

Pressure Injuries: Clinical and Risk Profile of Patients and Characteristics of Injuries*

ORIGINAL

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Abstract

Objectives: To investigate the clinical profile and the level of risk for pressure injuries in patients with these injuries in the Intensive Care Unit, and describe the characteristics of the identified injuries.

Method: quantitative, exploratory study conducted in Teaching Hospital in João Pessoa/PB, approved by the Institutional Ethics Committee, under protocol number 451/11. The sample consisted of 20 patients, with pressure injuries. To collect data, we used the Braden Scale and a form with clinical data and description of injuries.

Results: 45.0% were at high risk and 30% very high (30.0%) to develop the lesions that occurred predominantly in the sacrococcygeal region (33.3%) and stage II (55.0%).

Conclusions: All patients had clinical profile and risk level compatible with the development of pressure injuries, highlighting the importance of assessing the Braden Scale and other contributing factors for the occurrence of these injuries in the studied unit.

Keywords

Injury Pressure; Intensive Care Unit; Risk Assessment.

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Introduction

The occurrence of pressure injuries (PI) in bedridden patients has, over the years, arousing the interest of health professionals and re-

searchers. In recent decades, there is evidence of a growing increase in the number of publications focusing on the multiple causes of the problem, its prevention and treatment. However, despite advances in knowledge of the causes of PI and recommendations for prevention, the number of patients who develop these injuries, mainly during hospitalization, remains high, with serious consequences for patients and caregivers, and for services health through the important economic burden that cause [1]. Thus, it is justified the concern of researchers on this subject, because it is a problem preventable and unacceptable in most cases [2].

The term pressure injury was established in April 2016 by the National Pressure Ulcer Advisory Panel (NPUAP), replacing the name pressure ulcer, and also has been updated the nomenclature of the qualifying stages. Since then the PI came to be defined as "a localized damage to the skin and/or tissue underlying soft, usually over a bony prominence or related to the use of medical device or other device," which occurs as a result of intense pressure and/or prolonged in combination with shearing [3]. It also became clear that the tolerance of soft tissue to pressure and shear, can be affected by other factors such as microclimate, nutrition, infusion, comorbidities and its condition [3].

In the Intensive Care Unit (ICU) it is stated that the PI may arise in the first week of hospitalization, which shows the need to know the risk factors and the skin condition of critically ill patients in the first twenty-four hours of admission [4] with the aim of taking preventive actions. It is worth noting that even in patients previously with PI, the risk assessment should be carried out continuously in order to prevent the occurrence of injuries elsewhere [5].

A recent study [6] points out that overseas the incidence of PI in critically ill patients has been around 5.8% to 33.3%, requiring, therefore, further investigation about the incidence and prevalence in the Brazilian reality. Despite the lack of national data,

studies in different scenarios of ICUs (Intensive Care Units) in Brazil in recent years, bring contributions, revealing an incidence between 13.95% [7] and 37% [8] and a prevalence of 17.79% [7] and 58% [8]. At the local level, a study conducted in the same reality which the present study was carried out got an incidence of 22.2% [9]. It is clear, therefore, that the prevalence and incidence of PI in Brazilian ICUs remain with high percentages in the different studies.

Currently, the incidence of PI has been identified as a quality indicator (negative) of assistance [6,10], and this indicator turns out to monitor and evaluate the impact of nursing actions in the process of care for hospitalized patients [6] strengthening the consensus that most of PI are preventable by implementing preventive measures [11]. In Brazil, ICU is the reference sector for monitoring the incidence of PI in the hospital [12].

Thus, considering the importance of the topic and the high dependence of nursing care that patients with PI requires, became interested in developing this study in an attempt to draw a clinical and risk profile of patients with these injuries in a ICU of a teaching hospital, in order to support future innovation projects aimed at improving care practice. Knowing the risk profile of patients with PI in enrolled unit will facilitate the targeting of specific actions to ensure the effectiveness of prevention measures in patients with intact skin and those with injuries, since in these cases are essential, and favoring the prevention of further injuries. The presence of PI is an additional risk factor for the appearance of new lesions [3, 11].

It is further, in search of the articles published in the Virtual Health Library, related to the theme; it is evident the absence of published studies with an approach discussed in this research, in the context of the study unit. Thus, the present study aims to contribute with knowledge to support best practices from the following objectives: To research the clinical profile and the level of risk for pressure in-

juries in patients with these injuries in the Intensive Care Unit and describe the features of the identified injuries.

