



ORIGINALES

Characterization of pressure lesions in adults with multidrug resistant germs

Caracterização das lesões por pressão em adultos portadores de germes multirresistentes

Caracterización de las úlceras por presión en adultos con gérmenes multirresistentes

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ABSTRACT:

Objective: To describe the characteristics of the pressure lesions in adult patients with multiresistant germs.

Method: This is a cross-sectional study conducted with patients admitted to the inpatient unit for multidrug resistant germs in a public hospital in Brazil. Patients with pressure lesions from stage II were selected. Data collection took place in 2017, in a sample of 110 injuries, in patients, through the Pressure Ulcer State Assessment Instrument (Bates-Jensen Wound Assessment Tool - BWAT).

Results: The average age of the individuals was 45.4 (\pm 21.3) years old and 89.1% had already suffered pressure lesions, such as those that occurred at home or in other health institutions. The mean BWAT value was 35.5 \pm 8.9 points and there was a weak positive correlation ($r = 0.228$ $p = 0.017$) with lesion size, moderate positive correlation with lesion stage ($r = 0.540$ $p < 0.001$), and with the result of the Braden scale ($r = 0.44$ $p = 0.651$).

Conclusion: The results indicated the illness of young patients. Patients with multiresistant germs suffered pressure lesions with greater involvement of structures, which suggests the need for home support.

Keywords: Pressure Lesion; Drug Resistance, Multiple Drugs; Nursing Cares.

RESUMO:

Objetivo: Descrever as características das lesões por pressão em pacientes adultos portadores de germes multirresistentes.

Método: Trata-se de um estudo transversal, realizado com pacientes hospitalizados na unidade de internação para portadores de germes multirresistentes de um hospital público do sul do Brasil. Foram selecionados pacientes portadores de lesão por pressão a partir de estágio II. A coleta de dados ocorreu em 2017, em uma amostra de 110 lesões, através do Instrumento de Avaliação do estado da

Úlcera por Pressão (Bates-Jensen Wound Assessment Tool – BWAT. Os dados foram analisados através de estatística descritiva e analítica.

Resultados: A idade média dos indivíduos foi 45,4 (\pm 21,3) anos e 89,1% já internaram com lesão por pressão, as quais ocorreram no domicílio ou em outras instituições de saúde. O valor médio da BWAT foi de $35,5 \pm 8,9$ pontos e houve correlação positiva fraca ($r=0,228$ $p=0,017$) com o tamanho da lesão, correlação positiva moderada com o estágio da lesão ($r= 0,540$ $p<0,001$) e com o resultado da escala de Braden ($r= 0,44$ $p=0,651$).

Conclusão: Os resultados apontam o adoecimento de pacientes jovens. Pacientes portadores de germes multirresistentes apresentaram lesões por pressão com maior acometimento de estruturas, o que sugere necessidade de aporte domiciliar.

Palabras-chave: Lesão Por Pressão; Resistência a Múltiplos Medicamentos; Cuidados de Enfermagem

RESUMEN:

Objetivo: Describir las características de las lesiones por presión en pacientes adultos con gérmenes multirresistentes.

Método: Este es un estudio transversal realizado con pacientes hospitalizados en la unidad de pacientes hospitalizados por gérmenes resistentes a múltiples fármacos de un hospital público en el sur de Brasil. Se seleccionaron pacientes con lesión por presión del estadio II. Los datos se recopilaron en 2017 de una muestra de 110 lesiones en 36 pacientes utilizando la Herramienta de evaluación de heridas Bates-Jensen (BWAT). Los datos se analizaron mediante estadísticas descriptivas y analíticas.

Resultados: La edad promedio de los individuos fue de 45.4 (\pm 21.3) años y el 89.1% había sido hospitalizado con una lesión por presión, que ocurrió en el hogar o en otras instituciones de salud. El valor medio de BWAT fue de 35.5 ± 8.9 puntos y hubo una correlación positiva débil ($r = 0.228$ $p = 0.017$) con el tamaño de la lesión, correlación positiva moderada con el estadio de la lesión ($r = 0.540$ $p < 0.001$), y con el resultado de la escala de Braden ($r = 0.44$ $p = 0.651$).

Conclusión: Los resultados muestran la enfermedad de pacientes jóvenes. Los pacientes con gérmenes multirresistentes presentaron lesiones por presión con una mayor participación de las estructuras, lo que sugiere la necesidad de apoyo en el hogar.

