

PRESSURE ULCER IN INTENSIVE CARE UNIT: ANALYSIS OF INCIDENCE AND INJURIES INSTALLED*

ÚLCERA POR PRESSÃO EM UNIDADE DE TERAPIA INTENSIVA: ANÁLISE DA INCIDÊNCIA E LESÕES INSTALADAS

ÚLCERAS POR PRESIÓN EN UNIDAD DE CUIDADOS INTENSIVOS: ANÁLISIS DE LA INCIDENCIA Y LESIONES INSTALADAS

Maria do Livramento Neves Silva¹, Rafaela Trindade do Ó Caminha², Simone Helena dos Santos Oliveira³, Edienne Rosângela Sarmiento Diniz⁴, Joab de Lima Oliveira⁵, Vanusa Sabino do Nascimento Neves⁶

A longitudinal quantitative study carried out in the Intensive Care Unit of a public hospital in João Pessoa-PB, Brazil, from July to October 2012, which aimed to analyze the incidence of pressure ulcers and describe their characteristics. We monitored 36 patients who met the inclusion criteria. Data collection happened through physical examination and medical records. We verified that 22.2% of patients developed the injury, affecting equally men and women (50.0%), with predominance of Caucasians (62.5%) and aged under 50 years (30.8%), which developed the injury in less than ten days (87.5%), in the sacral region (27.3%) and classified in category II (63.6%). Despite investments in devices for prevention and treatment of pressure ulcers, these are still present in practice and with significant incidence. Therefore, we suggest investing in professional training, as well as develop and implement protocols for preventing this injury.

Descriptors: Pressure Ulcer; Intensive Care Unit; Incidence.

Estudo longitudinal, quantitativo, realizado em Unidade de Terapia Intensiva de hospital público de João Pessoa-PB, no período de julho a outubro de 2012, com o objetivo de analisar a incidência de úlceras por pressão e descrever suas características. Foram acompanhados 36 pacientes que atenderam aos critérios de inclusão. Os dados foram coletados através de exame físico e consulta aos prontuários. Evidenciou-se que 22,2% dos pacientes desenvolveram a lesão, afetando igualmente os gêneros (50,0%), prevalecendo a raça branca (62,5%), com idade de até 50 anos (30,8%), que desenvolveram a lesão em menos de 10 dias (87,5%), na região sacral (27,3%) e classificadas na categoria II (63,6%). Apesar dos investimentos em dispositivos para prevenção e tratamento das úlceras por pressão, estas continuam presentes na prática e com incidência significativa. Sugere-se investir em qualificação profissional, bem como construir e implantar protocolos para prevenção desse agravo.

Descritores: Úlcera por Pressão; Unidade de Terapia Intensiva; Incidência.

Estudio longitudinal, cuantitativo, realizado en unidad de cuidados intensivos de hospital público de João Pessoa-PB, Brasil, de julio a octubre de 2012, con el fin de examinar la incidencia de las úlceras por presión y describir sus características. Se siguieron 36 pacientes que cumplieron los criterios de inclusión. Los datos fueron recolectados a través del examen físico y registros médicos. 22,2% de los pacientes desarrollaron lesiones que afectaron por igual a ambos sexos (50,0%), con prevalencia de la raza blanca (62,5%), con edades hasta 50 años (30,8%), que desarrollaron lesiones en menos de 10 días (87,5%), sacros (27,3%) y en la clase II (63,6%). A pesar de las inversiones en dispositivos para prevención y tratamiento de las úlceras por presión, éstos están todavía presentes en la práctica y con impacto significativo. Se sugiere invertir en la formación profesional, crear e implementar protocolos para la prevención de estos agravios.

Descriptor: Úlcera por Presión; Unidad de Cuidados Intensivos; Incidencia.

*Extracted from the dissertation "Incidence, prevalence and factors associated with pressure ulcers in intensive care unit", Graduate Program in Nursing, Universidade Federal da Paraíba, 2013.