Materials and Methods

This is an exploratory study, prospective, conducted in the ICU of a teaching hospital in João Pessoa-PB. The research universe consisted of all patients admitted to the service during the three-month period (20 September to 20 December 2012), totaling 42 patients. The sample consisted of 20 patients, was obtained by accessibility considering the following inclusion criteria: carrier of PI at the time of ICU admission or develop the injury during the period of data collection, meet the acceptance criteria for participation in research (if conscious) or through formal authorization from the responsible relative, when unconscious. Therefore, all subjects, or their guardians were invited to sign the Term of Informed Consent, pursuant to the National Health Council Resolution 196/96 [13], in force at the time of the study.

Data collection occurred after the project approval by the Ethics and Research Committee of the institution under HULW/CEP No 451/11 protocol. In the collection procedure, all patients admitted to the ICU during the study period were evaluated on admission or within 24 hours after admission, to include those who were already carriers of PI, and those who did not have injuries were followed in tests, every 48 hours, until the time of detection of PI. At the time of identification of the PI, the researcher confirmed with the duty nurse if it was the knowledge of the staff, in order to adopt appropriate measures for treatment, seeking to minimize the evolution of the injury and its possible complications.

For data collection was used a form containing relevant information to the variables selected for the study, which are: 1) demographic variables: sex, race and age; 2) clinical variables: medical diagnosis

on ICU admission, underlying disease, use of medications during hospitalization, BMI (body mass index) and serum hemoglobin; 3) variables related to risk of developing PI: Total score of the Braden Scale (6-23), and the subscores, sensory perception, moisture, activity, mobility, nutrition and friction and shear (graded from 1 to 4, except friction and shear whose range is 1 to 3 [14, 15]) and categories of risk (very high risk - scores equal or lower to 9), high risk - scores from 10 to 12 points, moderate risk - scores from 13 to 14 points, low risk - scores from 15 to 18 points and without risk - scores from 19 to 23 points) [16]; 4) variables related to PI features: anatomical location and classification of the PI on the stage of these injuries (pressure injury stage 1, pressure injury stage 2, pressure injury stage 3, pressure injury stage 4, unclassified pressure injury (UPI) and deep tissue pressure injury (DTPI) [3]. The procedures for obtaining the information of interest for the study included clinical examination of patients and consultation of their medical records.

The analysis of results obtained in the study was performed in a quantitative approach. For this, we used validation technique of double entry in the Microsoft Excel spreadsheet. To detect inconsistencies, the data collection instrument was located and made corrections. After proving the consistency of data consistency, these were taken and analyzed in SPSS (Statistical Package for Social Science) version 16.0, using descriptive statistics with presentation of absolute and percentage frequencies for all variables.

Results

The sample consisted of 20 patients with PI, of which ten were admitted with injuries and ten developed it during the hospital stay. The socio-demographic characteristics of the subjects showed equal distribution between the sexes (50% male and 50% female), 60% non-white, and the majority (60%) were aged over 60 years.

With regard to clinical conditions of the patients, the most evident medical diagnosis on admission was respiratory diseases (35%), followed by gastrointestinal and infectious diseases (20% each one). Among the underlying diseases, was especially heart disease (45%), endocrine, nutritional and metabolic disorders (40%) and neurological disorders (25%).

In the investigation of prescription, there was a higher frequency of analgesics/antipyretics (90%), antibiotics (85%) and diuretics (60%). Regarding to the Body Mass Index (BMI), the highest percentages of patients remained in excess of body weight (40%) and healthy (35%). With respect to hemoglobin, the majority of patients (60%) was in the normal range. Clinical data of the patients are shown in **Table 1**.

Table 1. Distribution of patients with pressure injuries according to clinical data. João Pessoa, 2011.

