Original Research

Description of medication errors detected at a drug information centre in Southern Brazil

Luciana DOS SANTOS, Natália WINKLER, Marlise A. DOS SANTOS, Jacqueline K. MARTINBIANCHO.

Received (first version): 17-Oct-2014 Accepted: 28-Feb-2015

ABSTRACT[*]

Objective: To identify and describe actual or potential medication errors related to drug information inquiries made by staff members of a teaching hospital to a Drug Information Centre from January 2012 to December 2013.

Methods: Data were collected from the records of inquiries made by health care professionals to the Drug Information Centre throughout this period.

Results: During the study period, the Drug Information Centre received 3,500 inquiries. Of these, 114 inquiries had medication errors. Most errors were related to prescribing, preparation, and administration and were classified according to severity as category B (57%) (potential errors) and categories C (26.3%) and D (15.8%) (actual errors that did not result in harm to the patient). Error causes included overdose (13.2%), wrong route of administration (11.4%), inadequate drug storage (11.4%), and wrong dosage form (8.8%). The drugs most frequently involved in errors were vitamin K (4.4%), vancomycin (3.5%), and meropenem (3.5%).

Conclusion: In this study, it was not possible to measure the reduction in error rate involving medication use because of the lack of previous data on this process in the institution. However, our findings indicate that the Drug Information Centre may be used as a strategy to seek improvements in processes involving medication use.

Keywords: Medication Errors; Patient Safety; Drug Information Services; Pharmacy Service, Hospital; Brazil

[*] **Luciana DOS SANTOS**. Pharmacy. Drug Information Centre, Hospital de Clínicas de Porto Alegre. Porto Alegre, RS (Brazil). lusantos@hcpa.ufrgs.br

Natália WINKLER. School of Pharmacy. Pontifícia Universidade Católica do Rio Grande do Sul. Porto Alegre RS (Brazil). nataliawinkler_478@hotmail.com

Marlise Araújo DOS SANTOS. School of Pharmacy. Pontifícia Universidade Católica do Rio Grande do Sul. Porto Alegre RS (Brazil). marlise.santos@pucrs.br

Jacqueline K. MARTINBIANCHO. Pharmacy. Drug Information Centre, Hospital de Clínicas de Porto Alegre. Porto Alegre, RS (Brazil). Jmartinbiancho@hcpa.ufrgs.br

INTRODUCTION

Drug Information Centres (DICs) provide technical and scientific information about medications in an objective and independent manner and fulfil the need for specific information.[1,2] In Brazil, there are DICs in public and private hospitals, universities, pharmacies, and state health departments. According to the Brazilian Drug Information Centre (CEBRIM), Brazil currently has 22 DICs.[3]

It is estimated that 30% of harmful events during hospital stay are associated with medication errors.[4,5] A medication error can be defined as any preventable event that may cause patient harm or lead to inappropriate medication use. These events may be related to professional practice, procedures, or health care systems.[6] However, when a medication error is detected during the process before reaching the patient, this may be classified as a potential error or near miss.[7]

The main objective of the DICs is to promote the rational use of medications. These agencies play an important role in preventing potential medication errors, thus contributing to improve patient safety.[8] The Brazilian Ministry of Health recently passed the Ordinance 2674/2013 that implemented the Brazilian Network of Services and Drug Information Centres (REBRACIM) in order to promote and support the actions of pharmaceutical care at different levels within the Brazilian Unified Health System.[9]

Detection of medication errors helps develop effective practices that ensure adequate and rational use of drugs, thereby increasing patient safety. Therefore, the objective of the present study was to identify and describe actual or potential medication errors related to the drug information inquiries made by staff members of a teaching hospital (Hospital de Clínicas de Porto Alegre) to a DIC from January 2012 to December 2013.

