ARTIGO ORIGINAL

REVISTA ENFERMAGEM ATUAL

Knowledge of nursing professionals about intravenous diazepam administration: a cross sectional study

Conhecimento de Profissionais de Enfermagem Acerca da Administração de Diazepam Intravenoso: estudo transversal

Ana Laura Biral Cortes[1]

Zenith Rosa Silvino[2]

Ney Roner Pecinalli[3]

[1] Enfermeira, Mestre em Ciências do Cuidado em Saúde pela UFF; Niterói, RJ-Brasil: analaurabiral@yahoo.com.br
[2] Enfermeira, Doutora em Enfermagem, Professora Titular na Escola de Enfermagem Aurora de Afonso Costa/UFF; Niterói, RJ-Brasil: zenithrosa@terra.com
[3] Enfermeiro, Mestre Biologia Celular e Molecular. Professor assistente no Instituto Biomédico/ UFF; Niterói, RJ –Brasil: neyrp@bol.com.br
* Artigo baseado em Trabalho de Conclusão de Curso de Graduação em Enfermagem e Licenciatura da Universidade Federal Fluminense/Niterói; defendida em 2013 por Ana Laura Biral Cortes.

REVISTA ENFERMAGEM ATUAL

ABSTRACT

The objective is to determine the level of knowledge of the nursing team in the preparation and administration of intravenous diazepam. Cross-sectional study in a University Hospital, where the preparation and administration of intravenous diazepam is performed at the nursing post by the nursing team. We interviewed 60 nursing professionals in the period of 30 days.

A low level of correct response was observed, where 74.5% of participants stated that the drug was diluted prior to administration and 40% prepared diazepam in different ways than those recommended in the product package. In the Intensive Care Center all professionals are unaware of the correct management of intravenous diazepam. The knowledge of the nursing team about the preparation and administration of intravenous diazepam is insufficient to guarantee a quality and harmless care.

Keywords: Patient Safety; Diazepam; Security Management.

Resumo

O objetivo é determinar o nível de conhecimento da equipe de enfermagem no preparo e administração do diazepam por via intravenosa. Estudo transversal em um Hospital Universitário, onde o preparo e administração do diazepam intravenoso é realizado no posto de enfermagem pela equipe de enfermagem. Foram entrevistados 60 profissionais de enfermagem no período de 30 dias.

Observou-se baixo nível de resposta correta, onde 74,5% dos participantes afirmaram diluir o medicamento antes de administrá-lo e 40% preparam o diazepam de maneiras diferentes das recomendadas na bula do produto. No Centro de Terapia Intensiva todos os profissionais desconhecem o manejo correto do diazepam intravenoso.O conhecimento da equipe de enfermagem sobre o preparo e administração de diazepam por via intravenosa é insuficiente para garantir um cuidado de qualidade e livre de danos.

Palavras-Chave: Segurança do Paciente; Diazepam; Gestão da Segurança.

REVISTA ENFERMAGEM ATUAL

Introduction

Since 2000, when the book "To Err Is Human: Building a Safer Health System" has been published worldwide, concern has been raised about health risks and patient safety [1]. that medication errors can occur in all parts of the process from prescription to drug dispensing, preparation, administration and monitoring [2].

In an integrative review in 2014, it was identified that the worldwide incidence of adverse events is high. Studies in the United States, Australia, the United Kingdom, New Zealand, Canada, the Netherlands and Sweden found that 2.9 to 16.6% of hospitalized patients were victims of adverse events, 50% of which were preventable. It was also observed that the majority caused mild deficiency, but it is emphasized that 4.9 to 13.6% of these events led to the death of the patient [3].

In a study carried out in 2012, which analyzed errors in the administration of intravenous drugs, high error rates were indicated for all categories and sectors evaluated. In some categories, 100% error was achieved. In addition, it is known that intravenous (IV) medications have immediate action and, in the event of an error, a greater and sometimes irreversible potential for harm. This pathway does not exhibit first-pass effect, the patient's response is fast and irreversible most of the time [4].

