

ADVERSE EVENTS AND NEAR MISSES IN HOSPITALIZATION UNITS OF A SPECIALIZED HOSPITAL IN CARDIOLOGY

EVENTOS ADVERSOS E INCIDENTES SEM DANO EM UNIDADES DE INTERNAÇÃO DE UM HOSPITAL ESPECIALIZADO EM CARDIOLOGIA

EVENTOS ADVERSOS E INCIDENTES SIN DAÑO EN UNIDADES DE INTERNACIÓN DE UN HOSPITAL ESPECIALIZADO EN CARDIOLOGÍA

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ABSTRACT

Objective: characterize the adverse events in hospitalization units of a reference hospital in cardiology in the state of Santa Catarina. **Method:** the study had quantitative, exploratory, descriptive approach, having as scenario a public hospital institution reference in cardiovascular care to para Santa Catarina. For data collection we used an instrument adopted by the institution to control notifications of adverse events, considering the period from September 2014 to September 2015. **Results:** this study analyzed 193 cases of adverse events occurred in 155 patients, which were predominantly related to a hematoma at the subcutaneous injection site, phlebitis in venipuncture, bed fall and stage II pressure ulcer. **Final considerations:** for the control of these events is of extreme importance to know the profile of these incidents and the affected patients, aiming to guarantee the quality management of the healthcare and a safe assistance.

Keywords: Nursing; Patient Safety; Thoracic Surgery; Health Care Quality, Access, and Evaluation; Quality Management.

RESUMO

Objetivo: caracterizar os eventos adversos em unidades de internação de um hospital referência em Cardiologia no estado de Santa Catarina. **Método:** o estudo teve enfoque quantitativo, exploratório, descritivo, tendo como cenário uma instituição hospitalar pública referência cardiovascular para Santa Catarina. Utilizou-se para a coleta das informações um instrumento adotado pela instituição para controle das notificações de eventos adversos, considerando o período de setembro de 2014 a setembro de 2015. **Resultados:** foram analisados 193 casos de eventos adversos ocorridos em 155 pacientes, os quais estavam relacionados predominantemente a hematoma no local de aplicação de medicação por via subcutânea, flebite em punção venosa, queda do leito e lesão de pressão grau II. **Considerações finais:** para o controle desses eventos é de extrema importância conhecer o perfil dos incidentes e dos pacientes acometidos, visando garantir a gestão da qualidade da assistência e o cuidado seguro.

Palavras-chave: Enfermagem; Segurança do Paciente; Cirurgia Torácica; Qualidade, Acesso e Avaliação da Assistência à Saúde; Gestão da Qualidade.

RESUMEN

Objetivo: caracterizar los eventos adversos en las unidades de internación de un hospital de referencia en cardiología del estado de Santa Catarina. **Método:** estudio exploratorio, cuantitativo, descriptivo realizado en un hospital público de referencia de Santa Catarina. La recogida de información se realizó de septiembre de 2014 a septiembre de 2015 a través de un instrumento adoptado por el hospital para controlar las notificaciones de eventos adversos. **Resultados:** se analizaron 193 casos en 155 pacientes, básicamente vinculados a hematomas en el sitio de aplicación de la medicación subcutánea, flebitis en la punción venosa, caídas de la cama y lesiones de presión grado II. **Consideraciones finales:** para controlar eventos adversos es

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sumamente importante conocer el tipo de incidentes y de pacientes involucrados, con miras a garantizar la gestión de la calidad asistencial y de brindar cuidados seguros.

Palabras clave: Enfermería; Seguridad del Paciente; Cirugía Torácica; Calidad, Acceso y Evaluación de la Atención de Salud; Gestión de la Calidad.

