Medicine and Public Health Juornal, Volume 1, Issue 3, March 2014
ISSN 2345-5144

The Medical Errors and Causes in the General Public Hospital, Southern Iran

Mohaddeseh Ghanbari Jahromi[1]*, Mohammad Khammarnia[2], Farnaz Haghayghi[3], Marzieh Eslahi[4], Arezo Saeed[5], Aziz Kassani[6]

Abstract: Introduction: Medical errors are one of the important factors in mortality and morbidity in world and impose a huge cost on the health system. The aim of this study was to determine of medical errors and reason in Jahrom Hospital. Methods: This study was a survey which conducted as descriptive in period of 10 month of 2013. All of the medical errors in period of 10 month and all nurses were studied. Standard checklist was used for collecting data of medical error documentations. Data entered in SPSS software (v16) and analyzed with descriptive statistic. Results: The results showed that 57.2 % of errors were medicine, nurses committed errors more than other groups. 29.6 % of the errors occurred in screen ward and 30.6 occurred in the morning shifts. Incorrect medical order was important reason of medicinal errors from nurses view point and 93% of nurses' believed that incomplete prescription was the important cause in medical error. Conclusions: Medical error is a challenge in hospitals. So the managers should reduce errors through improve physician prescription techniques, decrease nurses work load, increase numbers of nurses in crowded wards and improve personnel pharmaceutical knowledge.

Index Terms: Medical Errors, Hospital, Medicine.

1 Introduction

PATIENT'S safety is the most important responsibility of healthcare system (1). In other word the main goal of health system is health improvement. Medical mistakes are harmful to patient's health and safety (2). Medical team is prone to make medical mistake but if these mistakes are not prevented they may be harmful to patients (3). In all countries medical mistakes are threat to health care system but they can be prevented by improving health care system and medical team working condition (4). Medical mistakes take place in diagnosis, prescription, tests report, and… (5). According to a study medical mistake is the third cause of death in America (6). Duo to studies in Iran medical mistake was the main cause of patients complains. Causes of medical mistakes are carelessness, inappropriate medication and negligence (7). 3-17% of patients are harmed by medical mistakes (8). Medical mistakes are the most frequent mistakes of medical team. And they are harmful to patients (9). A study proved that drug mistakes lead to 30% of patient s' mortality or more than 6 months morbidity (21). Mortality expenses of drug mistakes is estimated 6/1-6/5 billion dollars. Most of expenses was due to inappropriate use of drug, giving and receiving inappropriate drug and drug adverse effects (22). Although drug mistakes take place but there is no exact statistics in Iran (10). Approximately 1/3 drug adverse effects are due to drug mistakes (11). Most of drug mistakes are related to physicians, nurses and pharmacist. Considering nurses main role in medication they are more probable to make drug mistake (12). Drug mistakes take place in preparing process, transfer and injection (13). The main causes of drug mistakes are wrong prescription, wrong time of taking drug, wrong medication method and giving one's drug to another patient (14). Neglecting drug mistakes will lead to increase in medication expenses and period of hospitalization (15). According to studies drug mistakes are the most medical mistakes in Sanandaj state hospitals (16). Karen indicates that carelessness, interruptions and loss of nurses are two main risk factors for drug mistakes (17). Concerning medical mistakes especially drug mistakes impact on patients, this study is conducted to investigate nurses' opinion about medical mistakes and causes of drug mistakes in Jahrom hospital. The aim was to find causes of medical mistakes to improve patient safety.

2 Method

This applied, descriptive-cross sectional research was conducted in Jahrom public hospital in the southern of Iran. Due to not access to data this study was carried out in a period of 10 months (Oct 2012- Jun 2013). In order to collect data researchers referred to hospital clinical rule department and

1. *BSc Student of Health Services Management, School of Management and Medical Information Science, Shiraz University of Medical Sciences, shiraz, Iran & Student Research Committee, Shiraz University of Medical Sciences. E-mail: ghanbari_m @sums.ac.ir*
2. *Health Promotion Research Center, Zahedan University of Medical Sciences, Zahedan, Iran. Corresponding author: Mohammad Khammarnia, Tel: 09364987158*
3. *BSc of Health Services Management, Jahrom hospital, Jahrom University of medical Sciences.*
4. *BSc Student of Public health, School of health and Nutrition, Shiraz University of medical Sciences, Shiraz, Iran & Student Research Committee, Shiraz University of Medical Sciences.*
5. *BSc Student of Public health, School of health and Nutrition, Shiraz University of medical Sciences, Shiraz, Iran & Student Research Committee, Shiraz University of Medical Sciences.*
6. *Prevention of Psychosocial Injuries Research Centre, Ilam University of Medical Sciences, Ilam, Iran.*

visited recorded medical mistakes files. Medical mistake check list was used for data collection. The check list was made up of 5 parts: type of mistake, year of mistake, the person who make mistake, department of mistake, the shift of mistake. Due to large numbers of drug mistakes the researcher used a check list to collect data about causes of drug mistakes. The check list included 18 questions. 16 questions about causes (yes= 1, no= 2 point). 2 questions about night shifts and shifts more than 8 hours. 144 nurses among 152 filled the check list (95% response). SPSS 21 and descriptive statistics were used to analyze data.