In a cross-sectional study conducted in a hospital in Brazil, which evaluated 735 hospitalizations, it was observed that in 353 of them there was at least one type of incident related to medication [5].

A systematic review conducted in Middle Eastern countries identified that medication error rates ranged from 7.1% to 90.5% for prescription and from 9.4% to 80% for medication administration [6].

In the US, in 2009, medication errors associated with IV drugs occurred even though they were prepared by the pharmacy service. Currently, health professionals responsible for the preparation and administration of IV drugs work in partnership [7]; in Europe, in most countries, nurses are responsible for the preparation and administration of IV drugs [8].

Studies in Brazil have identified rates of over 70% in errors that occur during the preparation and administration of intravenous drugs [4-9]. In 2003, the National Agency for Sanitary Surveillance (ANVISA) / 2003), which establishes the minimum requirements required for the use of Parenterals (SP) solutions in the Health Services, to ensure that these products, when administered, are safe and effective [10]. In this way, RDC No. 45/2003 determines that the preparation of SPs is an individual or joint activity of the nurse and the pharmacist and the administration, responsibility, of the nurse [10].

In spite of the high frequency of medication errors, in the preparation and administration of IV drugs and in the existence of a Brazilian resolution that determines that these drugs are prepared and administered by professionals who had access to scientific

REVISTA ENFERMAGEM ATUAL

knowledge in the field of Pharmacology during the training process; in clinical practice, it can be observed that, in most cases, nursing auxiliaries and technicians are responsible for such tasks.

It is known that benzodiazepines (BZDs) are among the most commonly used classes of medicines used in health services, widely used in developed countries such as USA (4 million people/year) and UK (1 million people/year); and that in such class of medicine diazepam is outstanding because it is extremely effective IV when properly prepared and administered [11].

It should be emphasized that dilution of diazepam is not recommended, as this leads to the precipitation of salts, and there may be no control of the actual amount administered. Diazepam remains stable in 5% or 10% glucose solution or in isotonic sodium chloride solution, provided the contents of the ampules are mixed rapidly (maximum 4 mL) to the total volume of solution (minimum 250 mL) using mixture after preparation [12-13], which does not characterize bolus administration.

In view of the high incidence of IV medication errors in Brazil, the devaluation of the ANVISA technical regulation (RDC no. 45/2003) in the practice of care and the lack of evidence in the nursing team literature on the preparation and administration of diazepam IV, it was believed that most of the professionals who participated in the study would be unaware of the correct preparation of diazepam.

Therefore, this study aimed to determine the level of knowledge of the nursing team in the preparation and administration of intravenous diazepam.

Method

This is a cross-sectional, quantitative and descriptive study carried out in a University Hospital under controlled conditions. Participants were invited to respond to a questionnaire that contained 5 questions to assess their level of knowledge regarding the preparation and administration of IV diazepam. The maximum filling time was 1 hour. This questionnaire was submitted for the evaluation of two professionals specialized in the subject, in order to validate the instrument. In addition, a pilot test was conducted with 5 professionals. It is important to highlight that at the preparation stage the medication was considered the attitudes related to the moment when it is under the responsibility of the nursing professional, more specifically to its removal from the vial, diluted or not, for subsequent injection into the patient. As administration the final step of administration, i.e., the intravenous bolus injection of the drug already prepared was considered.

The research participants were professionals of the nursing team of the institution, formed in its entirety by 160 nurses and 419 mid-level nursing professionals, according to the Nursing direction of the Hospital. The invitation was announced at the institution by the researcher in all sectors. Recruitment was not closed with a maximum or minimum number of participants and was carried

REVISTA ENFERMAGEM ATUAL

out concomitantly to the moment that preceded the collection in each sector. Of this amount (579 professionals), 62 people were on medical leave, 57 professionals were on holiday, 140 were night workers, during which time no data were collected; 78 did not have 1 year of experience. Of these professionals, only 60 accepted to participate of the research, since it demanded time to fill the instrument of data collection.