Clinical Information	Carrier patients with PI (n=20)	
	N	%
Medical diagnosis on admission (principal)		
Respiratory diseases	7	35.0
Gastrointestinal disorders	4	20.0
Infectious diseases	4	20.0
Heart diseases	3	15.0
Neurological disorders	2	10.0
Underlying diseases *		
Heart diseases	9	45.0
Endocrine, nutritional and metabolic disorders	8	40.0
Neurological disorders	5	25.0
No pathology associated	3	15.0
Gastrointestinal disorders	2	10.0
Respiratory diseases	2	10.0
Blood and blood forming organs	1	5.0
Diseases of the urinary tract	1	5.0
Skin diseases	1	5.0

Clinical Information	Carrier patients with PI (n=20)	
	N	%
Drugs in use *		
Analgesics/antipyretics	18	90.0
Antibiotics	17	85.0
Anticoagulants/Platelet	13	65.0
Diuretics	12	60.0
Oral antidiabetic/insulin	9	45.0
Vasoconstrictor	9	45.0
Anxiolytic/antidepressant/neuroleptic	8	40.0
Vitamins	6	30.0
Corticoids	6	30.0
Antihypertensives/Vasodilators	5	25.0
Sedative-hypnotics	4	20.0
Body mass index (BMI)		
Excess weight (25,0-29,9)	8	40.0
Healthy (18,6-24,9)	7	35.0
Underweight (<18,5)	3	15.0
Obesity (>30,0)	2	10.0
Hemoglobin serum (g/dl of blood)		
Normal (men: > 12,0; women: > 10,0)	12	60.0
Moderate reduction (men: 12,0 a 10,0; women: from 10,0 to 8,0)	4	20.0
Severe reduction (men: <10,0; women< 8,0)	4	20.0
*: Some patients had more than one underlying disease, and many utilized several types of drugs.		

The total scores according to the risk category for the development of PI and sub-scores of risk, in accordance to BS (Braden Scale) are arranged in graphs 1 and 2. The total risk score of patients ranged from low risk to very high risk, with higher percentages in high-risk categories (45%) and high risk (30%), as shown in **Figure 1**.

Considering the BS sub-scores shown in **Figure 2**, it is observed that the parameter *sensory perception* the distribution was similar to the items *fully limited* (40%) and *very limited* (30%). Item *humidity* was highlighted to *occasionally wet* (65%); *Activity* showed unanimity in the item *bedridden* (100%); in *Mobility*, *totally immobile* item (70%) predomi-

Figure 1: Total score of risk as the Braden Scale of patients with pressure injuries. João Pessoa, PB, Brazil, in 2011.

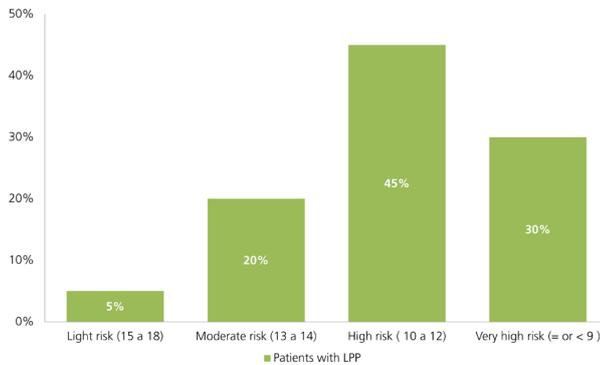
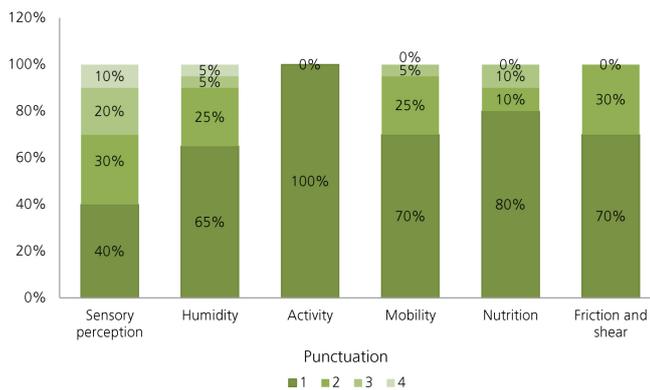


Figure 2: Sub-scores of Risk as the Braden Scale of patients with pressure injuries. João Pessoa, PB, Brazil, in 2011.



nated; in *Nutrition*, the *probably inappropriate* item was present in 80% of cases. Regarding *Friction and shear* parameter, it presented a greater concentration on the *problem* item (70%).

Regarding the characteristics of PI present in the sample, it was considered its location and staging. It was found equal distribution among patients who were admitted to the ICU carrying PI (50%) and those that developed during the hospitalization (50%), standing out in both situations, the sacral region (30.0 % and 33.3% respectively). Stage 2 (55.0%) predominated among patients admitted with PI, and stage 1 (50.0%), among those who developed the PI in the ICU.

