TEXTO & CONTEXTO enfermagem

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PREVALENCE OF FRICTION INJURY AND ASSOCIATED FACTORS IN ELDERLY IN INTENSIVE THERAPY

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ABSTRACT

Objective: to analyze the prevalence of friction injuries and associated factors in the elderly admitted to the Intensive Care Unit.

Method: a cross-sectional analytical study, developed in an Intensive Care Unit of a Teaching hospital, with a sample of 101 elderly. Data collection was conducted from November 2017 to May 2018, through interviews, consulting medical records and physical examination. For analysis, descriptive and inferential statistics were performed. Strength of associations between variables measured by odds ratio and 95% confidence intervals. Statistical significance level was set at 5% for all analyzes.

Results: the sample studied had a mean age of 71.39 years, mostly male, married and without schooling, with more than one comorbidity, dependent, with dry and scaly skin and bruising on the extremities. The prevalence of friction injury was 28.7%, with an average of 1.93 injuries per elderly. There was a statistically significant association between the occurrence of friction injury with age, comorbidities, dry and scaly skin.

Conclusion: the prevalence of friction injury was high and associated with age, comorbidities, dry and scaly skin, and mean duration of corticosteroid use.

DESCRIPTORS: Wounds and injuries. Friction. Elderly. Aging of the skin. Nursing.

PREVALÊNCIA DE LESÕES POR FRICÇÃO E FATORES ASSOCIADOS EM IDOSOS EM TERAPIA INTENSIVA

RESUMO

Objetivo: analisar a prevalência de lesões por fricção e fatores associados em idosos internados em Unidade de Terapia Intensiva.

Método: estudo transversal e analítico, desenvolvido em Unidade de Terapia Intensiva de Hospital Escola, com amostra de 101 idosos. Coleta de dados realizada de novembro de 2017 a maio de 2018, por meio de entrevista, consulta ao prontuário e exame físico. Para análise, realizou-se estatística descritiva e inferencial. Força das associações entre as variáveis aferida pelo *odds-ratio* e intervalos de confiança de 95%. Nível de significância estatística estabelecido de 5% para todas as análises.

Resultados: a amostra estudada apresentava média de idade de 71,39 anos, maioria do sexo masculino, casados e sem escolaridade, com mais de uma comorbidade, dependentes, com pele seca e descamativa e com hematomas nas extremidades. A prevalência de lesão por fricção foi de 28,7%, média de 1,93 lesões por idoso. Verificou-se associação estatisticamente significativa da ocorrência de lesão por fricção com idade, comorbidades, pele seca e descamativa.

Conclusão: a prevalência de lesão por fricção foi elevada e associada à idade, comorbidades, pele seca e descamativa e média do tempo do uso de corticoide.

DESCRITORES: Ferimentos e lesões. Fricção. Idoso. Envelhecimento da pele. Enfermagem

PREVALENCIA DE LESIONES POR FRICCIÓN Y FACTORES ASOCIADOS EN PERSONAS MAYORES EN TERAPIA INTENSIVA

RESUMEN

Objetivo: analizar la prevalencia de lesiones por fricción y los factores asociados en los ancianos ingresados en la Unidad de Terapia Intensiva.

Método: estudio transversal y analítico, desarrollado en una Unidad de terapia intensiva de un hospital universitario, con una muestra de 101 ancianos. La recolección de datos se realizó de noviembre de 2017 a mayo de 2018, mediante entrevistas, consulta de registros médicos y examen físico. Para el análisis, se realizaron estadísticas descriptivas e inferenciales. Fuerza de las asociaciones entre variables medidas por odds ratio e intervalos de confianza del 95%. Nivel de significación estadística establecido en 5% para todos los análisis.

Resultados: la muestra estudiada tenía una edad media de 71.39 años, en su mayoría hombres, casados y sin educación, con más de una comorbilidad, dependiente, con piel seca y con descamación y hematomas en las extremidades. La prevalencia de lesiones por fricción fue del 28,7%, un promedio de 1,93 lesiones por ancianos. Hubo una asociación estadísticamente significativa entre la aparición de lesiones por fricción con la edad, comorbilidades, piel seca y descamación.