3 Results

Results showed that 152 errors occurred during 10 months. 60/5% (92 errors) in 2012 second semester and 39/4% (60 errors) in 2013. In Jahrom hospital the most frequent errors were drug errors 57/2% (87 errors), 46% (70 errors) of drug errors were wrong drug. After that wrong techniques, organizational mistakes, record mistakes, diagnostic and medication mistakes were most important error respectively. (Table 1).

TABLE 1
THE MEDICAL ERRORS FREQUENCY AND CAUSES IN PUBLIC HOSPITAL

Type of error	Frequency	Percent
Diagnostic	6	3/9
Therapy	2	1/3
Medicinal :	87	57/2
Wrong drug	70	46
Wrong dose	10	6/5
Wrong patient	3	1/9
Wrong way	3	1/9
drug Delete	1	0/6
Recording	8	5/2
organizational	10	6/5
Technique	39	25/6
Total	152	100

The Most of errors were related to nurses 58/5 %(89 errors) and physicians 36/5% (55 errors). The lowest numbers of mistakes were related to service personnel 5/1% (8 errors).
Among hospital departments the most errors were in screen department 29/6 %(45 errors). The lowest numbers of mistakes were in emergency department 0/6% (1 mistake). (Table 3).

TABLE 2
MEDICAL ERROR IN DEPARTMENTS OF PUBLIC HOSPITAL

departments	Frequency	Percent
GYN	13	8/5
Screen	45	29/6
Pharmacy	21	13/8
NICU	2	1/3
Internal	15	9/8
Infant	8	5/2
Radiology	3	1/9
Surgery	5	3/2
Laboratory	9	5/9
CCU	3	1/9
OB	19	12/5
ER	9	5/9
Total	152	100

Most of mistakes took place in morning shifts 36/5% (55 errors). After noon shifts 34/2 %(52 mistakes) and night shifts 29/6 % (45 errors).
During a month 80/6% nurses had lower than 5 night shifts and 91/7% had lower than 5 long shifts (more than 8 hours). 93/1% nurses believed incomplete drug order as the main cause of drug mistake and 48% believed other factors to be causes of drug mistakes. (Table 3)
According to a survey with medical team physicians bad hand writing and lack of interaction among nurses were believed to be other causes of drug mistakes.

TABLE 3
NURSES OPINION ABOUT CAUSES OF DRUG MISTAKES IN PUBLIC HOSPITAL

Component	Yes		NO		
	Frequency	percent	Frequency	percent	Ranking
Incorrect medication order	134	93/1	10	6/9	1
Similarity of drug form or name	133	92/4	11	7/6	2
Inattention in reading order or doing order	133	92/4	11	7/6	2
Lack of nurse than number of patient	133	92/4	11	7/6	2
Lack of personnel awareness	132	91/7	11	7/6	3
Being a novice doctor or nurse	130	90/3	14	9/7	4
Disregard of caution in drug prescription	127	88/2	17	11/8	5
Long-term shifts	124	86/1	20	13/9	6
Miscalculation of drug dose	123	85/4	21	14/6	7
The lack of accurate records of actions taken	121	84	23	16	8
Attendance along and crowded ward	83	23/3	24	16/7	9
Environmental inappropriate terms	97	67/4	47	32/6	10
Lack of correct communication with patients	94	65/3	50	34/7	11
Night work	86	59/7	58	40/3	12
Equipment Malfunction	84	58/3	60	41/7	13

4 DISCUSSION

152 medical mistakes were recorded during 10 months. Most of mistakes were wrong drug. According to studies most of drug mistakes were wrong drugs. It confirms present study (18). Mohammadnejad study showed that the most frequent drug mistakes as nurses reported included wrong drug, wrong amount of drug and infusion speed. Dean indicates the most common nurses' drug mistakes in Britain are drug omission and wrong dose (19). Rigy study proved that most of drug mistakes included wrong time of giving drug and forgetting prescribed drug (20). According to another study the most drug mistakes were forgetting giving drug and dosage (21). Port indicated among 485 nurses reported drug mistakes 36/5% were related to time of drug, 19% medication method, 155 amount of drug and 10% not prescribed drug (22). Regarded to these studies wrong drug, wrong dosage, wrong time of giving drug, wrong amount of drug and forgetting giving drug are considered as causes of drug mistakes.