Palabras clave: Úlcera por Presión; Resistencia a Múltiplos Medicamentos; Atención de Enfermería

INTRODUCTION

One of the great challenges for health services is to seek excellence in quality of care and to be a reference in the service offered. In a hospital context, Pressure Lesions (PL) are adverse events that have consequences for the patient, family, institution and the health system, despite being an avoidable incident, making recovery difficult, increasing risk of infection and hospitalization time. It is considered internationally as an adverse event and is an indicator nursing care quality, and its presence contributes to increased morbidity and mortality. ⁽¹⁻³⁾

The PL is characterized by damage to the skin and/or underlying structures, usually bony prominences, caused by isolated pressure or combined with shear and/or friction, classified according to the degree of damage observed to the tissues^(4,5). According to the National Report of Health Care Related Incidents, from January 2014 to July 2017, 23,722 (17.6%) pressure lesions were reported in Brazil⁽⁶⁾. Studies in the country have identified that its incidence can vary from 23.1% to 59.5%, mainly in intensive care unit patients^(1,7). It is estimated that in the United States approximately 2.5 million patients develop PL each year. The prevalence in Canada is around 26% and in Turkey between 5.4% and 17.5%⁽⁸⁾.

With multifactorial etiology, the appearance of a pressure lesion dependent on external factors, such as pressure on bone areas, risk of shear, friction and humidity; and inner

factors of the patient, such as age, condition of nutrition and hydration, level of consciousness, mobility, smoking and comorbidity. It is known that nursing is one of the main responsible for the prevention and treatment of pressure lesions and, for that, must have knowledge about the subject and about the health conditions of the patient to prescribe care individually^(4,8).

The financial impact of PL on the patient, family and health organizations is another significant factor, having a close relationship with the commitment degree of the structures involved. An evaluation carried out in Brazil identified that the cost of treatment is proportional to the size of the affected area and the stage at which the lesion is found. Thus, stage 2 PL had an average treatment cost of R\$ 67.69 to 172.32, stage 3 between R\$ 29.02 and R\$ 96.38, stage 4 between R\$ 20.04 and R\$225,34; and the non-classifiable ones cost between R\$ 16.41 and R\$ 260.18⁽⁹⁾. The lesion by pressure can still be classified as uninfected or infected, in which case it is often associated with osteomyelitis, which can occur in 17 to 32% of LPs and increasing treatment costs⁽¹⁰⁾.

Currently, the lesion by pressure is the most reported adverse event by the Patient Safety Centers in Brazil's health services, corresponding to 18.9%⁽³⁾. However, with the increase of chronic bedridden patients, the incidence of PL at home has raised concerns. A study carried out in Indonesian hospitals found that 44% of patients with evaluated patients had lesions prior to hospital admission. In Brazil, an investigation estimated that 21% of patients in home care developed PL^(11,12).

The chronicity of diseases and the investment in various treatment possibilities triggered another worrying phenomenon, the increased incidence of patients with multidrug-resistant germs (MRG). The experience in a public hospital in the south of Brazil demonstrated that it is a clientele that depends partially or totally for the fulfillment of basic needs, becoming an individual more vulnerable to the involvement by PL. It was found that 61.7% of hospitalized MRG patients had a semi-intensive level of complexity (partially dependent) and 27% intensive (completely dependent) for care, with no difference for seasonality⁽¹³⁾, signaling a clientele that needs caregivers

In this context, it was found in a specific sector for the care of patients with MRG that many patients already arrived at the hospital with a previously developed pressure lesion. There was a gap in relation to studies evaluating pressure lesions in patients with MRG. Thus, the objective of the research was to characterize pressure lesions in adult patients with multidrug-resistant germs admitted to a teaching hospital in southern Brazil and to identify possible correlations with individual variables. Identifying the characteristics of the PL of the patients assisted allows the specific training of the nursing team in the treatment of lesions, as well as greater investment in training the family for prevention and home care. It also assists in the acquisition of inputs and in the adequate dimensioning of nursing professionals for the treatment of patients with multiple lesions, promoting the qualification of care.

MATERIAL AND METHOD

Cross-sectional study conducted with patients hospitalized in an inpatient unit of a public and university hospital in southern Brazil. It is a sector with 34 beds being available to receive clinical and surgical patients, from different medical specialties.

Multidisciplinary care for patients with multidrug-resistant germs (MRG) is a characteristic of the unit.

The research's population consisted of MRG patients with PL Caused at the institution or arising from the community. In this sector, individuals from 13 years old are interned. Patients from stage II, with any evolution time and in any anatomical region, who remained in the sector for at least 24 hours, were included. PL patients who were discharged before collection were excluded. Readmissions were treated as a new patient and a new lesion, due to the possibility of worsening in other sectors or at home.