Conclusión: la prevalencia de lesiones por fricción fue alta y se asoció con la edad, las comorbilidades, la piel seca y con descamación, y la media del uso de corticoides.

DESCRIPTORES: Lesiones y heridas. Fricción. Ancianos. Envejecimiento de la piel. Enfermería.

INTRODUCTION

Friction Injuries (FI) or skin tears are wounds caused by trauma, either by friction, bruising or shearing of the skin, which may lead to the appearance of partial thickness wounds, separation of the epidermis and dermis, or total separation between both underlying skin layers.[1]

These injuries affect the more extremes of age, but especially the elderly, mainly due to the weaknesses of the body, caused by aging, such as the thinning of skin layers. moisture, elasticity, resistance, inflammatory response, collagen production and decreased pain perception and tactile sensitivity weaknesses that increase after the age of 75.[2]

According to a prevalence study, FI are more frequent than burns and pressure injuries, they do not cause serious potentials, however these injuries cause pain and can become chronic and infective, thus affecting the quality of life of the elderly person.[3]

Life expectancy in Brazil has increased in recent decades which has led to a greater number of elderly people who often need care through hospitalizations, which causes the problem of FI in the elderly population to be worrying. This reality has stimulated several studies on this type of wound, with the intention of systematizing care.

One systematic literature review found an injury prevalence ranging from 3.3% to 22%, associated mainly with advanced age and dependence to perform basic activities of daily living.[3]

In Piauí, Brazil, there are no figures available for FI in hospitalized patients or in intensive care units (ICU), therefore a research question appears, with a view to quantifying the magnitude of this complication in the hospital environment, especially in ICUs, since there is a lack of knowledge in the local and national literature on this theme.

Thus, it is hoped that the present investigation can contribute to the knowledge of the epidemiology of this injury in the studied service, strengthening the knowledge on the subject, and equipping nursing professionals for prevention and control actions, which will improve the care provided to the elderly patient population.

Based on these initial considerations, this study aimed to analyze the prevalence of friction injuries and associated factors in the elderly admitted to the intensive care unit.

METHOD

A cross-sectional analytical study, developed in the ICU of a teaching hospital, located in Teresina, Piauí, Brazil.

The source population were elderly in the ICU. The convenience sample consisted of 101 elderly patients admitted during the data collection period who met the inclusion criteria: 60 years of age and over and admitted to the ICU, regardless of length of stay. Cases of readmission to the unit were excluded.

The following were used for data collection: sociodemographic and clinical data form; Katz scale; and, STAR Classification System - Friction Injury. The sociodemographic variables were: date of hospitalization, hospital stay, diagnosis, age, gender, education, marital status, retirement, monthly family income, weight, height, body mass index (BMI), nutritional status, comorbidities, chemotherapy, other treatments, smoking, continuous medication use, anticoagulant use, corticosteroid use, type and number of catheters, drains and tubes, use of adhesive dressings and location, current skin conditions (bruising, bruising on the extremities, senile purpura, skin dryness and scaling, edema), history of previous FI, previous history of falls, mobility and gait (before ICU stay), visual acuity, Katz (situation before ICU stay) and presence of friction injury. If the elderly presented any FI, information about the injuries presented (amount, location, time of injury evolution, infection, skin flap and classification) was collected.

In order to assess functional independence for the Basic Activities of Daily Living (ABVD), the Katz Scale was used which was, adapted and validated for use in Brazil.[4]

The lesions were classified by the STAR Classification System - Friction Injury, which includes five categories: category 1a (skin flap may be realigned to normal anatomical position and skin or flap color is not pale, opaque or darkened); category 1b (skin flap may be realigned to normal anatomical position and skin or flap coloration is pale, opaque or darkened); category 2a (skin flap of lesion cannot be realigned to normal anatomical position and skin or flap color is not pale, opaque or darkened); category 2b (skin flap cannot be realigned to normal anatomical position and skin or flap color is pale, opaque or darkened); category 3 (skin flap is completely absent).[5]

Data collection was performed from November 2017 to May 2018. The elderly who met the inclusion criteria were evaluated as to the condition of answering the interview, if they did not present because of the clinical condition or artifacts/devices, the interview was performed with the patient´s guardian.