In the present study nurses made most of mistakes. Darabi study results confirms this finding, 40/1% recorded medical mistakes were related to nurses (23). Maurer pointed that during a year ¼ nurses make mistakes and harm patients. 60% nurses make at least one harmless mistake (14). According to another study most of drug mistakes were made by nurse's assistants (24). It confirms present study results. Regarding to the close relationship between nurses and patients, in a medical team they are more probable to make medical mistake. Nurses' errors are preventable by lessening their work load, providing suitable shifts and trying to notice causes of mistakes. The most recorded mistakes were related to screen department. It was in opposite of Shmsaei (25), Hadavand (26), Mahammadnejad (19) and Ebrahimi Rigi Tanha (20). As patients refer to screen department at arrival, this crowde results in increasing medical mistakes in screen department.

In addition exhaustion, high work load, insufficient pharmaceutical knowledge, implementing drug orders carelessly, loss of manpower in departments doubles the incidence of drug mistakes. Preventive interventions include medical edu-

cation, writing pharmaceutical similarities in nurse stations and encouraging nurses to report mistakes.

Present study proves that most of mistakes take place in morning shifts. This finding confirms Kouser study results. Mohsenzade indicated that most of mistakes took place in night shifts and holy days (24). According to another study most of mistakes took place in afternoon due to exhaustion, high work load and crowded department (23). Unsuitable shifts results in medical mistakes. Considering nurses important role on patients healing, providing appropriate schedule prevents medical mistakes.

In the studied hospital nurses believed that the main cause of drug mistake was incomplete drug orders. Mirco proved that illegible drug order is the main cause of drug mistakes (27). Other study indicated that pretermission while drug delivery resulted in drug mistakes (27). These results confirm findings of Moghaddasi (1), Vahidi and Beigi (29). Valizade indicated that in 74/1% of studied files necessary drug advices were not mentioned (30). Enguidanous believed illegible and incomplete drug orders and medical abbreviations were causes of drug mistakes (31). Studies indicated that half of drug mistakes were due to insufficient pharmaceutical knowledge (32). These results confirm findings of present study but opposes Michael findings (33). Regarded to physician important role in patients healing illegible prescription and drug orders impact on patients' health. Writing prescriptions carefully and patiently prevent drug errors. Nurses believed that other causes of drug mistakes included pharmaceutical similarity, reading or implementing orders carelessly and loss of man power for handling patients. Drug similarities in name, size, color and appearance results in nurses drug mistakes. According to a study in America clinical mal function, carelessness, loss of pharmaceutical knowledge and experience resulted in drug mistakes (21). Soozani indicated that low numbers of nurses for handling patients resulted in drug mistakes. Considering close relationship between nurses and patients, they play important role on drug mistakes incidence. Unfortunately high work load and crowded departments provide condition for making drug mistakes (17). Other study considered loss of man power as important cause of drug errors (4). Drug mistakes can be prevented by increasing numbers of nurses in crowded departments and lessening their work load.

5 Study Limitations

Short period of study was due to loss of statistics. It is advisable to conduct future studies in longer period.

6 Conclusion

Patients' safety is of paramount importance in hospital. Medical mistakes are not only harmful to patients health but also impact on personnel medical knowledge, improve Physician prescription techniques, lessen nurses work load, increase numbers of nurses in crowded departments, improve personnel pharmaceutical knowledge and encouraging Physicians to write legible drug orders.

Acknowledgment

We would like to thanks the hospital managers administer and chief executive officer, clinical and administer departments, personnel who assisted us to carry out this study.

