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Original article

Incidencia de Lesiones por Presión en pacientes adultos mayores hospitalizados, durante el periodo 2018-2021

Incidence of pressure injuries in hospitalized older adult patients, during the 2018-2021 period

Ma. Rosy Fabián Victoriano David Adrián Escamilla Juárez Alejandra Morales Rubio

Resumen

Introducción: en los pacientes adultos mayores (PAM) de 65 años, el riesgo de desarrollo de lesiones por presión (LPP) aumenta 6% por cada año de edad. Este grupo presenta además condiciones como malnutrición, inmovilidad, pérdida de la independencia, hipoalbuminemia, anemia y linfopenia, asociados a LPP graves, que interfieren significativamente en la calidad de vida y son un factor de riesgo añadido en la mortalidad.

Objetivo: describir la incidencia de LPP en pacientes adultos mayores hospitalizados.

Metodología: estudio observacional, descriptivo, longitudinal y retrolectivo; población conformada por 3600 registros clínicos de PAM hospitalizados durante el periodo 2018-2021, muestreo secuencial.

Resultados: la media de edad fue de 74.91 años (DE 9.11); 19.9% de los pacientes desarrollaron LPP, la incidencia fue de 16.43/1000 días de hospitalización; 59.1% desarrollaron 1 LPP y 28.9% 2 LPP; el estadio más frecuente fue el II (43.4%), seguido del estadio no identificable (25.5%); el promedio de días para el desarrollo de LPP fue de 6.08 (DE 5.31). La región más afectada fue el sacro (19.22%), seguida del talón (17.13%). El servicio en el que más LPP se presentaron fue urgencias (44%). La media de puntuación Braden fue de 7.87.

Conclusiones: si bien la incidencia de LPP es alta, se observó que la media de edad del paciente y el promedio de días para su desarrollo es mayor a lo reportado previamente. Los resultados servirán para implementar estrategias de prevención dirigidas a la población adulta mayor, ya que presentan factores de riesgo que los hacen propensos al desarrollo de LPP.

Palabras clave: lesión por presión, adulto mayor, incidencia.

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Correpondence: Ma. Rosy Fabián Victoriano
Email: marofavi@gmail.com
Hospital general Dr. Manuel Gea González

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Abstract

Introduction: In older adult patients (OAP) aged 65 years, the risk of developing pressure injuries (PI) increases by 6% for each year of age. This group also presents conditions such as malnutrition, immobility, loss of independence, hypoalbuminemia, anemia, and lymphopenia, associated with severe PI, which significantly interfere with quality of life and are an added risk factor for mortality.

Objective: to describe the incidence of PI in hospitalized older adult patients.

Methodology: observational, descriptive, longitudinal, and retrolective study; population conformed by 3600 clinical records of hospitalized OAP during 2018-2021, sequential sampling.

Results: mean age was 74.91 years (SD 9.11); 19.9% of patients developed PI, the incidence was 16.43/1000 days of hospitalization; 59.1% developed 1 PI and 28.9% 2 PI; the most frequent stage was stage II (43.4%), followed by unidentifiable stage (25.5%); mean number of days for PI development was 6.08 (SD 5.31). The most affected region was the sacrum (19.22%), followed by the heel (17.13%). The department with the most PI was the emergency department (44%). The mean Braden score was 7.87.

Conclusions: Although the incidence of PI is high, it was observed that the mean patient age and the average number of days for its development are higher than previously reported. The results will help to implement prevention strategies aimed at the elderly population since they present risk factors that make them prone to the development of LPP.

Keywords: pressure injury, older adult, incidence.