The interview was conducted to collect sociodemographic and clinical data, and was scheduled according to the convenience of the elderly or guardian and the routine of the unit. The interview was complemented with information obtained through consultation of medical records (data on clinical conditions and treatment). During the interview, the Katz Scale was applied and the result recorded on the form. Afterwards, a physical examination of the elderly's skin was performed, in a cephalocaudal sense, with attention given to skin conditions, catheters and drains inserted into the skin, adhesive dressings used and the presence of FI and characteristics. If the patient had any FI, then the STAR Rating System was applied only once.

To assess nutritional status and calculate Body Mass Index (BMI), weight and height were obtained by consulting the nutritional assessment form of the institution present in the medical records. BMI was calculated using the BMI = Weight / Height^2 formula and classified according to the World Health Organization (WHO) recommendation: <18.4 underweight, 18.5-24.9 normal weight, 25-30 overweight and >30 obese.[6]

Exploratory and inferential statistical analysis was performed using the Statistical Package for Social Science (SPSS), version 20.0. Quantitative variables were analyzed and presented using descriptive statistics, such as measures of central tendency and dispersion, and qualitative variables, by proportion.

First, the Kolmogorov-Smirnov test was applied to assess normality. Nonparametric distribution of data was verified. The strength of associations between variables was measured by odds ratio and 95% confidence intervals. For the comparison of means, the Mann-Whitney test was performed. The level of statistical significance was established as 5% for the analyzes.

Participants signed the Informed Consent Form. In addition, it is highlighted that the ethical precepts of Resolution 466/2012 of the National Health Council were met.

RESULTS

A total of 101 elderly people participated in the study, whose sociodemographic information can be seen in Table 1. It is found that 53 (53.5%) were male, with a mean age of 71.39 years, and the majority (86.1%). aged 60 to 79 years, 68 (67.3%) married, 54 (53.5%) without schooling, 31 (30.7%) with family income of up to one minimum wage.

Table 1 – Sample characterization variables of elderly patients treated at an intensive care unit of a teaching hospital. Teresina, PI, Brazil, 2018. (n = 101)

Variables	Minimum	Maximum	Medium	n(%)
Age (years)	60	102	71,39	
60-79				87(86.1)
≥80				14(13.9)
Sex				
Male				54(53.5)
Female				47(46.5)
Marital status				
Married				68(67.3)
Widow				18(17.8)
Single				7(6.9)
Stable union				4(4.0)
Divorced				4(4.0)
Schooling				
Without				54(53.5)
With				47(46.5)
Retirement				
Yes				92(91.1)
No				9(8.9)
Family Income (minimum salary)*				
≤1				31(30.7)
>1				70(69.3)

*Minimum salary = 954,00 reals

Regarding the clinical profile, it was observed that 54 (53.5%) of the participants were undergoing surgical treatment, with an average length of stay of 4.19 days. Regarding nutritional status, elderly with normal weight (65.3%) predominated, followed by obese (14.9%). It was also observed that 64 (63.4%) had comorbidities, including hypertension in 92 (91.1%) of the cases and diabetes in 37 (36.6%). Thus, the majority (68.3%) used continuous medication, 45 (44.6%) using anticoagulant and 34 (33.7%) corticosteroids. Regarding skin conditions, it is noteworthy that 55 (54.5%) presented bruising on the extremities, 38 (37.6%) had senile purpura and 76 (75.2%) had dry and scaly skin. Most used drains (73.3%) and adhesive dressings (77.2%). Although 82 (81.2%) of the elderly presented normal gait and 60 (59.4%) preserved vision, 22 (21.8%) were dependent.

