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METABOLIC PROFILE ASSOCIATED WITH RISK OF SURGICAL POSITIONING-RELATED INJURIES IN ELDERLY PATIENTS

PERFIL METABÓLICO ASSOCIADO AO RISCO DE LESÕES DECORRENTES DO POSICIONAMENTO CIRÚRGICO EM PACIENTES IDOSOS

PERFIL METABÓLICO ASOCIADO AL RIESGO DE LESIONES POR POSICIONAMIENTO QUIRÚRGICO EN PACIENTES ANCIANOS

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ABSTRACT

Introduction: Aging is not determinative of the presence of pathologies; however, it is common to observe the incidence of noncommunicable chronic diseases in the elderly. Consequently, complications related to the circulatory system may arise, indicating the need for surgeries. Positioning-related injuries are possible complications in surgical procedures, and to identify them, the Escala de Avaliação de Risco para o Desenvolvimento de Lesões Decorrentes do Posicionamento Cirúrgico was developed.

Objective: To explore the relation between the metabolic profile and the risk of injuries due to surgical positioning in elderly cardiac surgery patients.

Methods: This is an observational, descriptive study with a quantitative approach. The sample consisted of individuals aged 60 or older undergoing elective cardiac surgeries. Data collection occurred between November 2020 and April 2024, using the following instruments: sociodemographic and clinical questionnaire and the Escala de Avaliação de Risco para o Desenvolvimento de Lesões Decorrentes do Posicionamento Cirúrgico.

Results: A sample of n = 12 elderly patients in the preoperative period of cardiac surgery was presented, the majority of whom were female and aged 60 to 64 years old. The prevalent ethnicity was brown, and the most common chronic disease was diabetes mellitus.

Conclusion: Systemic arterial hypertension and diabetes was the main highlight of the metabolic profile of elderly patients undergoing cardiac surgery, which obtained a high risk for the development of injuries. Thus, based on this association, specific care plans can be implemented for each individual, enhancing the safety of surgical patients.

Keywords: Aged; Chronic Disease; Patient Positioning; Perioperative Nursing; Risk Factors; Thoracic Surgery.

RESUMO

Introdução: O envelhecimento não é determinante de presença de patologias, porém, é comum observar a incidência de doenças crônicas não transmissíveis em idosos. A partir disso, complicações relacionadas ao sistema circulatório podem surgir e indicar a necessidade de cirurgias. Lesões por posicionamento são complicações possíveis em procedimentos cirúrgicos e, para identificá-las, foi criada a Escala de Avaliação de Risco para o Desenvolvimento de Lesões Decorrentes do Posicionamento Cirúrgico.

Objetivo: Explorar a relação entre o perfil metabólico e o risco de lesões por posicionamento cirúrgico em pacientes idosos de cirurgias cardíacas.

Métodos: Trata-se de um estudo observacional, descritivo com abordagem quantitativa. A amostra foi composta por indivíduos com 60 anos ou mais, submetidos a cirurgias cardíacas eletivas. A coleta de dados ocorreu entre novembro de 2020 e abril de 2024, com uso dos instrumentos: questionário sociodemográfico e clínico e a Escala de Avaliação de Risco para o Desenvolvimento de Lesões Decorrentes do Posicionamento Cirúrgico.

Resultados: Foi apresentado um n = 12 de pacientes idosos no período pré-operatório de cirurgia cardíaca, dos quais, a maioria do sexo feminino e na faixa etária de 60 a 64 anos. A etnia prevalente foi a parda e a doença crônica mais comum foi a diabetes mellitus.

Conclusão: A hipertensão arterial e diabetes foram os principais destaques do perfil metabólico dos idosos submetidos à cirurgia cardíaca, o qual obteve alto risco para o desenvolvimento de lesões. Logo, a partir dessa associação é possível realizar planos de cuidados específicos para cada indivíduo, elevando a segurança dos pacientes.

Palavras-chave: Cirurgia Cardíaca; Doença Crônica; Enfermagem Perioperatória; Fatores de Risco; Idoso; Posicionamento do Paciente.