METHODS

The DIC investigated in this study is situated within the clinical pharmacy of Hospital de Clínicas de Porto Alegre, a 845-bed tertiary care teaching hospital located in the city of Porto Alegre, Southern Brazil. The pharmacy has 17 clinical pharmacists, two of whom work for the DIC. Service is available from 8:00 AM to 6:00 PM, Monday through Friday. The clinical pharmacists work directly with patients and health care teams in inpatient units by evaluating prescription orders, monitoring drug logistics, providing the nursing staff with guidance

on drug preparation and administration, performing medication reconciliation, and giving guidance to patients at discharge. DIC pharmacists, in addition to knowledge of clinical pharmacy, must have a master degree and formal qualification in another DIC model. Regarding their activities, DIC staff members provide support to health care teams on their clinical decisions, including other clinical pharmacists working in the units, by researching and collecting the information needed to answer the inquiries, help develop information hand-outs and newsletters on safe medication use practices in the institution, participate in the institution's medication committee (or in the pharmacy and therapeutics committee), and collaborate with activities for the multidisciplinary residency program.

We conducted a retrospective descriptive study based on drug information inquiries made by staff members of Hospital de Clínicas de Porto Alegre to the DIC from January 2012 to December 2013. The main activity of the DIC is answering inquiries about drugs (passive information). The DIC counts on updated reference books, newsletters, and access to databases to fulfil the users' needs and answer their inquiries. The inquiries are made by members of the hospital staff by telephone, by e-mail, or in person.[10]

During the study period, we collected information from the question forms received by the DIC, including: month, name of the inquiring departments (clinical units, surgical units, intensive care unit, paediatric units, outpatient clinics, emergency department, clinical pharmacy, dispensing and logistics pharmacy, etc.), inquiring team (nursing team, pharmacy team, medical team, etc.), answering time (within 10 minutes, within 30 minutes, within 5 hours, within 24 hours, and after 24 hours) - the time required for resolution of the inquiries included receiving the inquiry, researching, and intervening in the error or near miss if necessary, drug mentioned, classification of the inquiry topic (administration, preparation, stability, storage/conservation, drug interactions, pharmaceutical interactions, therapeutic indications, dosage, composition, pharmacokinetics, pharmaceutical techniques, etc.), type of medication error, classification of error severity, and intervention (on prescription, on dispensing, with clinical pharmacist, nursing staff, and medical team).

We classified the types and causes of medication errors according to the guidelines of the American Society of Health-System Pharmacists (1993) regarding drug prescribing, dispensing, preparation, administration, conservation, or storage, etc.[11] The severity of medication errors was determined based on the National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP) Index for Categorising Medication Errors Algorithm. Each medication error was classified into one of nine categories (A to I) according to the potential of the error to cause harm to the patient, as follows: circumstances or events that have the capacity to cause error (category A); an error occurred but the error did not reach the patient (category B); an error occurred that reached the patient but did not cause patient harm (category C) or required monitoring to confirm that it resulted in no harm to the patient and/or required intervention to preclude harm (category D); an error occurred that may have contributed to or resulted in temporary harm to the patient and required intervention (category E) or required initial or prolonged hospitalisation (category F); an error occurred that may have contributed to or resulted in permanent patient harm (category G); an error occurred that required intervention necessary to sustain life (category H); and an error occurred that may have contributed to or resulted in the patient's death (category I).[12] Medication errors classified as category B were considered to be potential errors or near misses.

We then identified all drugs involved in actual errors and potential errors and checked whether the drug was classified as potentially dangerous according to the list of high-alert medications of the Institute for Safe Medication Practices (2012), which defines high-alert medications as drugs that bear a heightened risk of causing significant patient harm when they are used in error.[13]

For the purpose of this study, when the pharmacist of the DIC received the inquiry, he/she was able to assess, through questions asked directly to the inquirer and based on institutional procedures, whether the inquiry was related to an actual or potential medication error, detect the cause of the error, and establish if it reached and/or caused any harm to the patient. The pharmacist was also able to intervene in the error or prevent it. The outcome of the intervention was checked by calling the health care professional involved in the drug inquiry or, in their absence, the clinical pharmacist in charge of the unit involved.

Data were stored, processed, and analysed using SPSS, version 17.0. Even though our variables were qualitative, we performed a quantitative analysis because the results were expressed numerically. The study was approved by the Research Ethics Committee at the Hospital de Clínicas de Porto Alegre (no. 11-0608).