¹Nurse, Master, Hospital Edson Ramalho. João Pessoa, PB, Brazil. E-mail: marialns2010@hotmail.com

²Undergraduate Nursing student, Universidade Federal da Paraíba, PIBIC/CNPq scholarship. João Pessoa, PB, Brazil. E-mail: rafaelatrindadem@yahoo.com.br

³Nurse, PhD, Professor, Universidade Federal da Paraíba. João Pessoa, PB, Brazil. E-mail: simonehso@yahoo.com.br

⁴Nurse, Master, Hospital Arlinda Marques. João Pessoa, PB, Brazil. E-mail: enesarmento@hotmail.com

⁵Statistician, PhD, Professor, Universidade Federal da Paraíba. João Pessoa, PB, Brazil. E-mail: joab_oliveira@yahoo.com.br

⁶Nurse, Master's student, Universidade Federal da Paraíba. João Pessoa, PB, Brazil. E-mail: vanusasabino@gmail.com

INTRODUCTION

The number of patients who develop pressure ulcers (PU) during the hospitalization period has caused great concern in health professionals, researchers and experts in the field, because it is usually a preventable problem. Such a problem, when installed, results in high costs for health care institutions, besides causing physical and psychological suffering for the patient and their family⁽¹⁾.

Going through the literature on the subject, we find several definitions for these injuries, but all refer to the National Pressure Ulcer Advisory Panel (NPUAP), considered one of the most accepted. It defines PU as a localized area of cell death, which develops when skin and/or underlying tissue is compressed, usually over a bony prominence, as a result of pressure, or pressure in combination with friction and shear⁽²⁾.

In recent years, we have verified an increase in research and investments for the acquisition of new products and/or devices for the prevention and treatment of pressure ulcers. However, the international literature still presents a prevalence ranging from 4% to 49%, and an incidence ranging from 3.8% to 12.4% in critical care environment⁽³⁾. In Brazil, studies have evaluated the incidence and prevalence of PU in the hospital environment, long-stay institutions and homes, revealing that the numbers vary depending on the scenario and the profile of the patients, with an incidence between 3.6% and 66.6%⁽⁴⁻⁵⁾.

In the context of intensive care, the occurrence of pressure ulcers (PU) can present higher numbers due to the patients' severity, frequent therapeutic procedures, immobility in bed, connection of specific devices, loss of muscle mass and long periods of hospitalization⁽⁶⁾.

In a prospective study conducted in three ICUs of a university hospital in São Paulo/SP, Brazil, it was identified a PU incidence of 31%⁽⁷⁾. Another study carried out in the ICU of a large university hospital, located in the interior of the São Paulo State, monitored

48 patients for four months and found that 62.5% developed PU⁽⁸⁾.

Given the problem of PU in ICUs and aiming to outline an overview of the situation of a service to support actions and patient care, we established the following objectives: to assess the incidence of pressure ulcers and describe their characteristics.

METHOD

This is a descriptive longitudinal study with quantitative approach conducted at the ICU of a medium-sized public hospital in João Pessoa, Paraíba, Brazil. This hospital aims to treat the general population of the capital and other cities of the State. The ICU has seven beds and receives medical and surgical patients coming from the hospital itself or referred by the state regulatory system.

The study population consisted of 57 patients admitted in the ICU from July to October 2012. The sample comprises 36 (63.2%) patients who met the following inclusion criteria: be over 18 years of age, do not present PU at admission, remain hospitalized for at least 24 hours, and undergo at least two evaluations.

For data collection, we used two instruments: a form addressing demographic and clinical aspects, applied in the first patient evaluation; and a follow-up form of the patients' clinical conditions and skin characteristics, used in subsequent evaluations.

The research project was submitted to the Research Ethics Committee of the Universidade Federal da Paraíba, being approved under Protocol No. 023/12. Data collection happened after informing the patient and/or legal guardian of the aims of the research, as well as after they signed the Informed Consent Form.

The collected data were entered into Microsoft Excel for Windows, and later transferred to the software PASW Statistic, version 18, where a descriptive data analysis was conducted. The results were presented in tables and figures.