RESUMEN

Introducción: El envejecimiento no es un determinante de la presencia de patologías, sin embargo, es común observar la incidencia de enfermedades crónicas no transmisibles en las personas mayores. De esto pueden surgir complicaciones relacionadas con el sistema circulatorio e indicar la necesidad de cirugía. Las lesiones por posicionamiento son posibles complicaciones en los procedimientos quirúrgicos y, para identificarlas, se creó la Escala de Evaluación de Riesgos para el Desarrollo de Lesiones Resultantes del Posicionamiento Quirúrgico.

Objetivo: Explorar la relación entre el perfil metabólico y el riesgo de lesiones por posicionamiento quirúrgico en pacientes ancianos de cirugía cardíaca.

Métodos: Se trata de un estudio observacional, descriptivo, con enfoque cuantitativo. La muestra estuvo compuesta por personas de 60 años o más, sometidas a cirugía cardíaca electiva. La recolección de datos se realizó entre noviembre de 2020 y abril de 2024, mediante los instrumentos: cuestionario sociodemográfico y clínico y la Escala de Evaluación de Riesgos para el Desarrollo de Lesiones Derivadas del Posicionamiento Quirúrgico.

Resultados: Se presentaron n = 12 pacientes ancianos en el preoperatorio de cirugía cardíaca, la mayoría del sexo femenino y con edades entre 60 y 64 años. La etnia predominante fue mestiza y la enfermedad crónica más común fue la diabetes mellitus.

Conclusión: La hipertensión arterial y la diabetes fueron los principales destaques del perfil metabólico de los ancianos sometidos a cirugía cardíaca, los cuales presentaban alto riesgo

para el desarrollo de lesiones. Por ello, desde esta asociación es posible crear planes de cuidados específicos para cada individuo, aumentando la seguridad del paciente.
Descriptores: Anciano; Cirugía Cardíaca; Enfermedad Crónica; Enfermería Perioperatoria; Factores de Riesgo; Posicionamiento del Paciente.

INTRODUCTION

Ageing is a natural process characterized by a progressive decline in the body's physiological integrity and regenerative capacity[1]. Although aging is not totally related to the origin of diseases, there is a higher incidence of Chronic Non-Communicable Diseases (CNCD) in the elderly, the main ones being Systemic Arterial Hypertension (SAH), Diabetes Mellitus (DM) and Dyslipidemia[2].

If not treated properly, some of the possible complications are diseases related to the circulatory system. In Brazil, cardiovascular disease is the leading cause of death and one of its basic treatments is surgery. Classified as major surgery, patients undergoing this type of surgery spend a long period of time on the operating table in a single position, resulting in a greater chance of developing injuries[3].

The main objective of surgical positioning is adequate surgical visualization. However, complications resulting from surgical positioning are frequent, with Pressure Injuries (PI) standing out, but they can also result in musculoskeletal pain, dislocation of joints, damage to peripheral nerves, cardiovascular and pulmonary impairment[4].

The risk factors associated with PPL resulting from surgical positioning are inherent to the patient and the procedure. Comorbidities such as systemic arterial hypertension and diabetes mellitus, age, nutritional status, body surface area and anesthetic risk, according to the American Society of Anesthesiologists (ASA) classification, are patient-related factors[5].

To identify and address the risks faced by patients undergoing any type of surgery, the Risk Assessment Scale for the Development of Injuries Related to Patient Surgical Positioning (ELPO) was created. This predictive, validated scale was developed in Brazil by Lopes in 2013[6].

This scale takes into account the risk factors based on the best available evidence, namely: type of surgical position, type of anesthesia, surgical time, type of support surface, limb position and patient-related factors such as age and comorbidities, with the aim of obtaining adequate accommodation, absence of risks and performing a safe and efficient surgical procedure[7].

From this perspective, proper surgical positioning ensures efficiency and safety during the procedure and is one of the main indicators of quality of care in perioperative care.

Considering the elderly profile, marked by chronic conditions that can have significant systemic impacts, this study aims to explore the relationship between the metabolic profile and the risk of surgical positioning injuries in elderly patients undergoing cardiac surgery.

METHODS

This is research with an observational and descriptive approach, focusing on quantitative analysis, carried out in the operating room of a large university hospital located in the metropolitan region of Natal, Rio Grande do Norte State, Brazil.

