Medication administration errors in Eastern Saudi Arabia

Mir Sadat-Ali, FRCS, FICS, Badar A. Al-Shafei, BPhar, MS, Rasha A. Al-Turki, BSN, Syed E. Ahmed, MBBS, Salman A. Al-Abbas, B.Pharma, Abdallah S. Al-Omran, MBBS, SSC.

ABSTRACT

الأهداف: تقييم مدى انتشار الأخطاء في طريقة صرف الأدوية للمرضى الذين دخلوا إلى مستشفى جامعة الملك فهد بالخبر، وتحديد صفات مثل هذه الأخطاء الطبية.

الطريقة: أجريت هذه الدراسة الاسترجاعية في مستشفى جامعة الملك فهد، الخبر، المملكة العربية السعودية حيث قمنا بجمع كافة تقارير الأخطاء الطبية والتي تم عملها خلال الفترة من يناير 2008م إلى ديسمبر 2009م. لقد قام كلاً من الأطباء والممرضات بتسجيل الأخطاء التي حصلت في طريقة صرف الأدوية للمرضى وذلك بملأ نماذج تقارير الأخطاء الطبية المُعتمدة من قبل المستشفى. لقد قمنا بدراسة هذه التقارير من حيث عمر وجنس وجنسية المرضى، ومن حيث القسم الطبي والوقت الذي حدث فيه مثل هذا الخطأ الطبي، ومن ثم تم تحليل البيانات وتحديد الفروق الإحصائية باستخدام اختبار تي (Student's t-test)، واُعتبرت القيم الاحتمالية (*p*-values) التي كانت أقل من 0.05 ذات دلالات إحصائية كبيرة أي أن قيم الفترات الفاصلة أو مدى الأمان الإحصائي (confidence interval) كانت 95%.

النتائج: لقد قمنا برصد 38 خطأً في طريقة صرف الأدوية للمرضى، وقد كانت أعمار المرضى تتراوح مابين 5 أيام إلى 70 عاماً. أشارت الدراسة إلى أن عدد المرضى السعوديين الذين تعرضوا إلى هذه الأخطاء كان 31 مريضاً، فيما كان عدد المرضى من الجنسيات الأخرى 7 مرضى. وكانت أكثر هذه الأخطاء حدوثاً هي فقد الدواء أي عدم وصول الدواء للمريض كما هو موصى به وقد شوهد ذلك في 15 مريضاً (39.5%)، وحدثت أغلب الأخطاء في طريقة صرف الأدوية وبنسبة فاقت 50% (19 خطأً) في قسمين بالمستشفى وهما قسم الأطفال، و قسم النساء و الولادة. كما لوحظ أن (50%) (19 خطأً) من هذه الأخطاء كانت في الفترة المسائية ما بين 11-3.

خاتمة: أظهرت الدراسة إلى أن نسبة الأخطاء في طريقة صرف الأدوية للمرضى تعد منخفضة لدينا بالمستشفى وذلك بالمقارنة مع نتائج الدراسات العلمية الأخرى. ويرجع السبب في ذلك إلى التزام الأقسام الطبية بتسجيل الأخطاء الطبية لدراستها ووضع الحلول والاحتياطات لعدم تكرار هذه الأخطاء مرة أخرى.

Objectives: To assess the prevalence and characteristics of medication errors (ME) in patients admitted to King Fahd University Hospital, Alkhobar, Kingdom of Saudi Arabia.

Methods: Medication errors are documented by the nurses and physicians standard reporting forms (Hospital Based Incident Report). The study was carried out in King Fahd University Hospital, Alkhobar, Kingdom of Saudi Arabia and all the incident reports were collected during the period from January 2008 to December 2009. The incident reports were analyzed for age, gender, nationality, nursing unit, and time where ME was reported. The data were analyzed and the statistical significance differences between groups were determined by Student's t-test, and *p*-values of <0.05 using confidence interval of 95% were considered significant.

Results: There were 38 ME reported for the study period. The youngest patient was 5 days and the oldest 70 years. There were 31 Saudis, and 7 non-Saudi patients involved. The most common error was missed medication, which was seen in 15 (39.5%) patients. Over 15 (39.5%) of errors occurred in 2 units (pediatric medicine, and obstetrics and gynecology). Nineteen (50%) of the errors occurred during the 3-11 pm shift.

Conclusion: Our study shows that the prevalence of ME in our institution is low, in comparison with the world literature. This could be due to under reporting of the errors, and we believe that ME reporting should be made less punitive so that ME can be studied and preventive measures implemented.

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From the Department of Orthopedic Surgery (Sadat-Ali, Al-Omran), Department of Pharmacy (Al-Shafei, Al-Abbas), and the Department of Nursing (Al-Turki), Department of Internal Medicine (Ahmed), King Fahd University Hospital, Alkhobar, Kingdom of Saudi Arabia.

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Address correspondence and reprint request to: Prof. Mir Sadat-Ali, Department of Orthopedic Surgery, King Fahd University Hospital, PO Box 40071, Alkhobar 31952, Kingdom of Saudi Arabia. Tel. +966 505848281. Fax.+966 (3) 8820887. E-mail: drsadat@hotmail.com