RESULTS

From July 17 to October 17, 2012, we monitored 36 patients admitted at the ICU without presenting PU. Eight of these developed 11 injuries, representing an incidence of 22.2%.

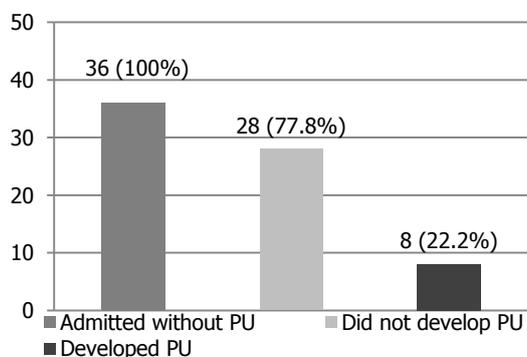


Figure 1 - Incidence of pressure ulcers in ICU patients. João Pessoa, PB, Brazil, 2013

Source: Direct research

As for the patients who developed PU after hospitalization, we verify in Table 1 that men and women were equally affected (50.0%), with predominance in Caucasians (62.5%) and those under 50 years of age (50.0%). Concerning the clinical characteristics of the group that developed the injury, most of them had respiratory disorders (50.0%) as medical diagnosis for hospitalization, and remained hospitalized in the ICU for more than ten days (62.5%).

Table 1 - Demographic and clinical characteristics of ICU patients, according to the development of pressure ulcers. João Pessoa, PB, Brazil, 2013

Variables	Development of PU				Total	
	Yes (8)		No (28)		n	%
	n	%	n	%		
Sex						
Female	4	50.0	11	39.3	15	41.7
Male	4	50.0	17	60.7	21	58.3
Race						
Caucasian	5	62.5	16	57.1	21	58.3
Non-Caucasian	3	37.5	12	42.9	15	41.7
Age group						
≤ 50	4	50.0	9	32.1	13	36.1
51 to 70	2	25.0	12	42.9	14	38.9
≥ 70	2	25.0	7	25.0	9	25.0
Length of hospitalization (days)						
< 10	3	37.5	15	53.6	18	50.0
≥ 10	5	62.5	13	46.4	18	50.0
Medical diagnosis of hospitalization (main)						
Respiratory disorders	4	50.0	10	35.7	14	38.9
Cardiovascular dysfunctions	2	25.0	7	25.0	9	25.0
Postoperative	2	25.0	11	39.3	13	36.1

Source: Direct research

As shown in Figure 2, of the eight patients who developed PU after ICU admission, four cases (50.0%) occurred between six and ten days, and three (37.5%) within five days.

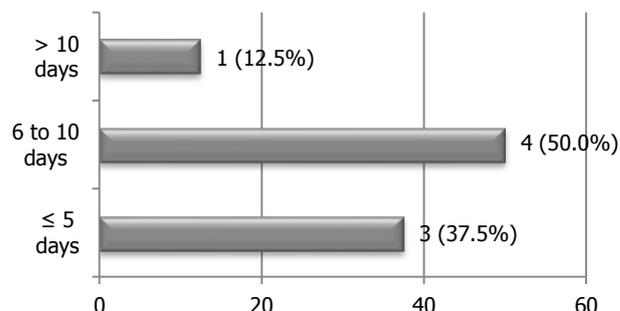


Figure 2 - Elapsed time for the development of pressure ulcers after ICU admission. João Pessoa, PB, Brazil, 2013

Source: Direct research

Concerning the location of PU, the sacral region predominated with three cases (27.3%) and the dorsal region with two (18.2%). The other injuries occurred in different places. Regarding the stage of evolution of PU, according to the NPUAP classification (2009), there was prevalence of category II, with seven patients (63.6%).