The sample size was calculated using the WinPEPI program (Programs for Epidemiologists for Windows) version 11.43 and based on the strength of the correlation estimated in Callegari-Jacques⁽¹⁴⁾. Considering a significance level of 5%, power of 85%, an estimate of a minimum correlation coefficient of 0.3 between the variables, a minimum total of 97 lesions was obtained. The selection was made randomly according to the hospitalization order. Data were collected by nurses previously trained, through the weekly application of the research protocol throughout the hospitalization, from January to April 2017, within 48 hours after hospitalization.

The protocol consisted of an instrument for characterizing the patient and the lesion, and the Instrument for Assessing the State of Ulcer by Pressure (Bates-Jensen Wound Assessment Tool - BWAT), which contains 13 items that assess size, depth, edges, detachment, type and amount of necrotic tissue, type and amount of exudate, edema and hardening of peripheral tissue, skin color around the wound, granulation tissue and epithelialization. The measurement scale is of the Likert type, with five points, where 1 indicates the best condition of the wound and 5, the worst condition. The total score is obtained with the sum of all items and can vary from 13 to 65 points, with the highest scores indicating the worst wound conditions. The translation and adaptation to Brazilian culture took place in 2015⁽¹⁵⁾.

To determine the patient's risk for the development of the ulcer, the Braden scale was used, which is composed of six criteria for evaluation, and its subscales: 1- sensorial perception; 2- humidity; 3 – activity; 4- mobility; 5- nutrition; 6- friction and shearing, whose subscale has a score ranging from 1 to 4, with the exception of the friction and shear domain (score from 1 to 3), with values between 6 and 23. Values <11 are considered to be patients at high risk of developing PL; between 12 and 14, moderate risk; between 15 and 16, low risk; and between 17 and 23, without risk⁽¹⁶⁾.

Data were collected through information from patients' electronic medical records and through direct inspection on the pressure lesions, grouped in *Microsoft Excel for Windows*® spreadsheets and analyzed with the help of the statistic package "*Statistical Package for the Social Sciences*®" (SPSS), version 20. The variables were analyzed individually using descriptive statistics and Pearson's correlation test was used to analyze the continuous variables. *p* values were considered statistically significant when less than 0.05.

The research was carried out after approval by the Research Ethics Committee of the institution involved, under number 57253616.7.0000.5327, and met the national and international standards of ethics in research involving human beings, according to Resolution 466/12 of the National Health Council.

RESULTS

36 patients took part in the study, totaling 110 lesions, with the quantitative per patient varying between from one and twelve lesions. The maximum time of participation in the research was 8 weeks, and the average stay in hospital was 12 days. All patients were chronically ill, with a diagnosis of secondary to their pathology as their reason for hospitalization and developed a lesion prior to hospitalization in the sector. The sociodemographic data of the evaluated patients are described in Table 1:

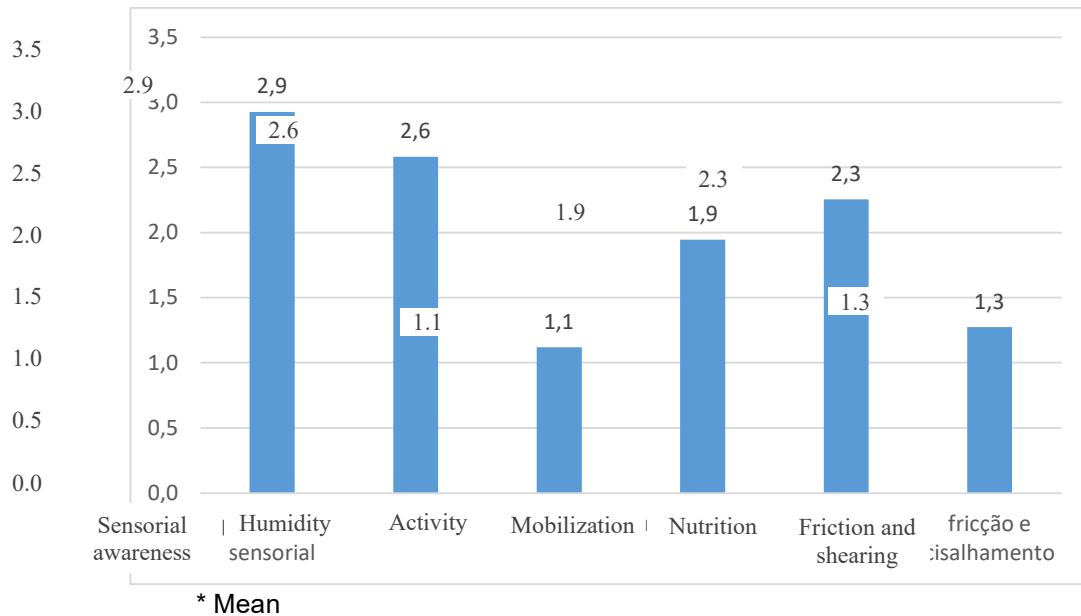
Table 1- Description of the sociodemographic data of patients with multidrug-resistant germs with pressure lesion. Porto Alegre, RS, Brazil, 2017. (n=36)