Regarding the prevalence of FI, it was found that among the 101 elderly participants, 29 had friction injuries, resulting in a prevalence of 28.7% (95% CI 28.49-28.90), with an average of 1.93 friction injuries per elderly, with a total of 56 friction injuries.

Table 2 shows the description of the characteristics of the presented injuries. The predominant location was in the limbs, and 46.5% in the lower limbs, without infection (98.2%), without flap in 29 (39.2%) of cases and viable in 22 (39, 2%), for this reason category 3 was the most predominant, in 52.1% of the injuries.

Table 2 – Characterization of the lesions analyzed. Teresina, PI, Brazil, 2018. (n=101)

Variables	Minimum	Maximum	Average	n(%)
Amount of Friction Injuries per Elderly(n=29)	1	6	1,93	
1–4				27(93.1)
≥5				2(6.9)
Localization(n=56)				
Lower limbs				26(46.5)
Upper limbs				19(33.9)
Abdomen				7(12.5)
Posterior thorax				3(5.3)
Sacrum				1(1.7)
Infection (n=56)				
No				55(98.2)
Yes				1(1.8)
Skin flap (n=56)				
Absent				29(52.1)
Viable				22(39.2)
Hematoma				2(3.5)
Ischemia				2(3.5)
Necrosis				1(1.7)
Classification (n=56)				
1a				9(16.0)
1b				8(14.2)
2a				2(3.5)
2b				8(14.2)
3				29(52.1)

Table 3 presents data on the association of sociodemographic and clinical variables with the prevalence of FI. A statistically significant association with the occurrence of FI was found for age (p=0.006), comorbidities (p=0.028) and dry and scaly skin (p=0.023). Elderly aged 60 to 79 years, with comorbidities and dry and scaly skin presented, respectively, 5.02; 2.89 and 2.07 times more likely to develop FI.

Table 3 – Association of sociodemographic and clinical variables with the occurrence of friction injuries. Teresina, PI, Brazil, 2018. (n = 101)

Variables	Occurrence of friction injuries		p-value	OR	CI95%
	No n(%)	Yes n(%)			
Sex			0.502*	0.908	0.382-2.159
Male	38(70.4)	16(29.6)			
Female	34(72.3)	13(27.7)			
Age (years)			0.006*	5.029	1.484-17.041
60-79	66(93.0)	21(72.4)			
≥80	5(7.0)	8(27.6)			
Marital situation			0.256*	0.620	0.221-1.741
With	50(69.4)	22(28.6)			
Without	22(30.6)	6(21.4)			
Schooling			0.502*	0.908	0.382-2.159
Without	38(52.8)	16(55.2)			
With	34(47.2)	13(44.8)			
Income (minimum salary in real)			0.255*	1.571	0.589-4.194
≥1	24(33.3)	7(24.1)			
>1	48(66.7)	22(75.9)			
Retirement			0.207†	3.500	0.418-29.327
No	8(11.1)	1(3.4)			
Yes	64(88.9)	28(96.6)			
Diagnosis			0.093*	2.009	0.821-4.913
Clinical	37(51.4)	10(34.5)			
Surgical	35(48.6)	19(65.5)			
Comorbidities			0.028*	2.898	1.053-7.977
Yes	41(56.9)	23(79.3)			
No	31(43.1)	6(20.7)			
Chemotherapy			0.080†	-	-
No	72(71.3)	27(93.1)			
Yes	0(0)	2(6.9)			
Continuous use medication			0.100*	2.167	0.782-6.003
No	26(36.1)	6(20.7)			
Yes	46(63.9)	23(79.3)			
Use of Anticoagulants			0.378*	0.789	0.330-1.887
No	38(52.8)	17(58.6)			
Yes	34(47.2)	12(41.4)			
Use of Corticoids			0.079*	2.113	0.863-5.171
No	52(72.2)	16(55.2)			
Yes	20(27.8)	13(44.8)			
Use of Drains or catheters			0.162*	1.976	0.665-5.875
No	21(29.2)	5(17.2)			
Yes	51(70.8)	24(82.8)			