INTRODUCTION

The cardiovascular diseases (CD) are responsible for an increasing number of hospitalizations. In 2015 the hospitalizations due to CD in the Brazilian *Sistema Único de Saúde* (SUS) were 516,163 and expenses of R\$ 1,593,806,957.52 with these patients.¹ In the state of *Santa Catarina*, in the same year, 1,300 patients with CD were hospitalized in the public health services, having an average cost per patient of R\$: 3,800.00.¹ Taking into account the extended periods of hospitalization to which these patients are subject in the face of the repercussions of the disease,² this number causes a major impact on the economy of the country, in addition to leaving the patient subject to possible adverse effects. This, beyond of being a complicating factor for the treatment clinical conduction, is associated with the significantly longer hospitalizations when compared to patients who did not have them.³

According to the World Health Organization (WHO),⁴ the adverse events (AE) are considered incidents that result in harms, unintentional and unrelated to the natural history of the underlying disease, while a near miss is an event that occurred, but has not yield a discernible harm to the patient.⁴ In this sense, in 2004 the WHO created the World Alliance for Patient Safety, which defined five goals to the patient's safety: identifying it correctly, improving the effectiveness of communication among the care professionals, improving the safety of high-alert medications, ensure surgeries at the correct intervention site, ensure correct patient and procedure and reduce the risk of infections associations associated with the health care.⁵

In Brazil, in April 2013, the *Ministério da Saúde* (BR) created, through Ministerial Directive no 529/13, the *Programa Nacional de Segurança de Paciente* (PNSP), in response to the society and professionals's call for a safe attention, in the sense of reducing incidents that produce harms to subjects. With regard to PNSP, the safe care needs for a safety culture, that extends the emphasis on the professional performance, encouraging a responsible, ethical practice and that assess the errors and incidents included in the notifications, becoming a source of learning.⁶

In this context, the nursing performance is crucial in preventing these events, as it comprises the largest quantitative of professionals involved in the care offered in hospital institutions 24 hours a day, being the nurse responsible for creating strategies for improving the patient's safety and errors prevention,⁷ being stressed the Brazilian *Rede Brasileira de Enferma-*

gem e Segurança do Paciente, that aims to strengthen the safe and qualified nursing care.

The rates of AE in hospital institutions may be used as safe care and quality indicators of Nursing care, as well as the basis for creating improvement strategies of the patient's care and safety.⁸ Moreover, as an inductor element of safe practices, the record and evaluation of the AE may identify/orient practices of permanent education in order to qualify the health professionals' clinical practice,⁹ resulting directly in better health indicators.

In face of this scenario, we question about what are the adverse events that occur in hospitalization units of a hospital reference in Cardiology. Aiming to contribute with the evaluation process of the practice in health and provide elements that enable identifying potential fragilities in the clinical practice of the nursing team, it aims to characterize the adverse events and near misses in hospitalization units of a hospital reference in Cardiology in the state of *Santa Catarina*.

METHOD

ETHICAL ASPECTS

This research used secondary data of adverse events in hospitalization units of a cardiology hospital, after approval by *Comitê de Ética em Pesquisa* under the *Certificado de Apresentação para Apreciação Ética* (CAAE): 59851516.8.0000.0121.

DESIGN, PLACE OF STUDY AND PERIOD

Quantitative, exploratory, descriptive study, carried out in a public hospital reference in cardiovascular care to *Santa Catarina* in the period of September 2014 to September 2015.

SAMPLE, INCLUSION AND EXCLUSION CRITERIA

For data collection we used an instrument from the institution for notifications of adverse events. In this way, all the instruments registered in the sector during the period were included, since none of them met the exclusion criteria: presence of illegible letter and erasures, absence of defining information of the adverse events and damaged and/or incomplete.

