

## MEDICINES AND ITS RELATION TO THE DEVELOPMENT OF PRESSURE INJURY IN HOSPITALIZED-ELDERLY PEOPLE

Medicamentos e sua relação com o desenvolvimento de lesão por pressão em idosos hospitalizados

Medicamentos y su relación con la presión de desarrollo de lesiones en ancianos hospitalizados

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### ABSTRACT

**Objective:** the study's main purpose has been to identify the types of medication most used by hospitalized-elderly people, while relating them to the risk of developing pressure injury. **Method:** it is a descriptive and documental study, which was performed in a trauma referral hospital from the Fortaleza city, Ceará State. The sample consisted of 48 medical records and the data collection took place from August 2015 to February 2016. **Results:** through the analysis of 48 medical records from elderly patients hospitalized in both Intensive Care Unit and ward, the following results were found: the average age of those elderly individuals was 75 years old, with 54.2% being males and 45.8% being females. Bearing in mind the total, the drugs that appeared the most and were also related to the development of pressure injury were as follows: antihypertensives, analgesics, diuretics, vasoactive drugs and antibiotics. **Conclusion:** the types of medication most used by the elderly patients addressed in this study were directly related to alterations in their circulatory system.

**Descriptors:** Elderly people; Nursing; Pharmaceutical preparations; Skin; Injuries.

### RESUMO

**Objetivo:** identificar os tipos de medicamentos mais utilizados por idosos hospitalizados e relacioná-los com o risco de desenvolvimento de lesão por pressão. **Método:** estudo descritivo e documental, realizado em um hospital de referência em traumas de Fortaleza-CE. A amostra constituiu-se por 48 prontuários e a coleta de dados ocorreu no período de agosto de 2015 a fevereiro de 2016. **Resultados:** ocorreu a análise dos 48 prontuários de pacientes idosos acamados que se encontravam internados na Unidade de Terapia Intensiva e enfermaria. A média de idade desses idosos foi de 75 anos com presença de 54,2% do sexo masculino e 45,8% do sexo feminino. Desse total,

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os fármacos que mais apareceram e tem relação com o desenvolvimento da lesão são: os anti-hipertensivos, analgésicos, diuréticos, drogas vasoativas e antibiótico. **Conclusão:** os tipos de medicamentos mais utilizados nos idosos deste estudo estavam diretamente relacionados às alterações no sistema circulatório do idoso.

**Descritores:** Idoso; Enfermagem; Preparações farmacêuticas; Pele; Lesões.

## RESUMEN

**Objetivo:** identificar los tipos de medicamentos más utilizados por ancianos hospitalizados y relacionarlos con el riesgo de desarrollo de lesión por presión. **Método:** estudio descriptivo y documental, realizado en un hospital de referencia en traumas de Fortaleza, Ceará. La muestra se constituyó por 48 prontuarios y la recolección de datos ocurrió en el período de agosto de 2015 a febrero de 2016. **Resultados:** ocurrió el análisis de los 48 prontuarios de pacientes ancianos acamados que se encontraban internados en la Unidad de Terapia Intensiva y enfermería. El promedio de edad de estos ancianos fue de 75 años con presencia de 54,2% del sexo masculino y el 45,8% del sexo femenino. De ese total, los fármacos que más aparecieron y tienen relación con el desarrollo de la lesión son: los antihipertensivos, analgésicos, diuréticos, drogas vasoactivas y antibiótico. **Conclusión:** los tipos de medicamentos más utilizados en los ancianos de este estudio estaban directamente relacionados a las alteraciones en el sistema circulatorio del anciano.