Variables	Occurrence of friction injuries		p-value	OR	CI95%
	No n(%)	**Yes n(%)**			
Use of tubes			0.609†	1.083	0.266-4.406
No	8(11.1)	3(10.3)			
Yes	64(88.9)	26(89.7)			
Use of adhesive dressings			0.487*	1.185	0.415-3.387
No	17(23.6)	6(20.7)			
Sim	55(76.4)	23(79.3)			
Contusion			0.553†	0.607	0.065-5.675
No	68(94.4)	28(96.6)			
Yes	4(5.6)	1(3.4)			
Bruising on the extremities			0.451*	1.164	0.490-2.767
No	35(48.6)	13(44.8)			
Yes	37(51.4)	16(55.2)			
Senile Purpura			0.074*	2.121	0.876-5.136
No	50(69.4)	15(51.7)			
Yes	22(30.6)	14(48.3)			
Dry and scaly skin			0.023*	2.072	1.151-3.733
Yes	60(83.3)	18(62.1)			
No	12(16.7)	11(37.9)			
Edema in extremities			0.529*	1.071	0.447-2.567
No	31(43.1)	12(41.4)			
Yes	41(56.9)	17(58.6)			
KATZ			0.547*	0.913	0.317-2.626
Independent	56(77.8)	23(79.3)			
Dependent	16(22.2)	6(20.7)			
Total	72(100)	29(100)			

*Chi-square test; † Fisher's exact test

Table 4 shows the data comparing the means of sociodemographic and clinical variables with the occurrence of FI. There was a statistically significant difference only in the average time of corticosteroid use (p = 0.013), when compared to elderly with and without FI, and those with FI had a shorter average time of corticoid use.

Table 4 – Comparison of means of sociodemographic and clinical variables with the occurrence of friction injuries. Teresina, PI, Brazil, 2018. (n = 101)

Variables	Occurrence of friction injuries		p-value*
	No($\bar{x}$) (n=72)	Yes($\bar{x}$) (n=29)	
Age (years)	70.68	73.17	0.346
Family income (real)	1807.34	2061.34	0.514
Length of stay(days)	4.22	4.10	0.560
Body mass index	23.38	23.36	0.144
Length of time using Anticoagulants (days)	54.36	59.34	0.655
Length of time using Corticoids (days)	73.06	56.72	0.013
KATZ	0.43	0.41	0.934

* Mann-Whitney test. Statistical significance was set at p≤0.05.

DISCUSSION

Hospitalization is recognized as a risk factor to the functional decline of the elderly, and may potentiate existing functional impairment due to factors such as malnutrition and polypharmacy, as well as previous conditions such as those related to advanced age, comorbidities, lifestyle, social and family risks, among others.[7]

Regarding the sociodemographic profile raised by this study, an average age above 70 years old was found, which requires public policies which favor the implementation of appropriate strategies for the needs of this population.[8] Elderly patients without schooling was predominant, which may cause poor health status due to poorer living habits, greater social exclusion, lower levels of information and unfavorable socioeconomic conditions for early access to health services, unfavorable conditions that consequently worsen quality of life.[9–10]

The elderly participants had comorbidities, especially hypertension and diabetes. Among the diseases most related to the aging process, the most prevalent are sensory alterations, bone and muscle diseases, cardiovascular diseases and diabetes, which causes sensory alterations in the aging process, making them more susceptible to skin injuries which can be aggravated by the delayed healing of wounds due to decreased vascularization.[11] In addition, aging causes changes in blood circulation and reduction of sweat and sebaceous glands, leading to disorders in thermoregulation and, consequently, dry skin.[12]

Regarding the hospitalized ICU population, the presence of comorbidities may increase the period of time being bed bound, leading to poor nutritional status, and are frequent causes of compromised skin integrity of the hospitalized elderly person.[3]