STUDY PROTOCOL

The variables considered for this study were sex, age, length of permanence in the institution until the occurrence of the adverse event, shift in which it has occurred and the characterization of the type, separated by their particular categories, such as: pharmacosurveillance (lack or reduction of

therapeutic effect or deviation from quality and adverse reaction), error (identification of where and when it occurred), falls (identification of the type, local, damage, presence of caregivers), unintentional tube/catheter exteriorization (identification of device and motives), infections related to health assistance (identifying facilitator via and motives), venipunctures and arterial punctures (identifying local and facilitator motives) and pressure injury (sector of development of the lesion and stage). Specifically in relation to the injury stage, these were classified in stage I (intact skin, with non-blanchable redness, usually over a bone prominence), stage II (superficial wound with red/pink without slough or closed or open blister), stage III (wound with subcutaneous tissue exposure, but not exposed bones, tendons or muscles) and stage IV (exposition of bones, tendons or muscles, may be undermining and fistulating). The data were organized from the Microsoft Excel® spreadsheet program.

RESULTS AND STATISTICAL ANALYSIS

The data were analyzed by means of the descriptive and inferential statistics, using the chi-square test to compare the percentages among the groups; the Student *t* test to compare the continuous variables; and variance analysis followed by Tukey multiple comparisons test to compare average of more than two groups. For the statistical tests it was assumed the significance value of 0.05, which is equivalent of confidence of 95%. For such analysis we used the Software SAS version 9 and a statistical support.

RESULTS

The study analyzed 190 cases of adverse events occurred in 155 patients of 487 attended in the period from September 2014 to September 2015. The sample of the female gender consisted of 81 patients (52.3%) and the one of the male gender was 74 patients (47.7%), the age was between 18 and 101 years, in which the median was maintained in 66 years.

With regard to the occurrence of AE, the median of time was 20 days (44.7%), with minimum time of zero day and maximum of 208 days after the hospitalization. It is also observed that the majority of the events occurred in the early shift (31.7%) followed by the evening period (26.8%) (Table 1).

Of the 190 notifications, 26.3% were due to medication error, being 40% linked to hematomas from subcutaneous drugs administrations (SC), being, therefore, considered adverse events. The other records did not describe immediate or late harm related to the error in the drug administration, as is presented in the Table 2. The most errors involving drugs occurred in the morning period (36%).

Table 1 - Sociodemographic characterization, of time for the occurrence of incidents with and near misses and shift. Florianópolis, Brazil, 2015

Variables	N	%
Time until the adverse event (days)		
0 a 10	43	22.6
11 a 20	42	22.1
21 a 30	20	10.5
31 a 40	16	8.5
41 a 50	6	3.1
51 above	34	17.9
Without record	29	15.3
Total	190	100.0
Shift of the incident		
Morning	60	31.7
Afternoon	51	26.8
Evening	30	15.8
Without record	49	25.7
Total	190	100

Table 2 - Records of errors with and near misses related to the drugs administration. Florianópolis, Brazil, 2015

Variables	N	%
Medication errors with harm (AE)		
Hematoma due to drug administration	20	40.0
Near misses*		
Drug not administered	16	32.0
Wrong dosis	7	14.0
Wrong timetable	2	4.0
Infusion rate	1	2.0
Wrong patient	2	4.0
Wrong drug	2	4.0
Shift of the incidents		
Morning	18	36.0
Afternoon	6	12.0
Evening	12	24.0
Without record	14	28.0
Total of medication errors	50	100

With regard to the adverse events related to the venipuncture, these represented 18.9% of the notifications. As a result, the patients had phlebitis, seroma and/or hematomas. There was a predominance in the female gender (63.9%) in the age group between 61 and 70 years. Of these adverse events, 91% were investigated in accordance with the institutional protocol and the patient was oriented about the occurred (Table 3).

Table 3 - Records of adverse events related to puncture

Variables	N	%
Adverse events related to venipuncture		
Phlebitis	18	50.0
Hematoma	16	44.4
Seroma	2	5.6
Shift		
Morning	6	16.7
Afternoon	16	44.4
Evening	4	11.1
Without record	10	27.8
Total	36	100

The falls were responsible for 10.5% of the adverse events in the studied period. We observed a greater prevalence in male patients, in which the most aged between 61 and 70 years. The registration of falls presented higher in the evening period (40.0%). Of the total falls recorded in the data collect period, 65.0% presented harms, ranging from small lesions to cases of bone fractures.