**Descriptores:** Ancianos; Enfermería; Preparaciones farmacéuticas; Piel; Lesiones

## INTRODUCTION

Aging is a natural process that occurs throughout the life of the individual who submits the body to various physical, functional transformations and changes in skin conditions of the elderly.<sup>1</sup> With advancing age the dermis has reduced thickness, loss of elastic fibers and collagen, decreased defense cells, atrophy of apocrine and sebaceous glands that causes skin dryness and thus contributing to the development of Pressure Injury (PI) in the skin of the elderly patient.<sup>2</sup>

Bearing the aforesaid in mind, PI are skin or soft tissue lesions that may be superficial or deep, arising from an increase in external pressure that exceeds tissue perfusion pressure, most often developing over some bony protrusion. The elderly people are most at risk because they show fragile skin, malnutrition, reduced sensitivity, greater predisposition to chronic health problems and the presence of intrinsic factors such as changes in elimination, nutrition, circulation, skin sensitivity. at the level of consciousness and mobility. In addition to these factors, others of an extrinsic nature also favor the occurrence of the problem: pressure, friction, shear, moisture, and use of various types of medication.<sup>3</sup>

The use of a large number of drugs during the old age exposes elderly people to a more complex pharmacological therapy, often subjecting them to increased risks of drug interactions and adverse reactions, as well as causing cumulative toxicity due to impaired functions. of various organs, which modifies the activity of drugs.<sup>4</sup> All those factors are closely related to the body's metabolism, modifying the functions of skin cells, and becoming a risk factor for the development of PI.

Pressure injuries are a major challenge for nursing care, being one of the most common complications in patients with long hospital stays, either in Intensive Care Units (ICUs) or in wards. Its higher incidence in ICU patients is due to changes in vital functions, impaired mobility and the use of various types of medication.<sup>5</sup>

It is noteworthy that during the analysis of the collected data, it was found in all elderly participants the nursing diagnosis named Pressure Ulcer Risk, present in NANDA-I 2015-2017, which is related to pharmacological agents and others. predefined risk factors that strengthened diagnosis identification, such as: Braden Scale score <18, age limits, history of trauma, history of pressure ulcer, physical immobilization, reduced mobility, and medication use.<sup>6</sup>

Given the aforementioned framework, this study meant to identify the types of medication most used by hospitalized-elderly people, while relating them to the risk of developing pressure injury.

## METHODS

It is a descriptive and documental study that was performed by assessing the medical records of elderly patients admitted to a trauma hospital in the *Fortaleza* city, *Ceará* State. The records were selected after visits to units that serve the elderly and the identification of individuals who met predefined criteria. Inclusion criteria were as follows: aged 60 years old or older, bedridden, hospitalized in exclusive inpatient units for elderly care and in the ICU. There were excluded the patients whose medical records did not provide sufficient information to answer the questions raised by this study.

The sample consisted of 48 medical records and the sampling was for convenience. Data collection was carried out from August 2015 to February 2016, during a weekly visit to the aforementioned sectors. Data collection took place through structured observation and consultation of medical records with the application of an instrument particularly designed for this purpose.

The collection instrument allowed the following data to be obtained: gender, age, hospitalization date, medical diagnosis, presence or risk for developing pressure injuries and drugs used. The data was organized in a Microsoft Excel spreadsheet.

Ethical recommendations on research with human beings were all met, furthermore, the research was approved by the Research Ethics Committee from the *Universidade Estadual do Ceará (UECE)*, under protocol No. 679,888 and the *Certificado de Apresentação para Apreciação Ética (CAAE)* [Certificate of Presentation for Ethical Appreciation] No. 27561314.7.0000.5534.

## RESULTS AND DISCUSSION

There were analyzed 48 medical records of bedridden elderly patients who were admitted to the ICU and the ward. The mean age of these patients was 75 years old with 26 (54.2%) males and 22 (45.8%) females.

Considering the total sample, 26 elderly were admitted to the ICU and 22 were in the ward. Of this total 22 (45.8%) already had pressure injury and 26 (54.2%) were considered, according to predictive scales and hospital unit parameters, at risk for the development of the injury. Traumatic Brain Injury, Stroke, and Upper and Lower Limb Injuries were the medical diagnoses that most motivated hospitalizations. The most prevalent underlying diseases among the patients investigated in the medical records were diabetes 19 (39.6%) and hypertension 40 (83.3).

**Table 1** shows the classes of medications most frequently prescribed in the medical records of the elderly in the ICU and the ward, and the number of elderly people who used each therapeutic class. The classes that appeared most frequently were antihypertensive drugs, analgesics, diuretics, vasoactive drugs, and antibiotics.