The inclusion criteria were: voluntary participation in the research, through the signing of the Informed Consent Term (TCLE) and having at least one year of experience. The excluded nursing professionals were those who did not belong to the permanent staff of the institution and who did not administer IV medication as part of their daily activity.

The data collection was carried out during the months of 06 to 07/2013. The following characteristics for contextualization were recorded: age, sex, profession and stocking unit within the hospital.

The drug knowledge test consisted of a questionnaire with five multiple-choice questions. They were related to the preparation and administration of diazepam. The objective was to know if during the preparation and/or administration of the drug it was diluted and if the preparation complied with the items recommended in the package insert.

The development of the study met national and international standards of research ethics involving human subjects. The project was submitted to the Research Ethics Committee for consideration and accepted under the opinion of No. 250139. To protect participants from all consequences resulting from the outcome, the data were made anonymous prior to analysis.

The information collected was organized in a database prepared in Microsoft Excel version XP. Data analysis was performed using descriptive statistics, with measurements of position (median) and variability (interquartile range).

Results

Characteristics of participants

A total of 60 nursing professionals participated in the study: 18 nurses, 39 Nursing technicians and 03 Nursing assistants. The mean age was higher among nursing auxiliaries (46 years). Most of the participants belonged to the medical clinic (35%) and were female (85%). All characteristics are summarized in Table 1.

Table 1. Demographic characteristics of nursing professionals. Niterói, RJ, Brazil, 2013.

Characteristics	Participants (n-60)	%
Female	51	85
Male	9	15
Age group		
18 – 28	9	15
29 – 39	40	66,6
50 -70	11	18,3
Profession		
Aux. Enf	3	5
Tec. Enf	39	65
Enf	18	30

REVISTA ENFERMAGEM ATUAL

Sector		
Medical clinic	21	35
CTI	6	10
Emergency	5	8,33
Maternity	8	13,33
Hematology	5	8,33
Surgery Center	10	16,66
Pediatrics	5	8,33

Source: data research.

Knowledge about the medicine: diazepam

Table 2 summarizes the knowledge about the preparation and administration of diazepam according to the characteristics of the participants.

All the interviewees answered the questions asked. Regarding the preparation and administration of diazepam IV, it was observed that the respondents obtained a low level of correct response, since 74.5% of the participants stated that they were diluted before administration and 40% prepared diazepam in different ways than those recommended by the drug description leaflet.

Table 2. Distribution of professionals according to the mode of preparation and administration of Diazepam according to demographic variables. Niterói, RJ, Brazil, 2013.

Characteristics	Preparo e administração correta n(%)	Preparo e administração incorreta n(%)
Female	12 (80)	39 (86,6)
Male	3 (20)	6 (13,4)
Age group		
18 – 28	1 (6,6)	8 (17,7)
29 – 39	9 (60)	12 (26,6)
50 -70	5 (33,3)	25 (55,5)
Profession		
Aux. Enf Tec. Enf	10 (66,6)	13 (28,8)
Enf	5 (33,3)	32 (71,1)
Sector		
Medical clinic	6 (40)	15 (33,3)
CTI	0	6 (13,3)
Emergency	2 (13,3)	3 (6,6)
Maternity	2 (13,3)	6 (13,3)
Hematology	1 (6,6)	4 (8,8)
Surgery Center	1 (6,6)	9 (20)
Pediatrics	3 (20)	2 (4,4)

Source: research data.

The current study revealed that the knowledge of the nursing staff about the preparation and administration of diazepam IV is insufficient to ensure quality and harmless care.

Discussion

Knowledge about Diazepam IV

The general knowledge about the preparation / administration of the drug was lower than expected. Regardless of the professional category (upper or middle level of nursing) to which the interviewee belonged, the occurrence of wrong answers was high. It is known that in Brazil nursing auxiliaries and

REVISTA ENFERMAGEM ATUAL

technicians do not have access during the course to the contents of pharmacology, but how to explain such errors in relation to nurses?