RESULTS

From January 2012 to December 2013, the DIC received 3,500 inquiries posed by telephone, by e-mail, or in person. The time to answer the inquiries varied depending on complexity and urgency of the inquiry. The most frequent time ranges were as follows: 67.6% of inquiries were answered within 10 minutes, 15.5% within 30 minutes, 3.5% within 24 hours, and 5.7% within 72 hours.

The nursing, pharmacy, and medical teams were those making more inquiries, with percentages of 52.2%, 38.3%, and 8.2%, respectively. The hospital units posing more inquiries to the DIC were intensive care units (21.8%), clinical units (15.8%), surgical units (10.3%), paediatric and neonatal units (8.2%), outpatient clinics (5.4%), and emergency department (1.8%). Regarding the pharmacy department, the units of clinical pharmacy and logistics accounted for 8.7% and 7.9% of the inquiries made to the DIC, respectively.

Table 1. Inquiry topics and inquiries related to medication errors detected by the Drug Information Centre.

Inquiry topics	n (%) (n=3,500)	Inquiries related to errors (n=114)	Category of error severity		
			Category B (n=65)	Category C (n=30)	Category D (n=18)
Administration	1,065 (30.4%)	40 (35.1%)	25 (38.5%)	10 (33.3%)	5 (27.8%)
Product storage or conservation	102 (2.9%)	12 (10.5%)	7 (10.8%)	5 (16.7%)	0
Stability	454 (13%)	4 (3.5%)	4 (6.1%)	0	0
Pharmacokinetics	34 (1%)	3 (2.6%)	1 (1.5%)	1 (3.3%)	1 (5.5%)
Pharmaceutical technique	72 (2.1%)	2 (1.8%)	0	2 (6.7%)	0
Product identification or composition	300 (8.6%)	6 (5.3%)	1 (1.5%)	3 (10%)	2 (11.1%)
Therapeutic indications	75 (2.1%)	6 (5.3%)	5 (7.7%)	1 (3.3%)	0
Pharmaceutical interactions	727 (20.8%)	8 (7%)	4 (6.1%)	0	3 (16.7%)
Drug interactions	122 (3.5%)	2 (1.8%)	0	2 (6.7%)	0
Dosage	176 (5%)	16 (14%)	12 (18.5%)	0	4 (22.2%)
Drug preparation	143 (4.1%)	9 (7.9%)	4 (6.1%)	5 (16.7%)	0
*Other	230 (6.6%)	6 (5.3%)	2 (3%)	1 (3.3%)	3 (16.7%)

* Legislation, waste disposal, occupational hazard, adverse drug reactions, toxicity, bibliography, drug record, cost of product

Considering the inquiries received during the entire period of the study, 114 (3.3%) inquiries were related to medication errors. In 2012, 1,555 inquiries were received; 55 (3.5%) of them were related to medication errors. In 2013, even though the number of inquiries increased to 1,945, the number of medication errors did not change much (n=59; 3%). The drugs most frequently involved in medication errors were vitamin K (4.4%), vancomycin (3.5%), meropenem (3.5%), heparin sodium (2.6%), amoxicillin (2.6%), ciprofloxacin (1.8%), desmopressin (1.8%), diazepam (1.8%), dipyrone (1.8%), divalproex sodium (1.8%), human immunoglobulin (1.8%), isosorbide mononitrate (1.8%), methotrexate (1.8%), morphine (1.8%), omeprazole (1.8%), calcium polystyrene sulfonate (1.8%), and polymyxin B (1.8%). Of 114 drugs involved in medication errors, 24 (21%) were high-alert medications, including sodium heparin (n=3; 12.5%), oral methotrexate (n=2; 8.3%), morphine (n=2; 8.3%), and intrathecal polymyxin B (n=2; 8.3%).

Table 1 shows inquiry topics and inquiries related to medication errors (n=114), including the severity of errors detected. As for error type, 57 (50%) errors were related to prescription, 18 (15.8%) to preparation, 16 (14%) to administration, 13 (11.4%) to storage or conservation, 7 (6.1%) to dispensing, and 3 (2.6%) to other types, such as product registration problems and waste disposal.

