillance.

Patients and Methods

Direct observation was used to detect medication errors. The study was conducted during April to August 2004 in different wards of a teaching hospital affiliated to Shahid Beheshti University, M.C., Tehran, Iran. The mean number of dispensing in pharmacy of the hospital was 200 prescriptions per day during the study period.

Prescriptions are either transferred to the hospital pharmacy or dispensed from ward-based stocks. When prescriptions are sent to the pharmacy they are transcribed into the pharmacy information system. The pharmacy then fills, checks, and dispatches the medications to the ward.

Details of randomly selected orders in the chart, nursing notes, and prescriptions were prospectively recorded by an investigator. The process included review of each medication order on the order sheet, its transcription, administration nursing note and/or cardex, and documentation of its prescription using pharmacy database.

Throughout the medication process, the clinician writes medication order on a medicine chart.

Error was defined as any deviation in transcribing medication order from the previous step. If there was a difference, the error was described and categorized. The errors were categorized on the basis of their types, which best represented the data. Categories were omissions, wrong dose or interval, requesting drug more than the patient's need, alternative drug, and

unauthorized medication. Definition of each error is presented in Table 1. Opportunities for error were calculated by number of drugs multiplied by number of charts reviewed.

Data were analyzed using Microsoft® Office Excel 2003.

Results

A total of 287 charts were reviewed. There were 558 opportunities for error. Of the total opportunities for error 289 (51.8%) resulted in an error. The average error detected was calculated as one per chart.

Figure 1 shows the distribution of the type of transcription errors.

Omission was rated as the highest (52%) transcription error found in this investigation.

Discussion

A high incidence of transcription errors was found in this investigation. The samples were taken from a major teaching hospital and included a range of patients and wards, physicians, nurses, pharmacy staff, drugs, and administration times. We did not assess the severity of transcription errors.

Transcription-related errors were 72.4 per month in Loyola University, USA, using a manual entry system of the orders, which was then reduced to 2.2 per month after implementing computerized provider order entry.¹⁰ Another study in Spain showed that the rate of errors in treatment orders using the manual prescribing system was 14.4 versus 1.3% following the implementation of the electronic system.¹¹

Previous studies have suggested a need for a medication system to eliminate errors at transcription stage.^{4,8}

Our plan was to explore whether administration

Table 1. Definition of different categories of errors in the study.

Type of medication error	Definition
Omission	When prescribed medication(s) by the physician was not reached to the patient.
Wrong dose/ interval	When the dose and/or interval, etc prescribed by the physician were not reached to the patient correctly.
Requesting drug more than required	Requests from the pharmacy more than required according to the physician's order.
Alternative drug	Medications that were replaced by another medication by the pharmacy without physician's approval.
Unauthorized medication	Those medications that were administered but could not be found in physician's order.

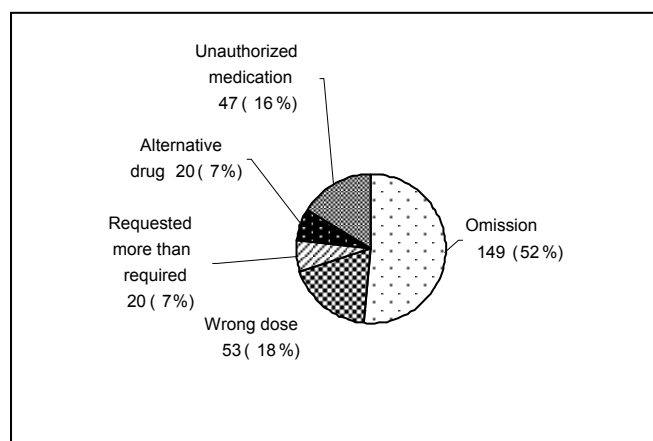


Figure 1. Distribution of the type of transcription error seen during the study.

of drugs were concordant with physicians' orders in the medication charts in terms of drug name, dosage form, dose, time and route of administration.

In our study the most common error type was omitted doses (52%). This was similar to a study performed by Lisby et al. who found omitted doses as the most common errors at the dispensing (5/5) and ordering (144/167) stage.⁸ It is possible that the unavailability of some drugs, which have not been ruled out in our study has aggravated the problem.

Furthermore, we found that 47 (16%) errors were due to administering drug without any order in the chart or any verbal order that should be documented in the chart.

This study is not devoid of limitations. The study was conducted in one hospital so the results couldn't be extrapolated to other institutions.

Our study clearly revealed that errors at transcription stage were not uncommon. To reduce the rate of the medication errors, we suggest implementation of proper tracking systems to build a safer and more precise drug delivery system in the hospitals. Also, in order to find the multiple factors that may cause an error to happen a stepwise supervision and evaluation system should be encouraged. Introduction of a punishment-free system to collect and record information about medication errors and dedication of more resources to drug safety programs in the hospitals are also recommended.

Acknowledgements

The assistance of Dr. Jamshid Salamzadeh in the preparation of the manuscript is highly appreciated.

References

- Ross LM, Wallace J, Paton JY. Medication errors in a paediatric teaching hospital in the UK: five years operational experience. *Arch Dis Child.* 2000; **83**: 492 – 497.
- Bates DW, Leape LL, Cullen DJ, Laird N, Petersen LA, Teich JM, et al. Incidence of adverse drug events and potential adverse drug events. Implications for prevention. ADE Prevention Study Group. *J Am Med Assoc.* 1995; **247**: 29 – 34.
- Brennan TA, Leape LL, Laird NM, Hebert L, Localio AR, Lawthers AG, et al. Incidence of adverse events and negligence in hospitalized patients. Results of the Harvard Medical Practice Study 1. *N Engl J Med.* 1991; **324**: 370 – 375.
- Bates DW, Boyle DL, Vander-Vliet MB, Schneider J, Leape L. Relationship between medication errors and adverse drug events. *J Gen Intern Med.* 1995; **10**: 199 – 205.
- Barker KN, Flynn EA, Pepper GA, Bates DW, Mikeal RL. Medication errors observed in 36 health care facilities. *Arch Intern Med.* 2002; **162**: 1897 – 1903.
- Bates DW, Spell N, Cullen DJ, Burdick E, Laird N, Petersen LA, et al. The costs of adverse drug events in hospitalized patients. *JAMA.* 1997; **277**: 307 – 311.
- Wilson RM, Runciman WB, Gibberd RW, Harrison BT, Newby L, Hamilton JD. The quality in Australian health care study. *Med J Aust.* 1995; **163**: 458 – 471.
- Lisby M, Nielsen LP, Mainz J. Errors in the medication process: frequency, type and potentiality. *J Qual Health Care.* 2005; **17**: 15 – 25.
- Grasso BC, Genest R, Jordan CW, Bates DW. Use of chart and record reviews to detect medication errors in a state psychiatric hospital. *Psychiatr Services.* 2003; **54**: 677 – 681.
- Barron WM, Reed RL, Forsythe S, Hecht D, Glen J, Murphy B, et al. Implementing computerized provider order entry with an existing clinical information system. *Jt Comm J Qual Patient Saf.* 2006; **32**: 506 – 516.
- Delgado Silveira E, Soler Vigil M, Pérez Menéndez-Conde C, Delgado Téllez de Cepeda L, Bermejo Viñedo T. Prescription errors after the implementation of an electronic prescribing system [in Spanish]. *Farm Hosp.* 2007; **31**: 223 – 230.