The sample included patients who underwent elective heart surgery during the data collection period, specifically elderly people, classified according to the Statute of the Elderly Person, aged 60 or over, of both sexes and who were able to take part in the interview. Individuals under the age of 60, patients undergoing emergency surgery and those in isolation were excluded. Therefore, the sample selection was conducted by convenience, with a total of 12 participants.

Data collection took place during the immediate preoperative period, specifically in the admission room and the post-anesthetic recovery room, between December 2020 and January 2021, and again between December 2023 and April 2024. This interval was due to the need to renew the project annually with the ethics committee. The researchers approached patients who met the inclusion criteria. Subsequently, the participants were invited to collaborate in the research after receiving detailed information about the study, the possible risks involved and a guarantee that the information would remain confidential. Participation was conditional on authorization, obtained by signing the Informed Consent Form (ICF).

At this stage, the first instrument, a sociodemographic and clinical questionnaire developed by the researchers and based on the literature by Lopes[6], was used through verbal collection, in which skin integrity was assessed, as well as possible motor and sensory deficits. Then, after positioning the patient on the operating table, the second instrument, the ELPO, developed and validated by Lopes[6], was applied during the transoperative period by the researcher.

The data was then entered into a Microsoft Excel® spreadsheet and organized into an electronic database. The sample was characterized by processing the data in a descriptive analysis. It is important to note that the research project was approved by the Research Ethics Committee (REC) of the Federal University of Rio Grande do Norte, under opinion no. 4.138.113, CAAE 30098220.2.0000.5537, in accordance with Resolution no. 466/2012 of the National Health Council.

RESULTS

This study followed 44 individuals undergoing cardiac surgery procedures. Of these patients, 12 were selected for analysis because they were within the established age range, i.e. 60 years or older. This delimitation was carried out with the aim of establishing a specific sample profile for investigations related to the elderly population in this surgical context.

The majority of participants were female, 58.4% (n = 7), of mixed-race ethnicity, 83.3% (n = 10), with an average age ranging from 60 to 64 years, 41.6% (n = 5). Regarding the main comorbidities, the prevalence of systemic arterial hypertension was identified at 83.3% (n = 10), and 62.5% (n = 6) of the cases had a body mass index indicating overweight (Table 1↗).

Regarding the data obtained from the ELPO, only a small proportion of the sample studied (25%, n = 3) presented results with values ≤ 19 points; consequently, there was a high rate of high-risk scores (75%, n = 9) for the development of surgical positioning injuries (Table 2↗).

DISCUSSION

Analysis of the data revealed a significant prevalence of females, representing 58.4% of the participants. This female predominance can be attributed to the observation of a higher incidence and cardiovascular mortality among men at older ages, in addition to the higher probability of survival among women[8]. IBGE data from 2019 corroborates this trend, with 39% of women reaching 80 years of age, compared to 23% of men[9]. These factors, when taken together, contribute to a greater representation of the female gender in population study samples.

Regarding the age of the patients, the age group between 60 and 64 years (41.6%) predominated. In a study carried out in a private hospital in São Paulo, Brazil, similar data were found, showing that with advancing age, the incidence of pressure injuries increased, with a higher incidence in elderly patients aged 65 years or older[11]. It is known that the skin of the elderly undergoes changes inherent to the physiological aging process, such as reduced elasticity, texture, loss of muscle mass, decreased inflammatory response and subcutaneous tissue, making them more susceptible to pressure and, consequently, to the development of tissue damage[12].

When evaluating the patients, it was identified that most self-declared themselves to be brown, 83.3%, a result similar to the study in Teresina-PI, which identified a predominance of brown skin color in the population investigated[13]. As for the physiology of the skin, its structure varies according to color, so that, in the black or brown race, the structure of the stratum corneum is more compact, which provides greater resistance to the skin in the face of chemical irritations and/or traumas. White skin, on the other hand, is more vulnerable to pressure injuries[14].

In the context of chronic diseases, a high prevalence of Systemic Arterial Hypertension (SAH) and Diabetes Mellitus (DM) is observed among the patients in the sample, with rates of 83.3% and 58.4%, respectively. These findings are consistent with studies involving patients undergoing surgeries, which indicate a significant increase in the risk of perioperative complications, including positioning injuries, particularly in elderly individuals[15-17].