References

[1] Moghadasi H.The role of computer system registration on reduction medication errors, Journal of Health Management Research 2005; 10(27):57-69.
[2] Nasiri A. Hidden threats in the incidence of medical errors in public hospitals of Tehran, Hormozgan Medical Journal 2011; 5(2): 152-162.
[3] Kiekavoosi Arani L. Overt Threats Affecting Medical Errors in Public Hospitals in Tehran Province. Teb VA Tazkeih 2011; 20(1, 2): 65-76.
[4] Jolayi S. review of Occurrence and reporting of nursing medication errors in hospitals, and its relation to working conditions in Iran University of Medical Sciences, Journal of Medical Ethics and History of Medicine 2005; 3(1): 65-76.
[5] Grober ED. Defining medical error. Can J Surg. 2005; 48:39-44.
[6] Weisbaum K. consent required for publication of medical error? , Health care quarterly
[7] 2005, 8(4):66-69.
[8] Haghi Z. Factors in sentencing of surgical teams in claims medical malpractice and Quality claims handling in Mashhad Medical system. Legal Medicine 2005; 11(39): 137-141.
[9] Sari Ba. The extent, nature and consequences of adverse events: results of a retrospective case note review. In a large NHS hospital.2007.16:434-439.
[10] Safdari R. The importance of an electronic registration system for Complaints referred to the medical malpractice in Iran Organization of Legal Medicine 2005; 11(2):99-106.
[11] Rahimi S, Seyyed-rasouli A. Nurse's drug precautions awareness. Iran J Nurs 2004; 16(36): 53-6.
[12] Guchelaar HJ, Colen HB, Kalmeijer MD, Hudson PT, Teepe-Twiss IM. Medication errors: hospital pharmacist perspective. Drugs 2005; 65(13): 1735-46.
[13] Kouhestani, H.Baghcheghi N.Investigation medication errors of nursing students in cardiac care unit sci J forensic medicine.2008, (4); 249-255.
[14] Virpi J, Kaija S, David WB. Preventable adverse drug events and their causes and contributing factors: the analysis of register data. International Journal for Quality in Health Care 2011; pp. 1–11.
[15] Soozani A, Bagheri H, Poorheydari M. Survey nurses view about factors affects medication errors in different care units of Imam Hossein hospital in Shahroud. Journal of Shahroud University of Medical Science 2007; 2(3): 8-13.
[16] Mihaildis A. Assistive computing devices: a pilot studyvto explore nurse's preferences and needs. Comput Inform Nurs 2006; 24(6): 36-328.
[17] Penjveini, S.the study of prevalence and type of medixation errors among staff nurses of educational hospitals in sanandaj.The J of Nurs Res2006.1 (1):59-64.
[18] Seidi M. nurses' views about the causes of medication errors and barriers to reporting in the pediatric ward of hospitals of Mashhad University of Medical Sciences , Fasa University of Medical Sciences 2012; 2(3): 142-147.
[19] How CM, Dickens G, Stubbs J, A review of medication administration errors

reported in a large psychiatric hospital in the United Kingdom. Psychiatr Serv 2005; 56(12): 1610-3.

[20] MohammadNejad S, Hojjati H, Ehsani R. The amount and type of medication errors in nursing students in four teaching hospitals of Tehran. Journal of Medical Ethics and History 2009; 3(0): 60-69.

[21] Abrahimi Rigi Tanha Z, Baghaee R, Faiezi A. Frequency and type of medication errors made by nurses students Urmia University of Medical Sciences. College of Nursing and Midwifery 2012; 10(2): 139-144.

[22] Wolf ZR, Hicks R, Serembus JF. Characteristics of medication error made by students during Administration phase: a desciptive study. J Prof Nurs 2006; 22(1): 39-51.

[23] Port S, Fonta JE, Alberti C, etal. Drug administration errors and their determinants inpediatric in patients. Int J Qual Health care 2005; 17(5): 9-381.

[24] Darabi, F. The frequency of Nursing and Midwifery errors in the cases referred to the Medical Council in Kermanshah, journal of Kermanshah: 2009, 13 (3) 261-266.

[25] Mohsen zade Aizam, Rezapoor, Sadegh, Birjandi, Mahdi, The Reviews of prevalence of medical errors in inpatient children in sahid madani hospital of Khoram Abad. Journal of Lorestan University of Medical Sciences 2009; 11(4): 31-38.

[26] Shamsaii, monireh, faraji, abidollah, ramezani, abbas Ali, seyed pooriya, hedayati, The viewpoints of Zabol's General Practitioners about medical errors in, Journal of hospital 2011; 10(4): 31-36.

[27] Hadavand, N. Javadi, M.R. Gholami, KH. Medication errors, Razi Journal 2006, 16(34):11-42.

[28] Mirco A, Compos L, Falcao F, Nunes, Aleixo A. Medication errors in an internal medicine department. Evaluation of a computerized prescription system. Pharm World Sci 2005; 27(4): 2-351.

[29] Lám J, Rózsa E, Kis Szölgyémi M, Belicza É [Survey of drug dispensing errors in hospital wards. Orvosi Hetilap. 2011. 152 (35), pp. 1391-1398

[30] Vahidi AR, Beigi AM. Error of pharmacies in medical services. Proceedings of the Second National Conference on prevention of medical errors. 2007 May: Lorestan, Iran.

[31] Valizadeh F, Ghasemi SF, Mohsenzadeh A. Errors in medication orders and nursing staff report in medical notes of children. Iran J Pediatr 2008; 18(1 Suppl): 33-40.

[32] Enguidanos SM, Brumley RD. Risk of medication errors at hospital discharge and barriers to problem resolution. Home Health Care Serv Q 2005; 24(1-2): 123-35.

[33] Rezaeehachesoo P, Habibi SH, Fozonkhah SH. Information technology, an effective tool in reducing and preventing medical errors: suggestions for improvement. Journal of Health Information Management. 2007; 4:89-98.

[34] Micheal L. Characteristics of pediatric chemotherapy medication errors in a national error reporting database. Journal of Cancer 2007; 107(1): 186-195.