The hospital departments with the largest number of inquiries related to medication errors were as follows: clinical departments (n=33; 28.9%), dispensing and logistics pharmacy (n=17; 14.9%), intensive care units (n=16; 14%), surgical units (n= 14; 12.3%), and outpatient clinics (n= 8; 7%). Most of these departments posed their inquiries by telephone (85%). The severity of medication errors detected in these departments are shown in Table 2.

The main problems leading to medication errors and their relation to error severity are shown in Table 3. Of 114 medication errors detected, 65 (57%) were potential errors that did not reach the patient (category B), and the remaining were actual errors that reached the patient: 30 (26.3%) errors were classified as category C and 18 (15.8%), as category D and 1 error how not applicable. We did not detect any category A, E, F, G, H, or I errors. In our DIC, we were unable to detect error situations involving category A errors given the complexity of the study and because such circumstances are covered by other institutional programs on patient safety and quality assurance. Thus, the DIC acts more specifically to resolve near misses and actual errors.

When a medication error was detected based on the inquiry, the pharmacist of the DIC intervened in 100% of cases to prevent new errors. Interventions consisted of direct action involving the nursing team

Table 2. Severity of medication errors and major problems detected at hospital departments.

Hospital department	n (%) (n=114)	Category of error severity			Major problems
		Category B (n=65)	Category C (n=30)	Category D (n=18)	
Clinical units	33 (28.9%)	19 (29.2%)	8 (26.6%)	6 (33.3%)	Route of administration (18.2%) Overdose (12.1%)
Dispensing and logistics pharmacy	17 (14.9%)	10 (1.5%)	4 (13.3%)	3 (16.6%)	Overdose (29.4%) Inadequate storage (17.6%)
Intensive care units	16 (14%)	5 (7.7%)	8 (26.6%)	3 (16.6%)	Incompatibility (25%) Wrong volume of diluent (25%)
Surgical units	14 (12.3%)	11 (16.9%)	3 (10%)	0	Route of administration (14.3%) Therapeutic indication (14.3%)
Outpatient clinics	8 (7%)	6 (9.2%)	1 (3.3%)	1 (5.5%)	Overdose (12.5%) Inappropriate infusion time (12.5%)
Clinical pharmacy	8 (7%)	6 (9.2%)	2 (6.6%)	0	Wrong dosage form (25%) Inadequate storage (25%)
Paediatric units	7 (6.1%)	2 (3.0%)	2 (6.6%)	2 (11.1%)	Route of administration (28.6%) Inadequate storage (28.6%)
*Other	11 (9.7%)	6 (9.2%)	2 (6.6%)	3 (16.6%)	

* Centre for intravenous mixtures, satellite pharmacies, primary health care units, hospitals.

Table 3. Main problems leading to medication errors and their relation to error severity.

Main problems leading to error	n (%) (n=114)	Category of error severity		
		Category B (n=65)	Category C (n=30)	Category D (n=18)
Overdose	15 (13.2%)	13 (20%)	0	2 (11.1%)
Wrong route of administration	13 (11.4%)	7 (10.7%)	4 (13.3%)	2 (11.1%)
Inadequate conservation and storage	13 (11.4%)	8 (12.3%)	5 (16.6%)	0
Wrong dosage form for route of administration	10 (8.8%)	7 (10.7%)	2 (6.6%)	1 (5.5%)
Drug incompatibility	9 (7.9%)	5 (7.7%)	1 (3.3%)	3 (16.6%)
Wrong or inadequate therapeutic indication	6 (5.3%)	5 (7.7%)	1 (3.3%)	0
Wrong volume of diluent for infusion	6 (5.3%)	0	5 (16.6%)	1 (5.5%)
Incorrect reconstitution	3 (2.6%)	3 (4.6%)	0	0
Inadequate time or speed of infusion	3 (2.6%)	3 (4.6%)	0	0
Inadequate frequency or interval of administration	3 (2.6%)	1 (1.5%)	0	2 (11.1%)
Wrong dispensing	3 (2.6%)	1 (1.5%)	1 (3.3%)	1 (5.5%)
Omission	2 (1.8%)	1 (1.5%)	0	1 (5.5%)
Underdose	2 (1.8%)	0	1 (3.3%)	1 (5.5%)
Time or duration of inadequate treatment	1 (0.9%)	1 (1.5%)	0	0
Amount of incorrectly dispensed medication	1 (0.9%)	0	0	1 (5.5%)
Severe drug interaction	1 (0.9%)	0	1 (3.3%)	0
*Other	22 (19.3%)	10 (15.3%)	9 (30%)	3 (16.6%)
Not applicable	1 (0.9%)	0	0	0