In physiopathological terms, SAH is responsible for triggering heart diseases that impair blood flow, result in a reduction in tissue perfusion and increase susceptibility to injury[18]. Furthermore, when associated with DM, this condition contributes to an additional decrease in blood flow, compromising tissue perfusion and interfering with healing capacity due to the difficulty in replacing endothelial cells[19].

Corroborating the profile of the elderly in this sample, a longitudinal study conducted in surgical centers in northern Italy also identified age, diabetes mellitus, heart, and vascular diseases as significant risk factors for the development of pressure injuries related to surgical positioning[20]. Additionally, other literature complements this by indicating that the prevalence of these comorbidities is higher in the elderly female population[21,22].

When evaluating the BMI values of the sample, there was a significant presence of overweight (62.5%) and obesity in stages I (8.3%) or III (8.3%), together with diagnoses of SAH and DM in 87% of the elderly patients. Overweight and obesity are risk factors for the development of perioperative positioning injuries. This is due to the possible compression of blood vessels and dependent nerve structures by the increase in fat mass, which leads

to reduced tissue perfusion and prolonged surgery time[23]. Furthermore, this coexistence of factors is highlighted in the literature as a potential indicator of surgical failure[24,25].

From this context, the sample showed that 75% of patients were at high risk (score ≥ 19 points) of developing injuries resulting from surgical positioning in PFO. Thus, given this scenario, the importance of incorporating preventive assessment for surgical positioning injuries in elderly patients undergoing cardiac surgery is evident. It is also essential to improve interventions in the risk indicators measured by the scale, in order to prevent and mitigate the incidence of these injuries[26].

In short, given the susceptibility to developing surgical positioning injuries, the need for a personalized and multidimensional approach to perioperative assessment is highlighted. Early identification of metabolic risk factors, such as hypertension, DM and overweight, allows for the implementation of effective preventive interventions aimed at improving surgical outcomes and reducing complications.

Moreover, the present study has some limitations, particularly related to the sample size, which was restricted due to the exclusive inclusion of individuals over 60 years of age who underwent cardiac surgeries. This limited approach prevents the generalization of the results, as they are specific to this population group and depend on the frequency of cardiac surgeries at the university hospital where the data were collected. However, it is important to emphasize that these limitations did not compromise the reliability of the results and analyses conducted in this study.

CONCLUSION

With the development of this research, it was possible to relate the metabolic profile to the application of ELPO in elderly patients undergoing cardiac surgeries. In this regard, a prevalence of patients at high risk of developing injuries due to surgical positioning was observed, as well as patients with systemic arterial hypertension, diabetes mellitus, and overweight, factors that directly influence the increased risk of injury, in addition to the aspect of age.

From this perspective, data such as these are essential for the perioperative team to evaluate the specific characteristics of each patient, thereby deciding on and planning individualized interventions and care plans. By improving care, this contributes to patient safety and helps prevent complications associated with surgical positioning.

Furthermore, new research on this topic is suggested, focusing on the elderly population, with the aim of obtaining more clinical evidence regarding its application in practice. Additionally, the development of intervention proposals is encouraged to contribute to the improvement of perioperative nursing care.

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SX: Supervision.
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Table 1 – Clinical characteristics of elderly people undergoing heart surgery (N=12).

Items	n	%
Gender		
Male	5	41.6
Female	7	58.4
Age (years)		
60-64	5	41.6
65-69	2	16.7
70-74	4	33.4
Above 75	1	8.3
Ethnicity		
White	2	16.7
Brown	10	83.3
Comorbidities		
Systemic arterial hypertension	10	83.3
Diabetes mellitus	7	58.4
Body Mass Index		
Eutrophic (18,5-24.9 Kg/m^2)	4	33.4
Overweight (25-29.9 Kg/m^2)	6	62.5
Obesity I (30-34.9 Kg/m^2)	1	8.3
Obesity III (above 40 Kg/m^2)	1	8.3

Table 2 – ELPO scale scores and final scores of elderly patients undergoing cardiac surgery (N=12).

Items	n	%
ELPO score		
19 points	3	25
20 points	6	50
21 points	2	16.7
26 points	1	8.3
ELPO risk level		
Low risk (7 to 19 points)	3	25
High risk (20 to 35 points)	9	75