**Table 1** - Classes of medications used at the ICU and the ward. Fortaleza city, Ceará State, Brazil, 2016.

Medication class (drug)	ICU	Ward
	f	f
Antihypertensive	03	16
Antihypertensive and analgesics	03	15
Diuretics	12	03
Vasoactive drug	10	-
Antibiotics	19	6

Legends: Intensive Care Unit (ICU)

The results showed that the elderly male population was more affected by fractures than the female population. This fact can be explained by the greater exposure of this population to major impact injuries, such as traffic accidents, higher morbidity associated with chronic diseases and the consequent use of a larger number of medications. Events associated with fractures in the elderly are commonly associated with loss of autonomy and independence and may lead to the development of pressure injury due to decreased decubitus change in the hospital environment.<sup>7</sup>

Due to trauma, elderly people suffer severe restriction of their daily activities, which can cause social isolation. Moreover, loss of independence as a result of trauma may be a reason for institutionalization, which, according to the literature, increases the predisposition to risk factors for the development of pressure injuries, such as decreased movement, edema, weakness of limbs and adverse effects caused by the use of multiple medications.<sup>8</sup> Therefore, nursing work, in line with an interdisciplinary team, in order to minimize complications, is of paramount importance, ensuring better patient care and better quality of life.<sup>9</sup>

As the aging process progresses, changes in the elderly's homeostatic adaptation capacity lead to an increase in the prevalence of chronic degenerative diseases. The changes caused by these diseases are marked and contribute to the development of pressure injury in these people.<sup>10</sup>

Nowadays, chronic diseases such as diabetes and systemic arterial hypertension represent an important public health

problem in Brazil, being considered in epidemiological studies as commonly associated conditions. The prevalence of hypertension is approximately twice as high among people with diabetes compared with those without diabetes.<sup>11</sup>

The various structural and physiological changes caused in the cardiovascular system by the progressive aging process lead to decreased functional capacity, leading to the development of chronic diseases, being a risk factor, especially for the development of systemic arterial hypertension.<sup>12</sup> Hypertension predisposes to weight gain that associated with circulatory problems might cause a deficiency in the skin nutrition of the patient, then being a risk factor for developing PI.<sup>13</sup>

It is important to note that the tissue repair process in individuals with Diabetes Mellitus is slow due to excessive production of reactive oxygen species and decreased nitric oxide, response to growth factors, and insulin signaling pathway proteins.<sup>14</sup>

The nurse included in this context should provide care directed to the individual needs of the elderly people, applying their theoretical and practical knowledge, aiming to overcome the difficulties caused by chronic diseases.

The risk of pressure injury in the elderly involves numerous risk factors such as changes in the skin as they age, prolonged pressure on the tissue, immobility, especially in patients staying in intensive care units, mobility, loss of protective reflexes, sensory deficit, poor skin perfusion, edema, malnutrition, vitamin deficiency, friction, shear forces, trauma, altered skin moisture, advanced age, debilitation, the use of traction and containment equipment. Another extreme risk factor is the use of medications that can influence the development of pressure injuries in the elderly, due to systemic transformations that cause severe reactions in the body.<sup>15</sup>

Some pharmacological classes may increase the risk of pressure injury in the elderly, such as antihypertensive drugs, analgesics, diuretics, vasoactive drugs and antibiotics.

The high prevalence of hypertension among the elderly makes this population subject to greater use of antihypertensive drugs and their potential adverse effects caused by drug interactions. Continued use of these drugs reduces blood flow and tissue perfusion, leaving patients more vulnerable to pressure, which facilitates the development of PI.<sup>15</sup>

Associated with the aforesaid, it is common for elderly patients to use more than one active ingredient in these drugs. Therefore, the routine use of antihypertensive medications, including time, route of administration, medication and correct dose, when performed without the active supervision of the professional nurse, might induce pharmacological interactions, causing circulatory alterations, which have as a reflex a reduction. tissue nutrition, which is an important risk factor for the development of pressure injuries.<sup>16</sup>