Table 2 - Characteristics of pressure ulcers developed in ICU patients. João Pessoa, PB, Brazil, 2013

Variables	n	%
Topographic location		
Sacral	3	27.3
Dorsal	2	18.2
Others*	6	54.6
Classification (NPUAP)		
Category/Stage I	2	18.2
Category/Stage II	7	63.6
Suspected deep tissue injury	2	18.2
Total injuries	11	100.0

*One occurrence registered for each region (gluteus, trochanter, calcaneus, plantar, inner thigh and nose).

Source: Direct research

Another important finding of this study was the high death rate among patients who developed PU (75%).

DISCUSSION

The damaging effects of pressure ulcers are undeniable, being of multifactorial causes and with occurrence related to the presence of some risk factors, affecting certain groups of more vulnerable patients and increasing morbidity and mortality.

In this study, of the 36 patients admitted to the ICU without the injury, eight would later develop 11 injuries, representing an incidence of 22.2%. This incidence registered in three months of monitoring the patients in the study, although high, illustrates lower values than those found in other studies conducted in ICUs of public and private hospitals in Brazil⁽⁷⁻¹⁰⁾. Among these, we highlight one held in the General ICU of a Public Hospital of Brasília/DF, revealing a PU incidence of 37.0% after monitoring patients for two months⁽⁹⁾ and another one conducted for one month in a non-government hospital of Santos/SP, which monitored 30 patients admitted in the ICU, detecting an incidence of 36.7%⁽¹⁰⁾.

These data reinforce that pressure ulcers represent a serious problem in this ICU, despite the material resources for its prevention and the technical training of human resources implemented in an attempt to reduce these numbers. The PU incidence in this study, although lower than those found in the research mentioned, is still far from results detected worldwide. A research conducted in the ICU of a Cuban hospital identified an incidence of 9%. The most prevalent measures adopted by the nursing staff were skin care, postural changes, and use of the Norton scale to identify patients more likely to develop PU, in addition to planning interventions⁽¹¹⁾.

As for the demographic characteristics of patients who developed PU, we found that men and women were equally affected, with predominance of Caucasians and people aged under 50 years. Regarding gender, some studies show higher occurrence of PU in males⁽¹²⁻¹³⁾, while other in females^(10,14), however, without identifying

a statistically significant difference for this variable, in most cases.

With regard to the age identified in the group who developed PU in this study, it is probably because these patients have remained hospitalized for longer periods (24 days on average), having respiratory disorders as the medical diagnosis for hospitalization (50.0%), and who were using vasoactive drugs and corticosteroids, which together can contribute to the onset of PU. In the group that did not develop this injury, the main reason for admission was postoperative (39.3%) and they remained hospitalized for 13 days on average, which may have contributed to the non-appearance of ulcers, once they presented more stable clinical conditions.

Nevertheless, it is important to emphasize that the literature refers to age as one of the most important factors for the onset of PU, due to changes that occur in the characteristics of skin and subcutaneous tissue over the years, favoring the formation of ulcers⁽¹²⁾.

Concerning the analysis of hospital stay and the elapsed time for the development of injuries, we found that PU emerged mostly within ten days of hospitalization (87.5%) and that these patients remained hospitalized for a longer period than that. Thus, it appears that these injuries may occur early in severe patients, contributing to increase the length of stay and therefore requiring planned, continuous and effective actions from the multidisciplinary team from the first hours of admission. A study conducted in a General ICU of a Public Hospital in the Federal District showed that 50.0% of ulcers were identified between the 2nd and 4th day of evaluation⁽⁹⁾.

These findings are probably due to the severity of ICU patients, who are usually more unstable in the first days of hospitalization, requiring measures for clinical stabilization, such as being restricted to bed, connected to devices, and using vasoactive and sedative drugs. There are also other priority measures for sustaining life, like postponing activities such as risk assessment for PU

and some interventions to maintain the integrity of the skin, such as changing positions. However, these should be implemented as soon as the patient's condition is satisfactorily stabilized, allowing an accurate examination of the skin and the use of measures and devices to prevent PU.