Thus, it is believed that because pharmacological considerations are performed by physicians the discipline of pharmacology is underestimated in the education of nurses [14]. As regards the age group, it was found that the younger professionals (18-28 years) and (> 50 years) are the ones that presented the most incorrect answers. It is understood that this fact can be explained by the stagnant and sometimes obsolete knowledge of older individuals and by the lack of experience in preparing and administering medications of the youngest. An international study has revealed that there is a greater propensity to error caused by more experienced professionals, since they make their decisions and judgments as correct, based on their professional experience, even when they are wrong [15].

It is known, however, that there is a need for training and updating of the nursing professional, given the complexity of the processes in which it is involved.

An integrative review carried out in 2012 highlights that preparation and professional training are factors cited as influencing medication errors [16].

Although drug preparation is a procedure that demands complex knowledge, it is common for nursing to do it as a simple task, assigning the same without distinction to helpers, technicians or nurses, since the task is understood as part of a routine. In this way, the inadequate management of medicines has aroused the attention of health professionals, mainly, due to its consequences. Several aspects may decrease microbiological safety or therapeutic efficacy in intravenous drug therapy when it is treated simply as routine[9].

If we analyze the responses based on the professional stocking sector we will be very concerned to realize that in a vital unit such as the Intensive Care Center (ICU) no one prepares and/or administers diazepam IV correctly.

It is questioned how the preparation and/or administration of other drugs should occur and if such fact cannot be directly influencing the prolongation of the hospitalization of the patient in this unit and costing the institution. A prospective study followed information from patients admitted to a teaching hospital and found that 54.8% of patients undergoing intensive care had a serious adverse event compared to 38.1% of patients in the ward. Another cross-sectional study, which discussed the technique of preparation of medications administered by catheter, on the part of the Nursing, in the ITC identified that the error rate was over 40% in all categories analyzed [17-18].

Conclusion

This study shows that knowledge about the management of diazepam IV for bolus administration is insufficient among the institution's nursing professionals and it is believed that this fact is a potential risk for the

REVISTA ENFERMAGEM ATUAL

patient in need of such medication, as regards the efficacy of the drug that can be lost when it is not prepared in the correct way.

In order to improve patient safety, it is necessary to take into account aspects such as: strengthening the general knowledge of nurses, in particular with regard to medication management; and nursing training programs (continuing education) focused on the area of pharmacology and on the gaps identified periodically and directed to the needs of each sector.

As a limitation of this study, a small sample is highlighted in relation to the professional population of the institution, since this sample was obtained for convenience because of the difficulties of the professionals to participate in the study at the moment of performing their activities in the hospital.

References

1. Kohn LT, Corrigan JM, Donaldson MS. To Err is Human. Building a Safer Health System. National Academies Press. Institute of Medicine. [Internet] 2000 [acesso em 08 fev 2015] Disponível: http://www.nap.edu/catalog/9728.html.

2. Nguyen EE, Connolly PM, Wong V. Medication safety initiative in reducing medication errors. J Nurs Care Qual. [Internet] 2010;25(3) [acesso em 03 mar 2015]Disponível: http://dx.doi.org/10.1097/NCQ.0b013e3181ce3ae4.

3. Nunes FDO, Barros LAA, Azevedo RM, Paiva SS. Patient safety: how has nursing been contributing to the issue? J. res. fundam. care. online. [Internet] 2014; 6(2) [acesso 03 mar 2015]Disponível: http://dx.doi.org/10.9789/2175-5361.2014v6n2p841.

4. Silva LD, Camerini FG. Analysis of administration of intravenous drugs in a sentinel hospital. Texto Contexto Enferm. [Internet]2012; 21(3) [acesso em 30 mar 2015] Disponível: http://dx.doi.org/10.1590/S0104-07072012000300019.

5. Paranaguá TTB, Bezerra ALQ, dos Santos ALM, Silva AEBC. Prevalence and factors associated with incidents related to medication in surgical patients. Rev.esc. enferm. USP. [Internet]2014; 48 (1) [acesso em 21 mar 2015] Disponível: http://dx.doi.org/10.1590/S0080-623420140000100005.