Discussion

The ICU patient is considered critical because of their clinical condition that requires more care of the multidisciplinary team and usually presents environmental and psychobiological limitations, such as hemodynamic instability, movement restriction for a long time and use of sedative and analgesic drugs [5]. Under these circumstances, besides being confined to bed, the patient has capacity to feel pain/discomfort compromised due to the change in perception caused by these drugs. This reality constitutes a major risk factor for the emergence of PI, which justifies the fact that 50% of the sample has developed PI in the ICU environment during the period of data collection.

Looking at the socio-demographic data of the sample, it appears that, in relation to gender, there was a similar percentage distribution among holders of PI, corroborating other local study (50%) [9]. Other studies show different results, with a tendency to prioritize male [4-5, 7, 14, 17, 18] or female [6], but the consensus among authors [9, 14, 18] is that despite the different results, there is no correlation between the gender and the emergence of PI.

The color of the skin of patients affected by PI in patients was primarily not white. This variable appears in different studies [5,9,17-19] without deepening the discussion, but the result of research [19] held in Mato Grosso corroborates our study for the non-whites in 77.8% of subjects, while others have differences of 62.5% [9], 65% [5] and 69% [17] for white and 38% for brown [18].

With regard to age, it was observed significant percentage of patients with PI with ages above 60 years, reinforcing the results of different studies [4-5, 18, 20] that reveal the age variable associated with the development of PI. In this sense, the literature shows the advanced age as an important risk factor for the emergence of PI, because of changes in the skin and subcutaneous tissue, due to the aging process [20-21], changes in the skin healing process [18], decreasing the perception of pain and tissue

vascularization [5, 14, 18], favoring the appearance of these injuries.

In contrast, three studies showed the emergence of PI in younger population ranged between 45 and 59 years in 50.0% [9], 71.4% [18] and 66.7% [19], which shows the need for the team to be aware to the set of individual factors that characterize the uniqueness of each patient and should not be taken into consideration only isolated factors to target preventive measures and treatment.

With regard to the clinical conditions of the patients studied, respiratory diseases had higher percentages as medical diagnosis on admission, according to the results of other studies [9, 18] which showed a higher prevalence of these injuries among patients with respiratory system diseases, such as acute pulmonary respiratory failure, pulmonary embolism and pneumonia. These problems refer to the "difficulty of maintaining the relationship ventilation/perfusion in ideal conditions for the proper oxygenation of cells and can also mean the need to engage the patient to devices that help this ventilation" [9], contributing to the emergence of PI.

The underlying diseases were related to heart disease (45%), considered as a risk factor for the emergence of PI for affecting the "perceptual capacity, blood circulation, oxygenation, mobility, level of consciousness, changes on the levels electrolytes and proteins" [21].

The drugs more frequently used by patients in the study were analgesics, antipyretics (90%) and antibiotics (85%). The first two also appear in a recent study [18], with greater use among patients with PI. The major problems associated with the use of medications in elderly patients and the emergence of PI occurs mainly because some medications, such as those that appear in this study, can interfere with wound healing, and may cause negative effects on the skin, making it more vulnerable to injuries [21].

Regarding the level of risk to which patients were exposed while staying at ICU, from the sco-

res obtained with the BS, there was a variation between high risk (45%) and very high (30%), corroborating with a research recent that identified 304 patients at risk for developing PI, of which 268 were at high risk for this problem [7]. Another study showed similar percentage, in which the high-risk was present in 55.5% [8] of the cases. These data reinforce the vulnerability of critical patient treated in the ICU, considering their severity during the hospital stay and the predictive validity that BS provides to professionals, making it possible to diagnose risk situations and assess what are the most appropriate action to be taken before the clinical evidence of the patient [8].

BS provides a elaboration of important characteristics that influence the emergence of PI through its six sub-scores. Thus, in category sensory perception it was evidenced an entirely limited population (40%), it is, a group of individuals unable to perceive pain or discomfort in any part of the body providing, along the long period of hospitalization, the emergence of PI. Data from another study bring a different picture, with 41% of patients with PI without presenting limitations of sensory perception [5].

In the category humidity, the occasionally wet item was highlighted (65%). Consistent with this data, a survey [5] held in Belo Horizonte showed a similar results, with 49% of patients rarely kept moist. Thus, it can be said that in both cases the patients had no predisposing conditions to excessive moisture, or had received proper care hygiene supply by professionals. Some authors emphasize that the "excessive moisture caused by urinary incontinence, anal or even the perspiration, can be avoided when it decreases the change of clothes intervals and increases accuracy in hygiene and especially drying after bathing the patient" [22].