Within this scope, the patients who overcome this phase of instability without developing PU, but remain in this complex environment, need to be perceived by the multidisciplinary team, especially nurses and nursing technicians, as a high-risk group for PU. Therefore, we should implement early prophylactic measures, seeking not only the clinical stability and the unit discharge, but also return the patient to the family without iatrogenic complications such as the dreaded pressure ulcers.

The most prevalent medical diagnoses of hospitalization among the patients in study were respiratory dysfunctions, which lead to the difficulty of maintaining the ventilation/perfusion ratio in ideal conditions for proper oxygenation of cells and can even result in the need to engage the patient to devices that assist this ventilation. Corroborating this finding, a study of factors associated with pressure ulcers in ICU patients verified a PU prevalence of 54.5% in patients with disorders of the respiratory system⁽¹³⁾.

Analyzing the characteristics of pressure ulcers installed in the patients in study, there was a predominance in the sacral region, three cases (27.3%), and dorsal region, with two (18.2%). However, most of the injuries, six (54.5%), were developed in different places, of which three were identified in less likely places, as they are not areas of bony prominences such as the nose, inner thigh and plantar region.

Injuries developed in atypical areas were probably due to inappropriate actions while handling patients in bed and by the lack of pressure caused by the devices that critically ill patients usually need, but that can cause iatrogenic events. In this context, we highlight the importance of maintaining daily surveillance, specially

focused on bony prominences and other body regions exposed to the pressure of medical devices such as probes, masks and catheters⁽¹⁵⁾.

Regarding the evolution stage of the injuries developed during the follow-up of patients in the study, most were in category II, seven (63.6%). It is important mentioning the lack of injuries in category III or IV, which probably relates to the care provided in the unit and the attention that management has given to the problem, getting the right products, recommended by the best clinical evidence for prevention and treatment of pressure ulcers.

Analyzing the outcome of ICU patients, we found that most patients who developed PU ended up dying, unlike the group without PU, where most patients were discharged. A research conducted in the ICU of a Hospital in Minas Gerais/MG, Brazil, found that, of the seven patients who developed injuries, six died still in the ICU⁽¹⁶⁾. These results show that these injuries, besides increasing the suffering of patients and institutional costs, raise morbidity and mortality rates. Corroborating the results, a research conducted on the prevention and treatment of PU in an Intensive Care Unit with nurses from a Teaching Hospital of João Pessoa/PB, Brazil, verified that the professionals surveyed consider the adoption of preventive measures and treatment relevant for these injuries, seeking to improve the prognosis and prevent infections that can lead to sepsis and death⁽¹⁷⁾.

CONCLUSION

The results enabled to outline the reality of the service investigated, providing support for care planning and drawing attention to the challenges that we face due to the problems represented by pressure ulcers, since, even with the investments, these are still present in practice and with significant impact.

Given the findings and observations during the investigative process, we suggest, as a strategy to

reduce the PU incidence in ICU, a greater investment in professional training through in-service continuing education, as well as the development and implementation of protocols for prevention and treatment of these injuries, where these responsibilities are more directly related to the nursing staff.

COLLABORATIONS

Silva MLN and Oliveira SHS contributed to the design, data collection, analysis, data interpretation, drafting and final approval of the version to be published. Caminha RTÓ contributed to data collection and analysis, and drafting. Diniz ERS and Neves VSN contributed to data interpretation, drafting and final approval of the version to be published. Oliveira JL contributed to data analysis and interpretation and drafting.