* Calculations, diluent concentration.

over the phone (37.7%); direct action over the electronic prescription by warning the medical team (25.4%); joint intervention with the clinical pharmacist of the unit to solve the problem with the teams because of the complexity of the case (22.8%); direct contact with the medical team (10.5%), and intervention in drug dispensing at the pharmacy (2.6%). Interventions related to drug preparation, storage, infusion, and incompatibility were made directly with the nursing staff. However, interventions to solve problems associated with overdosing or underdosing, omission, wrong route of administration, wrong dosage form for route of administration or patient, and therapeutic duplication or wrong therapeutic indication were made directly with the medical team through the DIC or the clinical pharmacist in charge of the unit involved. Problems related to product logistics (such as dispensing, storage, and amount) were resolved directly with the pharmacist of the unit.

DISCUSSION

Errors often go unreported due to fear of administrative measures that may be taken against the staff member involved.[14-16] Punishment, feelings of guilt, and concerns about the severity of the error can lead the individuals involved to underreport the event. It is estimated that only 25% of the errors are reported by staff members.[17] A descriptive study conducted from 2010 to 2011 at our hospital analysed spontaneous reports of medication errors. There were 165 reports. Of these, 69% were classified as medication errors and 30.9% were potential errors.[18] In the present study, we detected 114 errors, and 41.2% of them were classified as actual medication errors and 57% were potential errors. The remaining 1.8% did not apply to the study (waste disposal, product registration). Even though there are ways to prevent errors, such as electronic prescription, electronic dispensing, validation of prescription by a clinical pharmacist, these error rates are high and related to the steps involving prescription, preparation, and administration. Furthermore, when comparing data from different studies, the DIC detected a higher rate of potential errors.[14,17,18] This finding may indicate that the DIC took active measures to prevent errors based on the intervention conducted by its pharmacist, who answered the questions posed by the inquiring professional and made sure that the patient receive the correct medication.

Electronic prescription is used at our hospital. Before medications are dispensed according to a barcode, they are validated (evaluated) by the clinical pharmacist of each specific unit regarding prescribed dose, route of administration, duration of treatment (antibiotics), and appropriate dosage form. In addition, some units have electronic dispensers to minimize incorrect dispensing. However, nurses are responsible for the steps involving preparation, except for some injectable drugs (chemotherapeutic agents, parenteral nutrition, and anaesthetics) and paediatric oral forms, and administration based on good practice routines of preparation and administration of medications. Thus, there is no electronic control at the time of administration. There is double check only for special medications like chemotherapeutic agents and parenteral nutrition. One-third of all errors that cause harm to patients is related to the administration. Nursing teams are responsible for the safe, efficient, and responsible administration of drugs.[17] Nurses are involved in up to 60% of medication errors, including the administration of medication at inappropriate times, omission, wrong dose, and wrong route of administration.[14-19] The nursing team was the most frequent inquirer of the DIC (52.2%), and this warrants the importance of a centre that can solve doubts before drug administration, thus ensuring a safer processes. In our institution, the DIC is in close contact with quality assurance and process safety management groups in order to organize and distribute information hand-outs and materials to health care teams working directly with patients. Currently, in addition to the active involvement of clinical pharmacists with health care teams in the units, the institution offers staff members online information on the preparation, administration, storage

temperature and stability of all products available to patients, and this website is updated regularly by the DIC. Also, quarterly, a newsletter is released by the DIC with relevant information on new products being used at the institution, new procedures, and pharmacovigilance alerts.