Sociodemographic Data	Results
Age*	45.4 to 21.3 years old
Age group**	
Adolescent (12-18 years old)	3 (8.3%)
Adult (19-59 years old)	24 (66.7%)
Elderly (over 60 years old)	9 (25%)
Male gender**	23 (63.9%)
Nutritional status	
Eutrophic	17 (47.2%)
Malnourished;	17 (47.2%)
Overweight	2 (5.6%)
Number of pressure lesions**	
One lesion	13 (36.1%)
More than one lesion	23 (63.8%)
Origin**	
Emergency sector	13 (36.1%)
Other inpatient units	10 (27.8%)
Intensive treatment center	8 (22.2%)
Other hospitals	5 (13.9%)

* Mean and standard deviation ** n(%)

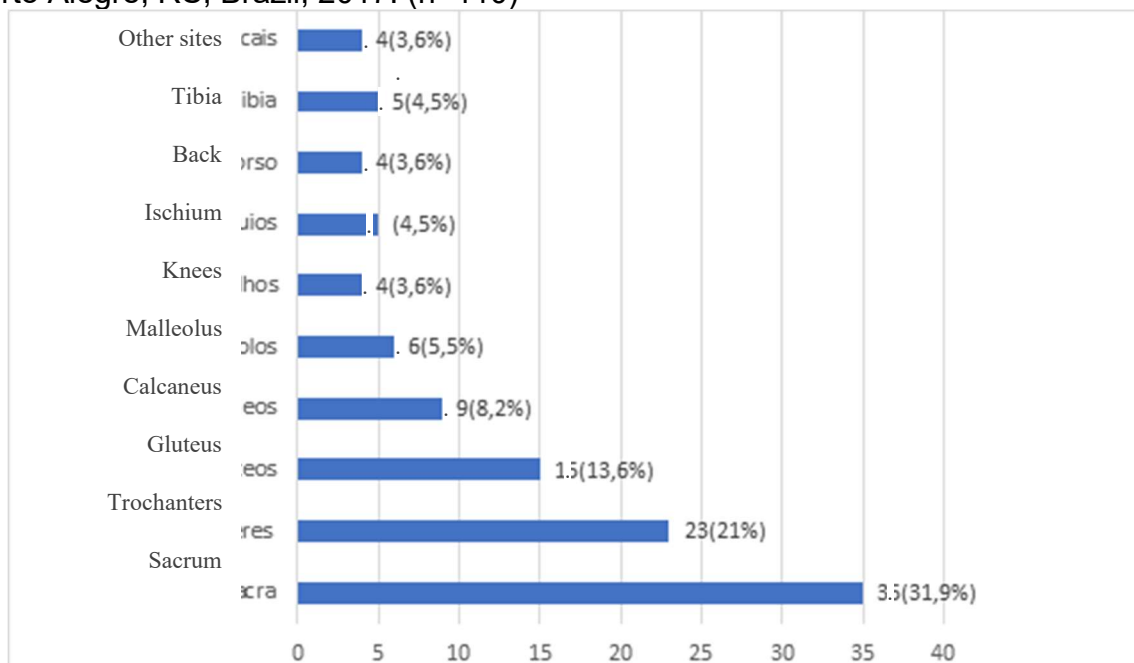
The average Braden was 12.1 ± 1.92 points, with 10 (27.8%) patients at moderate risk, 23 (66.7%) at high risk and 2 (5.5%) at very high risk. Infected pressure lesion was the reason for the hospitalization of 8 (22.8%) individuals. The characteristics of the patients according to the classification of the Braden scale are shown in Graph 1:

Graph 1: Characterization of patients with multidrug-resistant germs and with pressure lesion according to the Braden scale indicators.* Porto Alegre, RS, Brazil, 2017. (n=36)



In relation to lesions, 12 (10.9%) were acquired at the time of data collection, and the region most affected was the sacral region, with 35 (31.9%) lesions and trochanters, with 23 (21%), according to data in Graph 2:

Graph 2: Distribution of the location of pressure lesions in hospitalized patients. Porto Alegre, RS, Brazil, 2017. (n=110)