Introduction

Pressure injuries (PI) are a serious problem in the hospital environment; they occur mainly in services where patients remain hospitalized for more than 3 days and, depending on the stage of PI that develops, can prolong their hospital stay for up to 14 days.[1,2]

Patients with PI may see their quality of life deteriorate due to various factors, for example, pain, treatment procedures, depression, and infections, such as osteomyelitis. It is estimated that 17 to 32% of patients with PI develop complications that can put their physical integrity and even their lives at risk since mortality in these cases can increase up to three times. The development of PI in the hospital is associated with an increased risk of death; it is estimated that up to 59.5% of patients die within the first year after hospital discharge.[3-6]

In addition, PI have a considerable financial impact on patients, as they generate increased medical treatment costs for their families and healthcare organizations. The treatment costs of PI include the costs of care, materials, procedures, and the personnel needed to manage them. In the United States, it is estimated that the

annual cost of PI management could exceed 26.8 billion dollars, while in Mexico the monthly cost of such management is 715 million pesos. In this regard, it should be noted that the cost of treatment also depends on the degree of commitment of the structures involved.[5,2,7]

The World Health Organization (WHO) considers the incidence of PI as an indicator of quality in health care services and points out that worldwide they have an average frequency of 8.91% in the hospital setting, mainly affecting critically ill patients. Other studies report a prevalence ranging between 5 and 12%. In Latin America and Mexico, prevalence is estimated at 12.92%. In the USA, it is estimated that 1 to 3 million people develop PI each year and 60,000 die from the complications of these ulcers.[8,1,3,6]

On the other hand, PI are considered an adverse event related to nursing care, since they constitute *"harm caused by health care and not by the underlying pathology"*. In this sense, the adverse event results from interventions performed or not performed on patients, and is related to the quality and safety of inpatient care. However, although hospitalized patients can develop PI, it is estimated that 44% of cases have some PI developed before admission.[9,5]

In 2016, the National Pressure Ulcer Advisory Panel (NPUAP) conducted a consensus to update the concept of *"pressure ulcer"*, modifying it to *"pressure injury"*. Thus, PI was defined as localized damage to the skin and underlying soft tissue, usually over a bony prominence, related to a medical or other device. The lesion may present as intact skin or an open ulcer and may be painful. It occurs due to intense and/or prolonged pressure or a combination of pressure with shear. It should be considered that soft tissue tolerance for pressure and shear may be affected by microclimate, nutrition, perfusion, comorbid conditions, and soft tissue status.[10]

The NPUAP classifies PI into different stages: stage I: erythema that does not blanch on digit pressure; stage II: partial-thickness ulcer; stage III: total loss of skin thickness; stage IV: total loss of tissue thickness, which may involve bony structures, ligaments and/or joints; unclassifiable because covered with necrotic tissue and/or slough (unknown depth); suspected deep tissue injury; and medical device-related PI.[11]

The risk factors for the development of PI are: decreased mobility, malnutrition, low body mass index, decreased physical health -which includes factors such as oxygenation and perfusion-, advanced age, body temperature, friction, skin moisture, pain, drugs used, use of certain types of medical devices, impaired cognition, sensory perception, and comorbidities. To these are added the care risk factors, such as staffing deficiencies, the care team's knowledge of ulcer assessment and prevention, the quality of interventions, and clinical practice guidelines.[4,8]

Individuals of any age and with any health condition can be affected by a PI, but it is more common among the elderly and seriously ill people with various comorbidities. In this regard, a previous study that analyzed a total sample of 3904 patients with PI, of which 66% were adults over 65 years of age, is relevant.[12,13]

The elderly are considered the most vulnerable group due to certain factors, including the characteristics of the skin,

which undergoes various changes due to the aging process and environmental factors that affect hydration, sebaceous secretion, sweat gland function, and permeability; frailty associated with comorbidities, such as neurological and mental status changes; nutritional status; mobility; activity; and urinary and anal incontinence. Furthermore, there are also specific risk factors that relate to the patient's age, general condition, and number of comorbidities, e.g., impaired function in multiple systems, immune senescence, persistent exposure to pressure and skin shear, and subcutaneous fat atrophy.[14]

It is worth noting that the presence of severe PI is associated with this age group since adults over 60 years of age have a 3.13 times higher risk of presenting a PI. In turn, hypoalbuminemia increases approximately 6 times the possibility of having a severe PI, the presence of anemia increases the risk 4 times, and lymphopenia (OR: 3.68; 95%CI: 1.5-9) increases the probability of the presence of severe PI by 3.68 times.[15]