It should be emphasized that, of the total number of notifications due to fall, 65% were investigated and shows that in 45.0% of cases the patients were with companions, but only 15.0% had the plaque with indication of risk for fall of bed, according to the records.

Of the total number of bed falls, it is important to mention that there was predominance of 45% of cases of bed falls followed by 35% of falls from a height. The other 20% were divided between falls from the toilet bowl and falls from the armchair. Of the total number of falls, it is important to point out that there was predominance of 45% of cases of bed falls followed by 35% of falls from a height. The other 20% were equally divided between falls from the toilet bowl and falls from the armchair.

Table 4 - Relation between falls occurred with regard to the patient's gender and the shift of the occurrence of the event. Florianópolis, Brazil, 2015

	Occurrence of falls		
	No n(%)	Yes n (%)	P value*
Gender			
Male	61	13	0.06
Female	74	7	
Shift			
Morning	56	4	0.02
Afternoon	45	6	
Evening	22	8	
Without record	47	2	
Total	135 (100)	20(10.5)	

* Chi-square test

The cases of pressure injury represent 6.8% of the notifications, being that 69.2% of these were in stage II and 54% were registered in the coronary unit. It is said that the most cases occurred in male patients (61.6%), aged between 71 and 80 years (30.8%). Regarding the investigation process of this event, in all the cases the protocol of the unit was carried out according to the need and stage of the pressure injury (Table 5).

Table 5 - Registrations of adverse events related to pressure lesion. Florianópolis, Brazil, 2015

	n	%
Apparent skin lesion		
Yes	13	65.0
No	7	35.0
Presence of companion		
Yes	9	45.0
No	8	40.0
Without record	3	15.0
Shift		
Morning	4	20.0
Afternoon	6	30.0
Evening	8	40.0
Without record	2	10.0
Pressure lesion		
Stage I	1	7.7
Stage II	9	69.2
Stage IV	2	15.4
Without record	1	7.7
Place of origin		
Coronary unit	7	54.0
Emergency	5	38.5
Without record of place	1	7.6
Pressure injury Total	13	100

DISCUSSION

According to the WHO, the patient's safety corresponds to the reduction to the minimum acceptable of the risk of unnecessary harm associated to health care.⁵ With regard to the patient with CD, a study aimed to evaluate the trends of rates of adverse events among hospitalized patients with myocardial acute infarction, congestive heart failure, pneumonia or conditions that require surgery in the United States and Puerto Rico showed that the reason of chances for death among patients with one or more adverse events, compared to patients without adverse events was 1.24 (IC 95%: 1.01 to 1.51) for myocardial acute infarction and 1.77 (IC 95%: 1.36-2.29) for congestive heart failure.³

Among the cited incidents, it presents the error in the drug administration, with harm and near miss, which has been identified in several national and international studies with a great incidence.^{9,10}

This study presented 26.3% of records of medication errors, in the period of one year, being 32% of them as cases of non-administered medication, for numerous reasons, since the fact of the drug has been checked previously until the drug is not available.

The predominance of records of medication errors with harms found in this research was related to hematomas in the administration of subcutaneous drugs, such as enoxaparin, totaling 40% of the cases, many due to the incorrect record in the protocol of rotation of the patient's drug. The hematoma is a very frequent complication from this route, and may produce pain and local discomfort, edema and even infection when the asepsis is done in an incorrect way. The recommended in this route is that the local of application is altered each application or up to 72 hours, if there is no change.¹¹