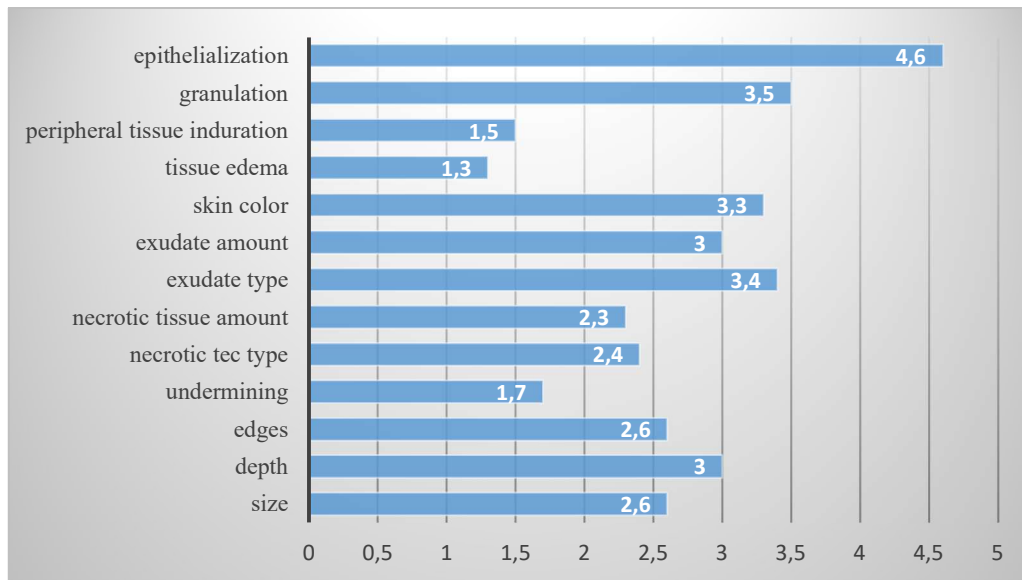
Source: Research data, 2017.

The evaluation of the lesions showed that 43 (39.1%) were Stage II, 29 (26.4%) Stage III, 24 (21.8%) Stage IV and 14 (12.7%) with non-defined stage.

The average lesion size was $36 \pm 38,9$ cm², with median of 14cm², varying between 0.25 and 651 cm².

The mean value of the BWAT was 35.5 ± 8.9 points, with an interval between 19 and 62 points and presented a Cronbach's alpha of 0.8 in the studied population. The average of the items evaluated in the instrument is shown in Graph 3.

Graph 3: Average of the indicators of the Pressure Ulcer Status Assessment Instrument (BWAT). Porto Alegre, RS, Brazil, 2017. (n=110)



Source: Research data, 2017.

As for the characteristics evaluated by the BWAT, 72 (65.5%) the lesions did not show detachment, 90 (81.2%) showed less than 25% of the wound covered by epithelialization, 89 (89.9%) did not have edema around the lesion, 73 (66.6%) did not have hardening of the peripheral tissue and 58 (52.7%) had defined edges, with visible contour and leveled with the wound base. Other characteristics are shown in Table 2.

Table 2- Most relevant characteristics of pressure lesions in hospitalized patients. Porto Alegre, RS, Brazil, 2017. (n=110)

Item	Characteristics	N (%)
Depth	Damage to the epidermis and/or dermis	45(40.9)
	Damage or necrosis of subcutaneous tissue	35(31.8)
	Total loss of skin thickness with extensive destruction, tissue necrosis or damage to muscle, bone or support structures	19(17.3)
Type of necrotic tissue	Absent	41(37.3)
	Non-viable white gray tissue and/or yellow non-adherent sphacelate	15(13.6)
	Slightly adhered yellow sphacelate	28(25.5)

		Black shank	26(23.7)
Amount of necrotic tissue		Absent	42(38,2)
		<25% of the wound bed covered	29(26.4)
		25 a 50% of the wound covered	14(12,7)
		>50% of the wound covered	25(22,8)
Type of exudate		Absent	22(20)
		Bloody or serous	51(46,4)
		Purulent, thin or thick, between opaque brown and yellow, with or without odor	37(33,6)
Amount of exudate		Absent, dry wound	19(17.3)
		Shank, moist wound, but with no evidence of exudate	20(18.2)
		Small	23(20.9)
		Moderate to large	45(43,6)
Skin color around the lesion		Pink or normal for the ethnic group	15(13.6)
		Bright red and/or whitish to the touch	20(18,2)
		White or pale or hypopigmented gray	23(20,9)
		Dark red or purple and/or unbleachable	20(18,2)
		Black or hyperpigmented	32(29,1)
Granulation Tissue		75 a 100% of the wound filled	24(21.8)
		< 75% e mais de 25% of the wound filled	29(26.4)
		< 25% of the wound	28(25.5)
		Absence of granulation tissue	28(25.5)

Source: Research data, 2017.