There are several scales to determine a patient's risk of developing PI. One of the most widely used for its sensitivity and specificity is the Braden-Bergstrom scale, composed of 6 subscales, which are: sensory perception, humidity, activity, mobility, nutrition, friction, and shear. This scale is a useful tool in decision-making related to preventive measures to be adopted according to the risk for each patient, which is classified as low, medium, and high risk.[16,15,17]

The most frequent locations of PI are in the lower extremities of the body. Several studies agree that they are mainly located in the sacral region and heels, as well as in the trochanteric area. Vela Anaya states in his study that the most frequent stages were I and II, which represented 73% of the PI examined. The units or services with the highest incidence are the Intensive Care Unit (ICU), Internal Medicine, and Trauma/Orthopedics.[18,14,7,9]

PI are a persistent problem in hospital units and a concern for the nursing area involved in the care of patients who present them since this care demands up to 50% more than the time commonly used.[19,20] Therefore, the objective of this research was to describe the incidence of pressure injuries in older adult patients hospitalized at Dr. Manuel Gea González General Hospital from 2018 to 2021.

Material and methods

Observational, descriptive, longitudinal, and retrolective study. As the universe, all clinical records from the database of patients hospitalized and captured by the Skin Care and Pressure Injury Prevention Clinic in the period from January 2018 to December 2021 were considered. Subsequently, the population was integrated according to the clinical records of older adult patients hospitalized and captured by the said clinic in the aforementioned period. No sample calculation was performed since we worked with the total number of records found, which was 3720 records of older adults; the type of sampling was sequential. Clinical records of adult patients aged 60 years or older who remained hospitalized for more than 24 hours were included, and records with incomplete data were excluded, leaving a total of 3600 records. The variables included were: development of PI during hospitalization,

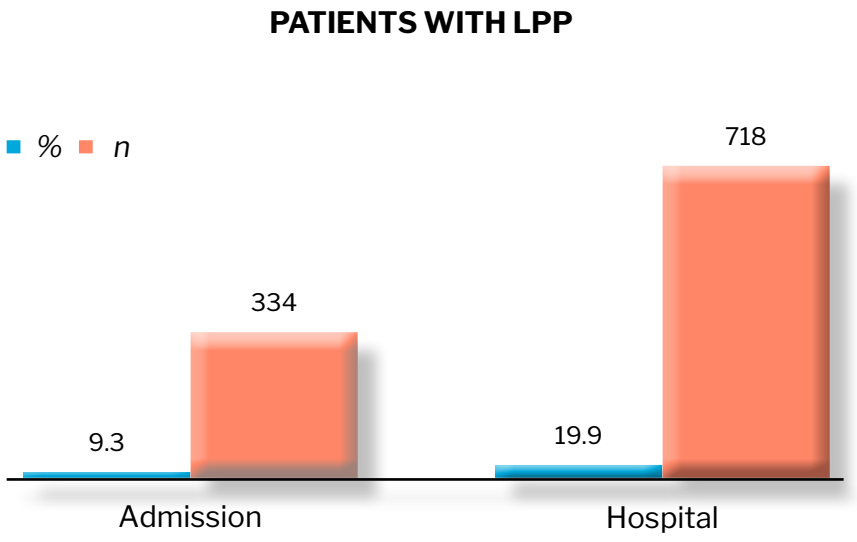
day of lesion development, Braden score on admission and at the time of lesion detection, location, stage, number of PI, days of hospital stay, admission department, and department where the PI was detected, the reason for discharge and use of alternating pressure cushion; the presence of PI on hospital admission, number of lesions, location and stage of the lesions were also considered. The occurrence of the first PI documented in the database, as well as its location, was considered an incident case. Descriptive statistics and the SPSS statistical program were used for data analysis. The protocol was submitted to the Research Committee and the Research Ethics Committee of the institution, who approved the protocol and issued the report with registration number 42-28-2022. The protocol complied with the stipulations of the Regulations of the General Health Law on Health Research.