Our study confirms the data found by Dalmolin *et al*. (2013) in terms of steps involving errors. These authors found that most errors occurred during prescription (50% vs. 48.25%). In our study, the most frequent problems were related to overdose and incorrect route of administration; whereas Dalmolin *et al*. found that therapeutic duplications or duplication of drugs were the main spontaneously reported problems.[18]

Actual errors are detected after their occurrence, and potential errors are detected and corrected before drug administration to the patient.[20] Kopp *et al*. (2006) found that potential errors accounted for 83% in adult intensive care units, occurring mainly during drug dispensing (34%) and administration (34%). Actual errors accounted for 17%; of these, 77% occurred during prescription and 23% during administration.[21] In the present study, we found that 14% of the errors were related to adult and paediatric intensive care units; of these, 22.9% reached the patient - actual errors, and 7.7% were classified as potential errors, both related to errors during preparation and administration of medications. Intensive care units were responsible for 21.8% of the inquiries. This can be explained by the fact that these areas treat high complexity patients receiving large numbers of drugs, especially injectable drugs, thus increasing the risk of error.[22] Salazar *et al*. (2011) reported that they found 66 medication errors in 52 out of the 124 adult patients in an intensive care unit, and 33% of patients involved in errors were affected by errors more than once. The most frequent errors (51%) were related to administration (speed and time); whereas 18% were related to prescription and 15% to preparation.[23] Stavroudis *et al*. (2010) reviewed the types of medication errors in paediatric intensive care units. They found that administration errors are also among the most frequent in 48% of cases; in addition, wrong dose (26.9%), omission (18.6%), and wrong time or speed of administration (17.6%) are the main problems detected.[24] Because of highly complex medication regimens and medical treatments, intensive care units are often more prone to human error, and strategies should be adopted to minimize such errors.

Regarding high-alert medications, they accounted for 21% of errors and were related to errors in preparation or dose that did not reach the patient. Such medications are considered high-alert drugs because of their high risk of causing serious harm to the patient if administered incorrectly, with the possibility of leading to death. At our hospital, these drugs have specific dispensing and storage routines in the units. They are labelled using different colours and dispensed only after evaluation of the prescription by a clinical pharmacist. There are institutional protocols for potassium chloride, as well as other concentrated electrolytes and warfarin. Silva *et al*. (2011) reviewed the prescription and dispensing process of high-alert medications in paediatric units of a teaching hospital and found that 723 (42.4%) dispensing errors were concomitantly related to prescription errors. Lack of dose information was the main problem in 84.8% of cases.[25]

The rate of medication errors detected by the DIC was not statistically significant, ranging from 3.3% in 2012 to 3% in 2013; however, 57% of the errors did not reach the patient, thus showing the importance of the centre. We could not find previous studies of medication errors and DIC. Therefore, the discussion was based on studies of medication errors conducted in hospitals.

A limitation of our study is that the rate of medication errors detected by the DIC may not represent the actual number of errors occurred in the hospital. This may be the case because this rate includes only the errors detected while the staff members of the DIC were answering inquiries, which was confirmed by the little variation in the total number of errors between 2012 and 2013. Different strategies of dissemination of the actions taken by the DIC at the hospital need to be developed to increase the number of inquiries, thus offering the opportunity for more interventions in potential errors. For this purpose, the institution's risk management group has been working on the causes of near misses and medication errors seeking to develop strategies for prevention and improvement in the safety of the medication use process. However, these errors are spontaneously reported by health care professionals, which may still lead to the underreporting of events. Another important limitation is that there are no data on the outcome of patients involved in medication error processes.

Pharmacists play a fundamental role in the use of drugs, being important elements to detect and correct potential and actual problems related to medications.[14] Electronic dispensers, single dose, barcode dispensing, and electronic control at the time of administration are some of the strategies that may be used to prevent medication errors.[22]

In Brazil, REBRACIM, supported by the Ministry of Health, is seeking to close the gap between the DICs and health professionals working in the Unified Health System as a way to support the clinical decisions, thus leading to a rational use of medications.