It was found that the total BWAT result did not correlate with age ($r = -0.095$ $p = 0.321$) and with nutritional status ($r = -0.036$ $p = 0.708$), there was a weak positive correlation ($r = 0.228$ $p = 0.017$) with the size of the lesion, moderate positive correlation with the stage of the lesion ($r = 0.540$ $p < 0.001$) and with the result of the Braden scale ($r = 0.44$ $p = 0.651$).

There was also no correlation between age and lesion size ($r = -0.102$ $p = 0.289$) or between lesion size and nutritional status ($r = 0.066$ $p = 0.495$).

DISCUSSION

Many studies identify the elderly as the population at greatest risk for involvement by PL, different from the result of this assessment⁽⁷⁾. This data may be related to the increase in violence, a factor that has been changing the profile of patients being cared in hospital institutions.

Currently, the external causes are the third leading cause of death in the Brazilian population. Firearms stand out as major generators of morbidity and mortality, with significant involvement of adolescents and young adults⁽¹⁷⁾.

There is an increase in hospitalized young people, affected by spinal cord lesion resulting from gunshot lesion, diagnosed with osteomyelitis and infected pressure lesion.

A literature review found that the average prevalence of PL in patients with spinal cord trauma in developing countries was 35.2%, ranging from 26.7 to 46.2%. Spending on the unique system with individuals who have been victims of violence has been gradually increasing, also burdening families, who are unable to afford the costs and care⁽¹⁹⁾.

There is apparently no definition in the literature about the correlation between sex and pressure lesion.

However, studies that showed a higher prevalence of male patients reinforce the cultural issue in relation to the prevention and maintenance of health, causing shorter average lifespan and greater severity of chronic diseases⁽²⁰⁾. Data demonstrate a greater male exposure to violence and exposure to risky behavior, also for cultural reasons⁽²¹⁾ These facts may justify the greater number of male patients.

The value of the Braden Scale score for patients with MRG is similar to that found in critically ill patients and admitted to Intensive Care Centers.

However, when evaluating the scale indicators, it is noteworthy that the average obtained in the item sensory perception shows patients with mild neurological limitation, different from what is found in bedridden adult populations, where there is a greater relationship between neurological damage and risk⁽²⁰⁾. There are also occasionally wet, bedridden individuals with very limited mobility and a problem with shear and friction, such mobility and activity limitations are directly related to the PL development⁽²²⁾.

The sacral region was the one with the highest prevalence of PL, in accordance with other studies⁽²³⁾. It was found that the population with MRG has lesions with greater impairment of structures, when compared to other hospitalized adults, since only 43 (39.1%) were in Stage II⁽²⁴⁾. It is noteworthy that few studies were found that addressed the lesion size assessment.

In California, a survey of elderly people in a long-term care home showed lesions ranging from 0.02 cm² to 174 cm², with an average of 6.4 +14.9 cm².

It identified that 88% of the lesions did not have necrotic tissue, whereas the result found in the unit for MRG was 69% of PL with necrosis⁽²⁵⁾. This data, together with the fact that 98 lesions are prior to hospitalization, demonstrate weakness in health care services, family difficulty in caring and deficient home care.

Nutritional condition can be a risk factor for the appearance of PL as well as for its healing⁽²⁶⁾, however, patients with MRG showed a low correlation among nutrition status, lesion size and BWAT outcome.

This fact may also be due to the patient's profile, as they are young patients, with more adequate nutritional status, but bedridden, with difficulty in self-care and little family support.

In the critically ill patients, malnutrition stands out as an intrinsic risk factor most associated with lesions, and is related to decreased tissue tolerance to the pressure⁽²⁰⁾.

On the other hand, there was a correlation of the BWAT result with the lesion stage and with the Braden value, indicating that the higher the BWAT value the worse the lesion stage and the greater the risk for new pressure lesions.

Similar result was found in the study with California seniors⁽²⁵⁾. Another important factor to be considered is that the results found demonstrated consistency in the application of the instruments.

CONCLUSION

This study made it possible to characterize pressure lesions in adult patients with multidrug-resistant germs admitted to a teaching hospital in southern Brazil and to identify possible correlations with individual variables.

The result brought a worrying panorama, dealing with the illness of productive people, victims of urban violence.

It also revealed the configuration of a new patient profile for nursing care in Brazil.