REFERENCES

1. Irion G. Feridas: novas abordagens, manejo clínico e atlas em cores. 2ª ed. Rio de Janeiro: Guanabara Koogan; 2012.
2. National Pressure Ulcer Advisory Panel. Pressure ulcer stages revised by NPUAP. [Internet] 2009 [cited 2012 Jan 03]. Available from: <http://www.npuap.org/pr2.htm>.
3. Shahin ES, Dassen T, Halfens RJ. Pressure ulcer prevalence and incidence in intensive care patients: literature review. *Nurs Crit Care*. 2008; 13(2):71-9.
4. Costa IG. Incidência de úlcera por pressão em hospitais regionais de Mato Grosso, Brasil. *Rev Gaúcha Enferm*. 2010; 31(4):693-700.
5. Soares DAS, Vendramin FS, Duarte LM, Proença PK, Marques MM. Análise da incidência de úlcera de pressão no Hospital Metropolitano de Urgência e Emergência em Ananindeua, PA. *Rev Bras Cir Plást*. 2011; 26(4):578-81.
6. Fernandes NCS, Torres GV, Vieira D. Fatores de risco e condições predisponentes para úlcera de pressão em pacientes de terapia intensiva. *Rev Eletr Enf. [periódico na Internet]* 2008 [citado 2012 out 12];10(3):733-46. Disponível em: http://www.fen.ufg.br/fen_revista/v10/n3/pdf/v10n3a19.pdf
7. Cremasco MF, Wenzel F, Sardinha FM, Zanei SSV, Whitaker IY. Úlcera por pressão: risco e gravidade do paciente e carga de trabalho de enfermagem. *Acta Paul Enferm*. 2009; 22(n. spe):897-902.
8. Fernandes LM, Caliri MHL. Uso da escala de Braden e de Glasgow para identificação do risco para úlceras de pressão em pacientes internados em centro de terapia intensiva. *Rev Latino-am Enfermagem*. 2008; 16(6):973-8.
9. Matos LS, Duarte NLV, Minetto RC. Incidência e prevalência de úlcera por pressão no CTI de um Hospital Público do DF. *Rev Eletr Enf. [periódico na Internet]* 2010 [citado 2012 jan 13];12(4):19-26. Disponível em: <http://www.revistas.ufg.br/index.php/fen/article/viewFile/8481/8495>.
10. Mattia AL, Rocha AM, Barbosa MH, Guimarães MAMC, Borgato MO, Silva SRR, et al. Úlcera por Pressão em UTI: fatores de risco e medidas de prevenção. *Cienc Saúde Coletiva*. 2010; 7(46):296-9.
11. Jimenez I, Moreira GD, Guerra HR. Benefício de la aplicación de la escala de Norton en pacientes graves. Unidad de Cuidados Intensivos. Hospital Militar Docente Dr. Mario Muñoz Monroy. Matanzas. *Rev Méd Electron. [periódico na Internet]* 2010 [citado 2012 nov 12];32(5). Disponível em: <http://www.revmatanzas.sld.cu/revista%20medica/ano%202010/vol5%202010/tema02.htm>
12. Fernandes NCS, Torres GV. Incidência e fatores de risco de úlceras de pressão em pacientes de unidade de terapia intensiva. *Cienc Cuid Saude*. 2008; 7(3):304-10.
13. Gomes FSL, Bastos MAR, Matozinhos FP, Temponi HR, Meléndez GV. Factors associated to pressure ulcers in patients at Adult Intensive Care Units. *Rev Esc Enferm USP*. 2010; 44(4):1065-71.
14. Araújo CRD, Lucena STM, Santos IBC, Soares MJGO. A enfermagem e a utilização da escala de Braden em

úlceras por pressão. Rev Enferm UERJ. 2010; 18(3):359-64.

15. Cuervo FM. Las Úlceras por presión: una problemática prevenible. In: Coletânea: Enfermagem e úlceras por pressão: da reflexão sobre a disciplina às evidências nos cuidados, GRUPO ICE. Angra do Heroísmo [internet] 2008 [citado 2012 Maio 22].

Disponível em:

http://sociedadeferidas.pt/documentos/Enfermagem_e_ulceras_por_Pressao_-Colectanea.pdf

16. Patente MEF, Patente CLF, Araújo APCM, Santana JCB, Dutra BS, Campos ACV. Úlcera por pressão em pacientes internados em unidade de terapia intensiva. Percurso Acadêmico. 2011; 1(1):51-60.

17. Rolim JA, Vasconcelos JMB, Caliri MHL, Santos IBC. Prevention and treatment of pressure ulcers in the daily lives of intensivists nurses. Rev Rene. 2013; 14(1):148-57.