In the state of São Paulo, research related to the medication error affirm that approximately 23% of the medication errors were related to the dosage, followed by 22% related to errors at the timetable of the drugs administration.¹² The errors with dosage of medication in the present study had lower rates, being 14%. Regarding time of the medication, the rate was 4%. This fact can point out some improvement on providing care, however, there are still many cases of underreporting, which may also justify the low number presented in the study. The medication errors may many times be caused by the not following of the nine rights of the medication: right medication, right patient, right dose, right route, right time, right record, right action, right form and right answer.² However, the cause of errors may still be related to failures in the communication process among professionals, and may aggravate the patient's situation.¹⁰

With the aim at reducing and preventing the number of errors, measures are necessary such as the improvement of the communication, the compliance of policies and procedures related to the preparation and administration of drugs and still the carrying out of trainings that let the professionals aware of the risks and updated about new drugs. It is also required the carrying out of trainings about administration techniques and even new procedures, stimulating the continuing education in the health institutions.

The creation of strategies of construction of technical-scientific knowledge that involve issues of the daily of the institutions and search for articulation with the guidelines of health policies has shown good results as for the process of qualification and reduction of harms.¹³

Beyond of the medication errors, other adverse event that occurred in 18.9% of cases were the complications due to venipunctures, of which their main causes were the phlebi-

tis, hematomas and seroma, respectively. In the clinical practice we are faced with the complications associated to venipunctures that are underestimated by the nursing team. This aspect is confirmed by study carried out with 76 patients with the aim at identifying the frequency and causes of the phlebitis in a general hospital in the *Vale de Paraíba*, which revealed incidence of phlebitis in 24 of 76 patients, around 35.5%.¹⁴ The phlebitis is one of the most frequent complications and considered as one of the main failures of the infusion. It can occur both by the insertion technique of the catheter, and by physical-chemical properties of the administered fluid. It is characterized by acute inflammation of the vein, which causes edema, pain, discomfort and erythema around the puncture.^{14,15} In this study, the phlebitis was responsible for 50% of cases of AE related to peripheral venipunctures.

For the realization of the peripheral venipuncture, the nursing team must have technical-scientific knowledge about the subject, with particular care with the placement and maintenance of the peripheral catheter to be inserted and mainly with the drug technique that will be carried out.¹⁶

The prevention for the complications related to the venous access is associated to the steps that antecede the procedure, such as hand washing, choice of the appropriate material, selection of the veins, correct realization of the antiseptis, rotation each 72 hours from the punctured site, appropriate fixation to prevent rash and exteriorization.^{14,17} It is important to stress that the choice related to the sites, gauge and prevention of complications if under the responsibility of the nurse.¹⁶

One of the main adverse events to be prevented in health institutions is the risk for falls in hospitalized patients,¹⁸ mainly when they are of the third age. In our study, the value relating to the falls in the period of one year was 10.5%. And 50% of the patients that suffered falls were 61 to 70 years, with predominance of 65% in the male gender, 40% of the cases in the evening shift and 45% of the records regarding bed falls.

Regarding the data of research carried out in *Porto Alegre*, 51% of the patients who suffered falls were male, 57% had age above 60 years and 56.6% occurred in the evening period, being that 43.40% of the falls did not cause any type of harm visible to the patient and 41.51% caused harms that involve a few or no care. The other 15% of the records were harms that led since distension and fractures until the death,¹⁸ corroborating, until a certain point, the results of this study. Other similar result among the researches was the shift in that occurred the events, being 40% of the records of the present study occurred in the evening shift. Despite the investigation presenting predominance of the male gender, this does not represent a risk factor. This result may occur due to one cultural issue of the men in our environment that do not accept or feel comfortable in calling for aid to carry out tasks that

are realized on the daily. The fact that the patient is not in its usual environment, with close persons may also make it uncomfortable in asking for aid. In the evening shift it can still consider the fact that in general in this period the number of professionals is reduced, decreasing the surveillance and the visits in the room.¹⁸