Patients with MRG have pressure lesions with greater impairment of structures, increasing therapy-related time and cost.

It is noteworthy that as important as the adequate follow-up and treatment of PL is its prevention, through care and educational measures that promote the patient's quality of life.

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REFERENCES

1. Borghardt AT, Prado TN do, Bicudo SDS, Castro DS de, Bringuento ME de O. Pressure ulcers in critically ill patients: incidence and associated factors. Rev

- Bras Enferm [Internet]. 2016 Jun [cited 2019 Oct 4];69(3):460–7. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0034-71672016000300460&lng=pt&tlng=pt
2. Vasconcelos J de MB, Caliri MHL. Nursing actions before and after a protocol for preventing pressure injury in intensive care. *Esc Anna Nery - Rev Enferm* [Internet]. 2017 [cited 2019 Oct 6];21(1). Available from: <http://www.gnresearch.org/doi/10.5935/1414-8145.20170001>
 3. Furini ACA, Nunes AA, Dallora MEL do V. Notificação de eventos adversos: caracterização dos eventos ocorridos em um complexo hospitalar. *Rev Gauch Enferm* [Internet]. 2019 [cited 2019 Oct 4];40(spe):e20180317. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1983-14472019000200419&tlng=pt
 4. Moraes JT, Borges EL, Lisboa CR, Cordeiro DCO, Rosa EG, Rocha NA. Conceito e classificação de lesão por pressão: atualização do National Pressure Ulcer Advisory Panel. *Rev Enferm do Centro-Oeste Min* [Internet]. 2016 Jun 29 [cited 2019 Oct 6];6(2). Available from: <http://www.seer.ufsj.edu.br/index.php/recom/article/view/1423>
 5. Palagi S, Severo IM, Menegon DB, Lucena A de F. Laser therapy in pressure ulcers: Evaluation by the Pressure Ulcer Scale for Healing and Nursing Outcomes Classification. *Rev da Esc Enferm* [Internet]. 2015 Oct [cited 2019 Oct 6];49(5):826–33. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0080-62342015000500826&lng=en&tlng=en
 6. Brasil. Agência Nacional de Vigilância Sanitária. Boletim Segurança do Paciente e Qualidade em Serviços de Saúde nº 15: Incidentes Relacionados à Assistência à Saúde - 2016 [Internet]. Brasília; 2017 [cited 2018 Aug 12]. 20 p. Available from: https://www20.anvisa.gov.br/segurancadopaciente/index.php/publicacoes/item/boletim-seguranca-do-paciente-e-qualidade-em-servicos-de-saude-n-15-incidentes-relacionados-a-assistencia-a-saude-2016?category_id=28.
 7. Souza NR de, Freire D de A, Souza MA de O, Melo JT da S, Santos L de V dos, Bushatsky M. Fatores predisponentes para o desenvolvimento da lesão por pressão em pacientes idosos: uma revisão integrativa. *Rev Estima* [Internet]. 2017 Dec 25 [cited 2019 Aug 6];15(4):229–39. Available from: <https://www.revistaestima.com.br/index.php/estima/article/view/442/pdf>
 8. Gul A, Andsoy II, Ozkaya B, Zeydan A. A descriptive, cross-sectional survey of Turkish nurses' knowledge of pressure ulcer risk, prevention, and staging. *Ostomy Wound Manag* [Internet]. 2017 [cited 2019 Aug 6];63(6):40–6. Available from: www.o-wm.com FEATURE
 9. Andrade CCD, de Almeida CF dos SC, Pereira WE, Alemão MM, Brandão CMR, Borges EL. Costs of topical treatment of pressure ulcer patients. *Rev da Esc Enferm* [Internet]. 2016 Apr [cited 2019 Oct 6];50(2):292–8. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0080-62342016000200295&lng=en&tlng=en
 10. Dinh A, Bouchand F, Davido B, Duran C, Denys P, Lortat-Jacob A, et al. Management of established pressure ulcer infections in spinal cord injury patients [Internet]. Vol. 49, *Medecine et Maladies Infectieuses*. Elsevier Masson; 2019 [cited 2019 Oct 6]. p. 9–16. Available from: <https://www.sciencedirect.com/science/article/pii/S0399077X1730728X?via%3Dihub>
 11. Amir Y, Lohrmann C, Halfens RJ, Schols JM. Pressure ulcers in four Indonesian hospitals: prevalence, patient characteristics, ulcer characteristics, prevention