CONCLUSIONS

This study has shown that the DIC, as an operational unit providing evidence-based responses to drug information questions, is able to provide health care professionals with guidance on all stages of the medication use process, from prescribing to administration of the drug to the patient in a safe and effective manner. In addition, by promoting education, the DIC contributes to the prevention of errors in processes involving medication use, thus achieving the best therapeutic results for the hospitalized patient. In this study, it

was not possible to measure the reduction in error rate involving medication use because of the lack of previous data on this process in the institution. However, our findings indicate that the DIC may be used as a strategy to seek improvements in processes involving medication use.

CONFLICT OF INTEREST

The authors report no conflicts of interest.

Financial Support: FIPE – Hospital de Clínicas de Porto Alegre.

DESCRIPCIÓN DE LOS ERRORES DE MEDICACIÓN DETECTADOS EN UN CENTRO DE INFORMACIÓN SOBRE MEDICAMENTOS EN EL SUR DE BRASIL

RESUMEN

Objetivo: Identificar uy describir los errores de medicación potenciales y reales relacionados con consultas de información sobre medicamentos realizadas por personal sanitario de un hospital universitario a un centro de información sobre medicamentos entre enero 2012 y diciembre 2013.

Métodos: Se recogieron los datos de las fichas de consultas realizadas por el personal sanitario al centro de información de medicamentos durante este periodo.

Resultados: Durante el periodo de estudio el centro de información de medicamentos recibió 3.500 consultas. De esas, 114 consultas tenían errores de medicación. La mayoría de los errores estaban relacionados con prescripción, preparación y administración, y se clasificaron de acuerdo a su gravedad como categoría B (57%) (errores potenciales) y categorías C (26,3%) y D (15,8%) (errores reales que o produjeron daño en el paciente). Las causas de ero incluían sobredosis (13,2%), via de administración equivocada (11,4%), almacenamiento inadecuado del medicamento (11,4%), y forma farmacéutica equivocada (8,8%). Los medicamentos más involucrados en los errores eran la vitamina K (4,4%), vancomicina (3,5%), y meropenem (3,5%).

Conclusión: En este estudio no fue posible medir la reducción de la tasa de errores relativos al uso de medicamentos por la falta de datos previos sobre este proceso en la institución. Sin embargo, nuestros hallazgos indican que el centro de información de medicamentos puede ser utilizado como una estrategia para buscar mejoras en el proceso de uso de medicamentos.

Palabras clave: Errores de Medicación; Seguridad del Paciente; Servicios de Información de Medicamentos; Servicio de Farmacia del Hospital; Brasil