The prevalence was 28.7% and, although there are few studies in the literature to compare, it was found to be high. Research conducted in Brazil, Australia, Canada, Asia and the United States reported a prevalence of FI between 3.3% and 22% in hospital settings. The rate of 3.3% was in Brazil with hospitalized cancer patients.[3] A study of Danish elderly showed a prevalence of 4.6% .[13]

It is noteworthy that the study population consisted only of the elderly, which may also explain the high prevalence. It is known that the FIs are more prevalent among the elderly, because it derives mainly from the weaknesses of the body, such as the reduction of skin layers, its moisture reduction, elasticity and resistance, weaknesses that increase after 75 years of age.[7,14–15] The skin of the elderly has an epidermis with a flat interface between the epidermis and the dermis, making it less resistant to trauma due to shear forces, friction and/or dullness resulting in the separation of skin layers.[13]

Injuries were mainly identified in the lower limbs, which are usually caused when being transferred from wheelchairs or baths.[13] Lower limb location is also related to bed rails[3] and, in the present study, by being immobilized ICU patients, added to the lack of support through the companions, impaired cognition, presence of drains or catheters may explain the appearance of lesions in this body region.

In the present study, there was a high percentage of injuries without flap, predominating category 3, a situation similar to that found in another study.[1] The evaluation and classification of the injury are important for the choice of products and therapeutic actions, especially in the case of elderly population with prolonged hospitalization which causes treatment to be more difficult.[13]

Regarding the factors associated with FI, in addition to advanced age, comorbidities were identified in this study such as dry and scaly skin, physiological changes inherent to aging that expose the elderly to these injuries more than any other risk group due to weakening the skin; Old age and clinical condition also expose them by increasing their susceptibility to trauma.[14]

Other factors are also mentioned as associated with the occurrence of this injury: dependence to perform basic activities of daily living,[1–2] cognitive impairment and agitated behavior.[1] Photoaging is also highlighted, as it accelerates skin aging, contributing even more to its weakening, thereby increasing the risk for FI.[15]

A significant difference in the average time of corticosteroid use was also observed in this study, however, contrary to the literature, since the elderly with FI had the lower average of those without injury. Evidence shows that chronic use of corticosteroids can be considered a risk factor for FI due to side effects on collagen synthesis.[14] It is important to highlight that it was not raised if chronic use was used, but these were elderly with other comorbidities in severe clinical conditions, causing the use this medication for a long period of time necessary.

The fact that it was performed in only one institution caused limitations to the study, however it exposes important information on the epidemiology of this injury in the studied service, strengthening the knowledge on the subject, as well as instructing nursing professionals for prevention and control actions, which may improve care for hospitalized elderly.

CONCLUSION

The studied sample consisted of elderly with more than one comorbidity, who were dependent, and presented dry and scaly skin and bruising on the extremities. The prevalence of FI was 28.7%, a high prevalence associated with age, comorbidities, dry and scaly skin and mean time of corticosteroid use. Therefore, the results show that the occurrence of FI in hospitalized elderly patients in ICU is worrying, as in addition to the age factor, they have more serious clinical conditions that increase the possibility of this type of injury. It is suggested that more studies like this in other intensive care units are performed in order to raise the problem in hospital services, so that appropriate prevention and treatment measures are instituted.

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NOTES

CONTRIBUTION OF AUTHORITY

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Data collection: Vieira CPB, Ferreira PC.

Analysis and interpretation of the data: Vieira CPB, Ferreira PC, Araújo TME, Silva Júnior FJG, Galicia FT, Rodrigues ASO.

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APPROVAL OF ETHICS COMMITTEE IN RESEARCH

Approved by the Research Ethics Committee of the *Universidade Federal do Piauí*, opinion nº 2.085.462 and CAAE 68653517.1.0000.5214.

CONFLICT OF INTERESTS

There is no conflict of interest.

HISTORICAL

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