Health Care delivery is not free from errors, and it is the seventh most common cause of mortality in hospitals.[1] Medication Errors (ME) are broadly defined as errors in prescribing, dispensing, or administration of a drug, irrespective of whether such errors lead to adverse consequences or not.[2] Medication error means the administration of any medication incorrectly, for example, dosage, selection of drug, time, or method of administration, omission of prescribed medication, or the administration of a medication without a valid order.[3] As drug administration is an integral part of the nurses practice, the chances of ME at the hands of the nursing staff are high.[4] Medications errors usually are not fatal, but a recent study from the United States of America has put fatalities directly due to ME at 7,000, and the drug related morbidity runs over $77 billion yearly.[5] It has been reported that the incidence of ME among inpatients is between 9-13%.[6-8] Recently Otero et al[9] reported a prevalence of ME of 11.4%. It was reported that 52 errors occur per 100 admissions,[10] but Rothschild et al[11] found that 1.7 errors occurred per day in the intensive care unit. Many causes have been attributed to ME. Tang et al[12] found that (76.4%) believed more than one factor was the cause in ME, but personal neglect was responsible in 86.1% of instances. Many nurses believe that ME is not due to their personal neglect, but due to miscommunication between the physicians and the nursing staff.[13] Even though the issue of patient safety and ME is an important one, little attention is given in the developing world to this issue, hence with the objective of finding the prevalence of ME and any adverse events it had caused; this retrospective study was carried out.

Methods. King Fahd University Hospital, Alkhobar is a 470-bed tertiary care hospital of the College of Medicine, University of Dammam, Dammam, Kingdom of Saudi Arabia. Approval was obtained from the Research and Ethical Committee of the Hospital and the University. It is mandatory to report MEs, and they are reported by the nurses/physicians by way of "Hospital Based Incident Report." The incident reports were collected during the period January 2008 to December 2009. The definition of ME was carried out on the basis of the American Society of Health-System Pharmacists.[14] The incident reports were analyzed for age, gender, nationality, nursing unit, and time where ME was reported, incorrect patient, incorrect route, incorrect medication, missed medication, and expired medication. The medical charts were evaluated for any adverse event due to the error.

The data were analyzed using the Statistical Package for the Social Sciences, version 14.0, (SPSS Inc, Chicago, IL, USA). Data were expressed as mean ± standard deviation. Statistical significance differences between groups were determined by Student's t-test, and *p*-values of 0.05 using confidence interval of 95% were considered significant.

Results. During the study period, there were 38 ME reported for 23957 admissions, an incidence of 0.15%. The youngest patient was 5 days and the oldest 70 years. There were 31 Saudis and 7 non-Saudi patients involved. The demographic data of the patients are given in **Table 1**. The most common error was missed medication, followed by expired medications and wrong time of medications (**Table 2**). Over 15 (39.5%) MEs occurred in 2 units (pediatric medicine, and obstetrics and gynecology units) (**Table 3**). Nineteen (50%) of the errors occurred during the 3-11 pm shift, 12 errors during the 7-3 pm shift and 6 errors during the 11-7 am shift. The average number of days 22.6±8.34 in patients were ME occurred. There were 3 adverse events where patients had to stay in the hospital more than

Table 1 - Data of study population.

Parameters	Study group
Number of errors	38
Adults	24 (63.1%)
Children	14 (36.9%)
Number of days in hospital	22.6±8.34
Serious adverse event	3

Table 2 - Different medication errors.

Type of error	n (%)
Incorrect dose	4 (10.5)
Incorrect medication	4 (10.5)
Incorrect route	4 (10.5)
Expired medication	6 (15.8)
Missed medication	15 (39.5)
Incorrect time	5 (13.2)

Table 3 - Units reporting medication errors.

Unit reporting error	Numbers
Pediatric medicine	9
Obstetrics and gynecology	6
Intensive care	5
Female surgical	4
Male orthopedic	3
Female medical	3
Female surgical	3
Neonatal intensive care	2
Male medical	2
Operating room	1

they should have. None of the patients in this study experienced permanent harm, or died because of ME.

Discussion. Our study showed that the incidence of ME in our inpatients was 1.58 for every 1,000 admissions. The results of this study highlight the existence and importance of ME in our hospital environment, even though most errors were not serious and no patient suffered observable harm as the result of ME. Dibbi et al[15] analyzed medical charts for 3 years admissions totalling 2,627 patients, and found 3,963 ME. Our patients safety and nursing protocol states if an error is made then, it is reported in the standard reporting form (Hospital Incident Report Form), with meticulous detail. The prevalence of ME reported in our institution appears much lower than any other report in the literature; this could be due to under reporting by the staff. Haw, et al[16] reported, after an observational study, that ME occur in fact 2 and half times more than they were reported. Hence, we are compelled to speculate that probably the incidence of ME in our hospital is much higher than reported.

The incidence of ME is reported to be higher in children in comparison with the adults,[17] as one could comprehend adult patients telling the nursing staff they did not receive the medication, or the route of medication is incorrect. One of the striking findings of this small sample is that ME occurred more in adults than pediatric patients (63.1% to 37.9%). Wirtz et al[18] and other studies found that 34% of the ME were due to nurses, but in our analysis 37 ME were due to nurses and one was due to a physician.

Medication errors are a serious issue, and demand close attention from hospitals administrators, nursing staff, and clinicians. We believe that a substantial number of ME either were not detected, or were not reported due to fear of being regarded incompetent and afraid of being censored. The ME are preventable, and to do that one should know the factors and circumstances under which they occur in an institution. The preventive measures can be implemented if all the ME are reported. To make such an atmosphere a non-punitive approach should be adapted to improve the rate of reporting of ME. This study has the limitations any retrospective study will have. Other limitations are that the study was conducted at one institution in one region and that the correct picture of ME in Saudi Arabia will not be known. Lastly instead of looking for ME in 23,957 files for the study period, we opted to study the hospital incident reports.

In conclusion, we believe that the prevalence of ME in our hospital was low, which could be due to under reporting, as a higher prevalence has been reported in the best of institution. Most of the errors were preventable. It is possible that we have only seen the tip of the iceberg, and unless we encourage our staff to report, we may not know the true extent of the problem.

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