Results

The mean age of the patients was 74.91 years (SD 9.11), with a predominance of the female sex (52.7%). At the time of hospital admission, 9.3% of the patients had one or more PI, while 19.9% of the patients developed them during their hospital stay (*Graph* 1). The total of patient observation time was 43,675 days. The incidence rate of PI in older adults was 16.43 per 1000 days of hospitalization.

Concerning the stage of the PI patients had at the time of hospital admission, stage II was the most frequent (41.1%), followed by *"deep tissue damage"* (19.4%) and, finally, stage VI or unidentifiable (18.1%). The main services in which the clinic captured older adults at moderate and/or high risk for the development of PI were Emergency, Shock, and Internal Medicine.

Graph 1. Number and percentages of patients with PI according to their development before admission or during hospitalization.



Source: Own elaboration based on clinical records of hospitalized patients.

The average number of days of hospitalization of patients was 21.34. The total number of PI developed by the patients was 1144; of this total, 59.1% of the cases developed a PI. The most frequent stage was stage II (43.4%), followed by stage VI or unidentifiable (25.5%). The average number of days for the development of PI in patients was 6.08. During the study period, the departments with the highest rate of PI were the Emergency Department, Internal Medicine and the Covid ICU. PI were present in different body regions, the most frequent area being the sacrum (19.22%). Likewise, PI were found in rare regions such as the face (cheekbones, nasal bridge, chin), abdomen, knees, and toes, the latter developed during the COVID-19 pandemic. Of the total number of patients in follow-up, 16.2% had an alternating pressure mattress placed during their hospital stay, of which 60.9% developed PI. According to the data of the total study population, the most frequent diagnoses were related to the following systems: respiratory (21.6%), hemodynamic (13.9%), neurological (9%) and metabolic (7.9%). The most frequent reason for discharge was discharge to home (*Table 1*).

Concerning the risk presented by the patients at the time of hospital admission, the mean Braden score was 10.86, which decreased considerably when PI was detected, with a mean of 7.87 (*Table 2*).

Table 1. Characteristics of patients with PI

Characteristics	*n*	%
Age		
60-70	1236	34.3
71-80	1464	40.7
81-90	714	19.8
91-100	177	4.9
101	9	0.2
Sex		
Woman	1898	52.7
Man	1700	47.3
Admission Service		
Plastic surgery	23	.6
Shock	1064	29.6
General Surgery	213	5.9
Hospitalization 4th floor	108	3.0
Internal Medicine	264	7.3
AICS	95	2.6
AICS Covid	106	3.0
Emergency observation	1727	48.0

Origin of PI		
Home	334	9.3
Hospital	718	19.9
Number of PI at admission		
1	81	24.3
2	212	63.47
3	19	5.7
4	22	5.6
PI detection service		
General Surgery	52	7.2
Hospitalization 4th floor	27	3.7
Internal Medicine	164	22.8
AICS	70	9.7
AICS COVID	89	12.3
Emergency observation	316	44
Patients with alternating pressure cushion		
Yes	582	16.2
No	3018	83.8
Reason for hospital discharge		
Discharge to home	2599	72.2
Death	940	26.1
Transfer to another hospital unit or nursing home	46	1.3
Voluntary discharge	15	.4

Source: Own elaboration based on clinical records of hospitalized patients.

Table 2. Additional data on patients with PI

	Media	*IC 95%*
Days of hospital stay	21.34	2.84-45.52
PI Development Days	6.08	5.68-6.48
Braden score at entry	10.86	10.86-11.27
Braden score during detection	7.87	7.63-8.10

Source: Own elaboration based on clinical records of hospitalized patients.