- and treatment. *Int Wound J* [Internet]. 2017 Feb 2 [cited 2019 Oct 6];14(1):184–93. Available from: <http://doi.wiley.com/10.1111/iwj.12580>
12. Moro JV, Caliri MHL, Moro JV, Caliri MHL. Pressure ulcer after hospital discharge and home care. *Esc Anna Nery - Rev Enferm* [Internet]. 2016 [cited 2019 Oct 6];20(3). Available from: <http://www.gnresearch.org/doi/10.5935/1414-8145.20160058>
 13. Macedo ABT, Souza SBC de, Funcke LB, Magalhães AMM de, Riboldi C de O. Systematization of an instrument for patient classification in a teaching hospital. *REME Rev Min Enferm*. 2018;22.
 14. CALLEGARI-JACQUES SM. *Bioestatística: princípios e aplicações*. Porto Alegre: Editora Artmed. 255p. Artmed Editora; 2009.
 15. Alves DF dos S, Almeida AO de, Silva JLG, Morais FI, Dantas SRPE, Alexandre NMC. Translation And Adaptation Of The Bates-Jensen Wound Assessment Tool For The Brazilian Culture. *Texto Context - Enferm* [Internet]. 2015 [cited 2019 Nov 10];24(3):826–33. Available from: http://www.scielo.br/scielo.php?pid=S0104-07072015000300826&script=sci_arttext
 16. Paranhos W, Santos V. Avaliação de risco para úlceras de pressão por meio da escala de Braden, na língua portuguesa. *Rev esc enferm USP*. 1999;33(1):191–206.
 17. Sousa, A.S.B., Silva, S.C., Cavalcante MFA. Mortalidade por causas externas em adultos jovens em Teresina-PI no período de 2001-2011. *Rev Interdiscip* [Internet]. 2016 [cited 2019 Nov 12];9(1):57–65. Available from: <https://revistainterdisciplinar.uninovafapi.edu.br/index.php/revinter/article/view/594>
 18. Zakrasek EC, Creasey G, Crew JD. Pressure ulcers in people with spinal cord injury in developing nations. Vol. 53, *Spinal Cord*. Nature Publishing Group; 2015. p. 7–13.
 19. Ribeiro AP, de Souza ER, de Sousa CAM. Lesões provocadas por armas de fogo atendidas em serviços de urgência e emergência Brasileiros. *Cienc e Saude Coletiva*. 2017 Sep 1;22(9):2851–60.
 20. Sousa RG de, Oliveira TL de, Lima LR de, Stival MM. Fatores associados a úlcera por pressão (UPP) em pacientes críticos: Revisão Integrativa da Literatura - doi: 10.5102/ucs.v14i1.3602. *Univ Ciências da Saúde*. 2016 Jul 13;14(1).
 21. Souto RMCV, Barufaldi LA, Nico LS, de Freitas MG. Perfil epidemiológico do atendimento por violência nos serviços públicos de urgência e emergência em capitais brasileiras, Viva 2014. *Cienc e Saude Coletiva*. 2017 Sep 1;22(9):2811–23.
 22. National Pressure Ulcer Advisory Panel EPUAP and PPPI, Alliance. *Prevenção e Tratamento de Úlceras por Pressão: Guia de Consulta Rápida* [Internet]. Haesler E, editor. Cambridge Media. Austrália; 2014 [cited 2019 Nov 24]. Available from: www.nzwcs.org.nz
 23. Sales MCM, Borges EL, Donoso MTV. Risco e prevalência de úlceras por pressão em uma unidade de internação de um hospital universitário de Belo Horizonte. *Rev Min Enferm* [Internet]. 2010 [cited 2019 Nov 25];14(4):566–75. Available from: <http://reme.org.br/artigo/detalhes/152>
 24. Teixeira AKS, Nascimento T da S, Sousa ITL de, Sampaio LRL, Pinheiro ARM. Incidência de lesões por pressão em Unidade de Terapia Intensiva em hospital com acreditação. *Rev Estima*. 2017 Sep;15(2):152–60.
 25. Bates-Jensen BM, McCreath HE, Harputlu D, Patlan A. Reliability of the Bates-Jensen wound assessment tool for pressure injury assessment: The pressure

- ulcer detection study. *Wound Repair Regen* [Internet]. 2019 Jul 18 [cited 2019 Nov 25];27(4):386–95. Available from: <https://onlinelibrary.wiley.com/doi/abs/10.1111/wrr.12714>
26. Oliveira KDL de, Haack A, Fortes RC. Nutritional therapy in the treatment of pressure injuries: a systematic review. *Rev Bras Geriatr e Gerontol* [Internet]. 2017 [cited 2019 Nov 29];20(4):562–70. Available from: <http://dx.doi.org/10.1590/1981-22562017020.160195>

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