The simultaneous use of antihypertensive drugs and risk factors such as prolonged pressure on the tissue, immobility, impaired mobility, loss of protective reflexes, sensory deficit, poor skin perfusion and edema, conditions that contribute to the occurrence of PI.<sup>9</sup>

Regarding the use of analgesic drugs, when administered concomitantly with antihypertensive drugs, they are also

characterized as a risk factor for the development of pressure injuries. Analgesics cause a reduction in the natural stimulus to shift position at discomfort, causing increased pressure on the tissues.<sup>9</sup> Hence, patients who use this combination of drugs have an increased risk of immobility and tend to have a reduction in the change in bed position, then facilitating the development of PI.

Diuretic drugs also frequently appeared in patients' prescriptions. Considering that diuretic drugs work to regulate body water volumes, when they are used in very high doses and administered to elderly patients, they can cause hydroelectrolytic imbalance. Additionally, these medications may cause postural hypotension, dizziness, frequent urination, and other effects that may lead to falls in these patients, resulting in a decline in functional capacity.<sup>17</sup>

So, this drug class may cause disturbances in homeostasis, poor hydration of the skin tissue and risk factors for trauma, contributing to the occurrence of skin lesions. This is due to changes in the cascades of reactions in the body caused by electrolyte disturbances promoted by this drug class, which may increase the toxicity of several drugs that predispose to digitalis intoxication, changes in homeostasis and skin tissue nutrition. In addition, uncontrolled use of this drug may cause signs and symptoms, such as facial flushing and edema in the lower limbs, indicators of circulatory problems.<sup>18</sup>

Vasoactive drugs, when administered in high doses, act atypically, reducing tissue perfusion. This reduction in tissue perfusion, when associated with skin changes, aging characteristics, such as loss of elasticity, poor skin hydration and loss of sensation, becomes an important risk factor for the development of pressure lesions.<sup>19</sup>

Many of the elderly people who participated in the study and were admitted to the ICU had circulatory impairment during the surgical procedure to which they underwent, resulting in hypotension and alteration of tissue perfusion. This is often due to pharmacological changes or excess doses of vasoactive drugs, causing imbalance and reflecting a problem in skin nutrition and integrity.<sup>20</sup>

Another pharmacological class whose inappropriate use, in addition to generating significant hospitalization costs due to adverse effects, can also lead to hypersensitivity reactions, edema and systemic reactions that compromise the transport of oxygen, nutrients and defense cells, are antibiotics.<sup>21</sup> Among those changes, there are those related to the immune system, such as the reduction of defense cells that act directly on the body's immunity and functionality, leading to frailty, are significant risk factors for the development of pressure injury in the elderly patient.

The increased use of this type of drug in the ICU is justified by the fact that most patients hospitalized in this sector have deficiencies in the immune system, being more susceptible to the proliferation of diseases caused by various types of microorganisms.<sup>22</sup>

From this perspective, the nurse needs to take a close look at the prescribed drugs, given that the use of medications such as antihypertensive drugs, analgesics, diuretics, vasoactive drugs and antibiotics is a risk factor for the development of

pressure injuries. Therefore, greater care and attention in drug administration is required, with careful observation of timing, drug type, dose, and possible pharmacological interactions.

Furthermore, nursing care should focus on seeking up-to-date information, developing a care plan, implementing relevant actions, and evaluating outcomes.<sup>23</sup> Thus, nursing care with older people at risk for The development of these lesions are essential, considering the design of strategies capable of meeting the specific needs for taking care of each patient.

## CONCLUSIONS

Herein, it was possible to identify the types of medication most used by hospitalized-elderly people, as well as their intrinsic relation with the risk of developing pressure injury. The types of medication most used by the elderly patients addressed in this study were directly related to alterations in their circulatory system. These conclusions are also addressed by the literature through the use of vasoactive, diuretic and antihypertensive drugs.

When those drugs are co-administered with other medications, they might alter their active principle or form of action, then causing a change in the body and also altering the circulatory system and nutrition of the elderly's skin tissue. Therefore, reducing the turgor and elasticity of the skin, thus being a risk factor for developing pressure injury.

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