The category *activity* showed that all patients in the study were considered bedridden, corroborating results of another study in ICU [5], and strengthening, also, that these patients have a higher depen-

dence to move into bed, leading to a prolonged restriction to this environment and increasing the risk of developing PI. This finding, coupled with the findings of the *Mobility* category, which proved totally immobile patients, strengthens the greatest degree of dependence on the care team. In this context, the authors [7] reported that the nursing staff must carry out change of patient decubitus (when indicated) every two hours, facilitating greater mobility.

Nutritional deficiencies from a lower supply in food may predispose patients to the formation of PI, to trigger changes in the inflammatory phase and tissue regeneration, as well as increasing the risk of infection and sepsis [5]. Authors [22] also point out that this situation causes a decrease in collagen synthesis and cell adhesion slowing the healing process. Therefore, the result of this study, that showed patients with probably inadequate nutrition (80%), emerges the need for frequent assessments of nutritional status and implementation of appropriate measures in the face of low sub-scores.

Remembering that, in the case of patients considered critical and in intensive care, nutritional support ends up being inadequate because of the limitations of each patient for feed and also by factors related to the clinical condition that may interfere with the absorption of nutrients. Authors agree that the nutritional aspect evaluated by BS is limited as it assesses the intake and not the nutritional status [5]. Therefore, it is considered appropriate to use other complementary nutritional assessment tools, results of biochemical tests of the patient, and the nutritionist intervention.

In *Friction and shear* category, the *problem* item had the highest percentage (70%) corroborating another study [5], in which 57% of patients also had a problem, which shows a greater exposure of the skin to friction. In this sense, some authors recommend the practice of using mobile bed sheet for two people to move or elevate the patient to reduce friction and shear, thereby reducing the risk of developing PI [22], in addition to repositioning

decubitus dorsal with elevating the head at 30° [3].

The location of the PI of the patients studied, both already admitted with PI as those that developed after admission to the ICU, the most evident was the sacral (30.0% and 33.3% respectively), as other studies that achieved the same finding with similar percentages of 33.3% [4], 36% [18] 50% [20] and 60% [8]. It is appropriate to mention that the gluteal region stood out in another study 20% [8], and the anatomical region that had featured in several studies was the heel with 20% [20], 22% [18] and 69.2% [19], which came in second place in this study, with 25%.

Researchers point out that the most likely areas of PI development are those susceptible to uneven distribution of body weight, which have large bony prominences or under heavy pressure, being the most common: sacrum, ischial, trochanter, calcaneus among others [22]. They also claim that this condition favors the emergence of PI in the lower part of the body [19, 22], justifying the findings of this study, as the most affected areas by PI were the most vulnerable to the effects of friction and shear that, coupled with the pressure, were instrumental in the genesis of injury [8].

The PI classification that stood out was the stage 2, the same occurred in recent studies in conducted in Santos-SP with 54.5% of cases [4], in Belo Horizonte with a percentage of 57.0% [18] in the Federal district of study, in which it was identified that 20 out of 32 injuries were in stage 2 [8]. These data highlight the need to invest in preventing injuries and use all available treatment, since much can be done to restore this damaged tissue and prevent aggravation and sequels, as they are the early stages of the PI.

Conclusion

The study showed that all patients had clinical profile and risk level compatible with the development of PI, highlighting the importance of asses-

sing through the Braden Scale other factors that may contribute to the occurrence of injuries. We emphasize the obvious BS contribution to identify patients at risk, as well as the factors that require more attention through its sub-scores, which favors decision-making and addressing nursing interventions in a coherent and individualized way as early as possible.

Despite that scale be standardized in the service, there has been difficulties in applying their results in planning interdisciplinary actions for prevention of PI and even for keeping using them in carriers of the injuries. Based on the foregoing, it is suggested a review of this issue in the ICU studied, by implementing continuing education activities along with the health team, so that the Braden Scale can be used effectively in the professional routine, subsidizing therefore the development of preventive actions with patients. However, it emphasizes the need to assess the problem of PI in the context of the individual needs of each patient and a multidisciplinary perspective, given the multifactorial nature of the problem.

Identified injuries were more evident in the sacral region, demonstrating consistency with other studies in the same reality of ICU and awakening to the need for further research to assess the relationship between the dynamics of mobilization and body repositioning of patients and the occurrence of PI in specific regions of the body.

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