References

1. Silva CD, Coelho HL, Arrais PS, Cabral FR. [Drug information centre: contribution for rational use of drugs] Cad Saude Publica. 1997;13(3):531-535.
2. Ferracini FT, Mendes W, Filho B, Farmácia clinica: segurança na prática hospitalar. São Paulo: Atheneu; 2011.
3. Rede brasileira de centros e serviços de informação sobre medicamentos. Available at: http://rebracim.webnode.com.br/membros-rebracim/ (Accessed 1 March 2014).
4. Silva AEBC, Cassiani SHB. Erros de medicação em hospital universitário: tipo, causas, sugestões e providências. Available at: http://www.scielo.br/scielo.php?pid=S0034-71672004000600007&script=sci_arttext (Accessed 1 March 2014).
5. Miasso AI, Grou CR, Cassiani SHB, Silva AEBC, Fakih FT. Erros de medicação: tipos, fatores causais e providências tomadas em quatro hospitais brasileiros. Disponível em: www.scielo.br/pdf/reeusp/v40n4/v40n4a10.pdf (Accessed 1 March 2014).
6. National Coordinating Council for Medication Error Reporting and Prevention (NCCMERP). About medication errors. Available at: http://www.nccmerp.org/aboutMedErrors.html (Accessed 1 April 2014).
7. Lacasa C. Accidentes con medicamentos, conceptos, clasificacion y métodos de deteccion. In: Lacasa C, Humet C, Cot R. Errores de Medicacion – Prevencion, Diagnostico y Tratamiento. Barcelona: EASO; 2001.
8. RDC 36 DE 2013. Available at: http://bvsms.saude.gov.br/bvs/saudelegis/anvisa/2013/rdc0036_25_07_2013.html (Accessed 1 April 2014).
9. Portaria nº 2.647, de 4 de novembro de 2013. Available at: http://bvsms.saude.gov.br/bvs/saudelegis/gm/2013/prt2647_04_11_2013.html (Accessed 1 April 2014].
10. Cavallini ME, Bisson MP. Farmácia hospitalar: um enfoque em sistemas de saúde, 1ed. São Paulo: Manole; 2002.
11. American Society of Health-System Pharmacists (ASHP). Guideline on preventing medication errors in hospitals. Am J Hosp Pharm. 1993;50(2):305-314.
12. National Coordinating Council for Medication Error Reporting and Prevention (NCCMERP). About medication errors. Available at: http://www.nccmerp.org/medErrorCatIndex.html (Accessed 1 November 2011).
13. Institute for Safe Medication Practices (ISMP). ISMP's list of high-alert medications, 2012. Available at: http://www.ismp.org/Tools/institutionalhighAlert.asp (Acessed 1 October 2012).
14. Fahimi F, Ariapanah P, Faizi M, Shafaghi B, Namdar R, Ardakani MT. Errors in preparation and administration of intravenous medications in the intensive care unit of a teaching hospital: An observational study. Aust Crit Care. 2008;21(2):110-116. doi: 10.1016/j.aucc.2007.10.004
15. Kohn LT, Corrigan JM, Donaldson MS, eds. To err is human: building a safer health system. Washington: National Academy of the Institute of Medicine: 1999.
16. Protocolo coordenado pelo Ministério da Saúde e ANVISA em parceria com FIOCRUZ e FHEMIG (Anexo 3: Protocolo de segurança na prescrição, uso e administração de medicamentos). Available at: http://www.anvisa.gov.br/hotsite/segurancadopaciente/documentos/julho/Protocolo%20Identifica%C3%A7%C3%A3o%20do%20Paciente.pdf (Acessed 1 June 2014).

17. Carvalho VT, Cassiani SHB. [Medication errors and consequences for nursing professionals and clients: an exploratory study]. Rev Latino-Am Enferm. 2002;10(4):523-529.
18. Dalmolin GRS; Rotta ET; Goldim JR. Medication errors: classification of seriousness, type, and of medications involved in the reports from a University Teaching Hospital. Braz J Pharm Sci. 2013;49(4):793-802.
19. Walsh KE, Kaushal R, Chessare JB.How to avoid paediatric medication errors: a user's guide to the literature. Arch Dis Child. 2005;90(7):698-702.
20. American Society of Consultant Pharmacists (ASCP). Guidelines on preventing medication errors in pharmacies and long-term care facilities through reporting and evaluation. Available at: http://www.ascp.com/public/pr/guidelines/medication (Acessed 1 June 2006).
21. Kopp BJ, Erstad BL, Allen ME, Theodorou AA, Priestley G. Medication errors and adverse drug events in an intensive care unit: direct observation approach for detection. Crit Care Med. 2006;34(2):415-425.
22. Chapuis C, Roustit M, Bal G, Schwebel C, Pansu P, David-Tchouda S, Foroni L, Calop J, Timsit JF, Allenet B, Bosson JL, Bedouch P. Automated drug dispensing system reduces medication errors in an intensive care setting. Crit Care Med. 2010;38(12):2275-2281. doi: 10.1097/CCM.0b013e3181f8569b
23. Salazar N; Jirón M; Escobar L, Tobar E, Romero C. [Prospective assessment of medication errors in critically ill patients in a university hospital]. Rev Med Chile 2011;139(11):1458-1464.
24. Stavroudis TA, Shore AD, Morlock L, Hicks RW, Bundy D, Miller MR. NICU medication errors: identifying a risk profile for medication errors in the neonatal intensive care unit. J Perinatol. 2010;30(7):459-468. doi: 10.1038/jp.2009.186
25. Silva Md, Rosa MB, Franklin BD, Reis AM, Anchieta LM, Mota JA. Concomitant prescribing and dispensing errors at a Brazilian hospital: a descriptive study. Clinics (Sao Paulo). 2011;66(10):1691-1697.