Discussion

PI are considered an adverse event related to nursing care since they represent *"harm caused by health care and not by the underlying pathology"*. In this sense, the adverse event is a result of interventions performed or not performed on patients and is related to the quality and safety of inpatient care.[5] Zhang describes in his study that in the case of adults over 65 years of age, the risk of developing a PI increases by 6% for each year of age.[12]

In this study, the female sex predominated (52.7%), a percentage that coincides with those reported by other authors, such as Machain *et al.*,[18] Tosta de Souza *et al.*[22] and Palese *et al.*,[21] who reported 56, 62.8 and 89.5%, respectively. Regarding age, the group with the highest incidence was 71-80 years, results consistent with Machain *et al.*[18] (75-85) and Palese *et al.*[21] (76.3-88). Approximately 10% of the patients were admitted to the hospital unit with one or more PI, a figure significantly lower than the results published by Morales Ojeda *et al.* (46.8)[16] and Tosta de Souza *et al.* (28.7%).[22] Almost half of the patients enrolled in this study were admitted to the hospital unit through the emergency department (48.0%), a percentage that contrasts with that reported by Palese *et al.*[21] in their study (94.7%).

The most interesting finding that can be extracted from this work was that the incidence rate of PI in hospitalized older adults during the study period (16.43 /1000 days of hospitalization) is lower than that reported by Tosta de Souza et al. (39.4%)[22] in people of the same age group. In contrast, Palese *et al.*[21] report a lower incidence (8.5/100 days of hospitalization) in adult patients older than 65 years. The discrepancies between these findings may be due to the smaller sample size (1464 patients), as well as differences in the study period and patient follow-up.

It is encouraging to compare the results regarding the average number of days in which patients acquired a PI and the risk score obtained through the Braden scale. In this study, PI in patients developed, on average, after 6.08 days from hospital admission (95% CI 5.68-6.48). For their part, Palese *et al.*[21] reported an average of 3.3 days after admission (95% CI 2.2-4.4), a situation that reflects that patients were injured in half the time as in our study. Regarding the risk for the development of PI, high risk, 7.87 (95% CI7.63 - 8.10), predominated at the time of PI detection, while in the study by Palese *et al.*[21], the risk for the development of PI was in the high and moderate limits, 12.1 (95% CI 10.1 - 14.0). However, in the older adult patients captured by the PI Skin Care and Prevention Clinic, the mean score at admission positioned them at high risk, 10.86 (95% CI10.86 - 11.27), which increased as PI screening was performed.

Although it is true that in the study more than half (59.1%) of the patients developed a single PI and 40.9% presented 2 or more lesions, these figures contrast with those reported by Morales Ojeda *et al.*,[16] because in their population approximately three quarters (76.1%) presented a single PI and about a quarter (21.1%) presented two or more lesions. Regarding the stage and location of the PI, the most common was stage II (43.3%), and the most frequent locations were found in the lower and posterior body segment (50.67%; sacrum, heel, and buttocks), findings that are similar

to those of most authors reporting incidence of PI in older adults (Morales *et al.*,[16] Palese *et al.*,[21] Tosta de Souza *et al.*,[22] Machain *et al.*[18]). It is worth mentioning that during the COVID-19 pandemic, in our population we documented the appearance of PI in the upper and anterior body segment, specifically on the face, cheekbones, nasal bridge, and abdomen - frequent locations in patients placed in the prone position as part of treatment in support of mechanical ventilation; however, it was not documented whether these lesions were related to the medical devices or were solely a consequence of the position.

The predominant reason for discharge was discharge to home (72.2%), as in the study by Morales et al (88.7%).16 However, there is a discrepancy in the number of patients who died, since in our population the percentage was higher.

Conclusions

Although the incidence of PI in older adults is indeed high, it is noteworthy that the average number of days for its development is higher than that reported by other authors. It should also be noted that almost half of the patients were admitted to the hospital unit through the emergency department, with the largest number of patients being injured in the emergency department. It is also relevant to note that a quarter of the patients died during the hospitalization period.

Some of the limitations of the study are that it was not determined whether age, gender, comorbidities, the use of medical devices, and the presence of PI at the time of hospital admission were factors associated with the development of PI. Nor was it possible to establish whether there was an association between the diagnosis of COVID-19, and the development, stage, and amount of PI, with patient death.

The results obtained will serve to implement prevention strategies especially aimed at the elderly population, considering that, as described in the literature, they present specific risk factors that make them more vulnerable to the development of PI.

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Declaration of conflict of interest

The authors of this article declare that they have no conflicts of interest.

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