In order to prevent falls occur, several steps could and should be done, such as the presence and elevation of grids in patients who suffer this risk, the containment in the bed, if it is really necessary and bring them no other harm, the signaling in the medical records and room, with plaques and bracelets that indicate the risk and the follow up of the safety protocol of the patient monitored by the unit.¹⁹ These attitudes tend to reduce the harms caused by this grievance. The specific care related to the physical structures of the institutions should also be stimulated by the public power and relatives, since they are considered risk factors for falls.²⁰

One of the most common causes of the increased permanence in hospitals is the appearance of alterations in skin. The pressure injuries cause difficulty in the patient's recovery process, increase the risk of development of other complications and still cause increase of physical and emotional suffering of the patients. Its incidence increases in proportion to the combination of the risk factors, of which it highlights the advanced age and the restriction to the bed.^{19,21}

In this study, 13 (6.8%) of the adverse events records were related to the pressure injury. This value is similar to the one found in a study carried out in an university general hospital in *Goiânia*, whose index was 4.9%.²²

According to data from the National Pressure Ulcer Advisory Panel, in the EUA, the pressure injury prevalence in hospitals is 15% and the incidence is 7%. Already in the United Kingdom new cases affect 4 to 10% of the patients admitted to the hospital.²² Work conditions, considering the appropriate number of professionals and materials, as well as the patient's clinical condition, influence significantly in the process of development and care of these lesions. In the present study 69.2% of the records of pressure injuries in stage II were identified, with a predominance in patients aged between 51 and 80 years and male (61.6%). In study carried out in *Fortaleza* (BR), 34.7% of records are patients aged between 73 and 83 years. Just in *São Paulo*, 34.4% of patients with pressure injury were found, being that, of these, 68.4% were in stage II and were above 60 years.²³

The pressure injuries arise when there is not the correct carried out of the preventive measures, as well as the lack of adequate resources and materials.²² As a way of prevention, is of crucial importance the adoption of measures such as the position change every two or three hours or still, with regard to the patient's need, the use of own materials for these care,

such as pads, body cleanliness and hydration, nutritional conditions control and water intake.²⁴ It is also suggested that the multi modalities initiatives use of prevention has impact on the pressure injury reduction, which include the simplification and standardization of specific interventions for this adverse event and its documentation, the involvement of multidisciplinary teams and the development of clinical leadership, use of appropriate coverages for the lesions, continuing education, auditory and supported feedback.²⁴ A complementary action to the control of the adverse events, the management of the pressure injury risk provides the recognition of opportunities of restructuring of protocols, aiming at the quality care and better health practices.²²

LIMITATIONS OF THE STUDY AND CONTRIBUTIONS TO THE NURSING, HEALTH OR PUBLIC POLICY AREAS

Although this study has as limitations the use of secondary data that originate from the professional registry, which originate from the professional records, which may be subject to the sub-notification, we considered all the institutional adverse events notification instruments.

The Nursing has considerable importance in the prevention of adverse events, reviewing factors that contribute to a greater theme's dissemination and visibility, aiming at increasing the control so that they do not occur. Therefore, the knowledge of the incidents' and the profile of patients affected may direct the clinical practice and risk management for refining the institutional, regional and national parameters, with the perspective of expanding the reach of local actions of the patient's safety nuclei and public health policies.

FINAL CONSIDERATIONS

The results reveal that the adverse events are still very present in hospitalization units, extending the stay of the patient and exposing it to new risks. The main adverse events cited in this study are related to hematoma at the subcutaneous injection site, phlebitis in venipuncture, bed fall, stage II pressure ulcer and surgical site infection.

The adverse events constitute a potent tool for a quality management, acting as a strong indicator of the provided care, being possible to evaluate the errors, whether with damages or not, investigate the prejudices to the patient's health and propose change and development strategies of the services. The safe care requires a safety culture among the professionals, and consequently it is necessary to extend the permanent education strategies, assessing the conditions and the work processes.

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