6. Alsulami Z, Conroy S, Choonara I. Medication errors in the Middle East countries: A systematic review of the literature. Eur J Clin Pharmacol. [Internet] 2013;69 (4) [acesso em 30 mar 2015] Disponível:http://dx.doi.org/10.1007/s00228-012-1435-y.

7. Shane R. Current status of administration of medicines. Am J Health-Syst Pharm.[Internet]2009; 66 (Suppl 3)[acesso em 01 mar. 2015]Disponível: http://.dx.doi.org/10.2146/ajhp0606.

8. Matthew L. Injectable medication therapy: a patient safety challenge. Nurs Stand. [Internet] 2007; 21 (31)[acesso em 01 mar.2015] Disponível: http://www.ncbi.nlm.nih.gov/pubmed/17472171.

9. Camerini FG, da Silva LD. Patient safety: analysis of the preparation of intravenous medication in a sentinel hospital. Texto Contexto Enferm. [Internet]2011; 20 (1) [acesso em 30 mar 2015] Disponível: http:// dx.doi.org/10.1590/S0104-07072011000100005.

10. Ministério da Saúde (BR). Resolução RDC n. 45, de 12 de março de 2003. Provides on the Technical Regulation of Good Practices for the

Use of Parenterals (SP) Solutions in Health Services. Brasília: Ministério da Saúde; 2003.

11. Rommers MK, Teeepe-Twiss I, Guchelaar HJ. Preventing adverse drug events in hospital practice: an overview. Pharmacoepidemiol Drug Saf. [Internet]2007; 16 (10) [acesso em 30 mar 2015] Disponível: http:// dx.doi.org/ 10.1002/pds.1440.

12. Portela JL. Intramuscular midazolam versus intravenous diazepam in the treatment of seizures in pediatric emergency [Dissertation]. Porto alegre (RS): Pontifícia Universidade Católica do Rio Grande do Sul, Faculdade de Medicina; 2011 [acesso 04 jul 2016].

13. Cristália, Produtos químicos e farmacêuticos LTDA. Patient label template. [Internet] 2014; [acesso em 05 jul 2016] Disponível em: http://www.anvisa.gov.br/datavisa/fila_bula/frmVisualizarBula.asp?pNuTransacao=10439932014&pIdAnexo=2318792.

14. King RL. Nurses' perceptions of their pharmacology educational needs. J Adv Nurs. [Internet] 2004; 45 (4)[acesso em 20 mar 2015]Disponível:http://dx.doi.org/10.1046/j.1365-2648.2003.02922.x.

15. Freitas GF, Oguisso T. Profile of nursing professionals and ethical occurrences. Acta paul. rnferm. [Internet]2007; 20 (4) [acesso em 20 mar 2015] Disponível: http://dx.doi.org/10.1590/S0103-21002007000400017.

16. Santana JCB, de Sousa MA, Soares HC, Avelino KSA. Fatores que influenciam e minimizam os erros na administração de medicamentos pela equipe de enfermagem. Rev. Enfermagem Revista. [Internet]2012; 15 (1)[acesso em 30 mar 2015]Disponível:http://periodicos.pucminas.br/index.php/enfermagemrevista/article/view/3300/3657.

17. Andrews LB, Stocking C, Krizek T, Gottlieb L, Krizek C, Vargish T, et al.An alternative strategy for studying adverse events in medical care. Lancet. [Internet] 1997;349 (9048) [acesso em 20 mar 2015]Disponível:http://dx.doi.org/10.1016/S0140-6736(96)08268-2.

18. Lisboa CD, Silva LD, Matos GC. Investigação da técnica de preparo de medicamentos para administração por cateteres pela enfermagem na terapia intensiva. Rev. esc. enferm. USP. [Internet]2013; 47(1)[acesso em 21 mar 2015] Disponível em: http://dx.doi.org/10.1590/S0080-62342013000100007.