

Risk assessment for the development of perioperative lesions due to surgical positioning



Avaliação do risco para o desenvolvimento de lesões perioperatórias decorrentes do posicionamento cirúrgico

Evaluación del riesgo para el desarrollo de lesiones perioperatorias derivadas del posicionamiento quirúrgico

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How to cite this article:

Oliveira HMBS, Santos AMJF, Madeira MZA, Andrade EMLR, Silva GRF. Risk assessment for the development of perioperative lesions due to surgical positioning. Rev Gaúcha Enferm. 2019; 40(esp):e20180114. doi: <https://doi.org/10.1590/1983-1447.2019.20180114>.

ABSTRACT

Objective: To evaluate the risk of developing perioperative lesions due to surgical positioning in patients submitted to elective surgeries.

Methods: This is an analytical and longitudinal study carried out with 45 patients in a public hospital of medium and high complexity in the state of Piauí. The following data was used: perioperative evaluation instrument, Numerical Visual Scale, Braden Scale and the Risk Assessment Scale for the Development of Injuries from Surgical Positioning (ELPO).

Results: Participants aged ≥ 46 years had a higher risk, and there were 33.4% of hypertensives among the 35.6% with comorbidities. The most prevalent position, with 64.5% was supine, with only 2.2% cases of pre-surgical injury. Regarding the risk for positional lesions, 68.9% presented low risk.

Conclusions: 31.1% of the participants were at high risk for developing positional lesions, related to age and comorbidities.

Keywords: Perioperative nursing. Patient positioning. Patient safety. Risk assessment.

RESUMO

Objetivo: Avaliar o risco de desenvolvimento de lesões perioperatórias decorrentes do posicionamento cirúrgico em pacientes submetidos a cirurgias eletivas.

Métodos: Trata-se de um estudo analítico e longitudinal realizado com 45 pacientes em um hospital público de média e alta complexidade no estado do Piauí. Foram utilizados para a coleta de dados: instrumento de avaliação perioperatória, Escala Visual Numérica, Escala de Braden e da Escala de Avaliação de Risco para o Desenvolvimento de Lesões Decorrentes do Posicionamento Cirúrgico (ELPO).

Resultados: Participantes com idade ≥ 46 anos apresentaram maior risco, com 33,4% de hipertensos dentre 35,6% dos que apresentaram comorbidades. A posição mais prevalente com 64,5% foi a supina, com apenas 2,2% casos de lesão pré-cirúrgica. Em relação ao risco para lesões por posicionamento, 68,9% apresentaram baixo risco.

Conclusão: 31,1% dos participantes foram submetidos a risco elevado para desenvolver lesões por posicionamento, relacionado a idade e comorbidades.

Palavras-chave: Enfermagem perioperatória. Posicionamento do paciente. Segurança do paciente. Medição de risco.

RESUMEN

Objetivo: Evaluar el riesgo de desarrollo de lesiones perioperatorias derivadas del posicionamiento quirúrgico en pacientes sometidos a cirugías electivas.

Métodos: Se trata de un estudio analítico y longitudinal realizado con 45 pacientes en un hospital público de mediana y alta complejidad en el estado de Piauí. Se utilizaron para la recolección de datos: instrumento de evaluación perioperatoria, Escala Visual Numérica, Escala de Braden y de la Escala de Evaluación de Riesgo para el Desarrollo de Lesiones Trascorrentes del Posicionamiento Quirúrgico (ELPO).

Resultados: Participantes con edad ≥ 46 años presentaron mayor riesgo, con 33,4% de hipertensos de entre el 35,6% de los que presentaron comorbidades. La posición más prevalente con el 64,5% fue la supina, con apenas 2,2% casos de lesión pre quirúrgica. En relación al riesgo para lesiones por posicionamiento, 68,9% presentaron bajo riesgo.

Conclusión: 31,1% de los participantes fueron sometidos a riesgo elevado para desarrollar lesiones por posicionamiento, relacionado con la edad y las comorbidades.

Palabras clave: Enfermería perioperatoria. Posicionamiento del paciente. Seguridad del paciente. Medición de riesgo.

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■ INTRODUCTION

The change in the epidemiological profile and the increase in the life expectancy of the population led to an increase in the complexity of surgical procedures. The prevalence of chronic diseases lead to the need for continuous treatment and to discussions and dependency, referring patients with increasingly complex cases to "surgical anesthetic practice" thus implicating in the planning of assistance⁽¹⁾. In February 2017, throughout the national territory, 48,100 hospitalizations took place, 730 of which were in the state of Piauí, for surgeries of the genital-urinary, circulatory and musculoskeletal systems, in addition to thoracic surgeries⁽²⁾.

The position of the patient in the perioperative period is a responsibility of the entire surgical team, and is a variable according to the procedure planned, aimed at avoiding maladies⁽³⁾. Its objectives are the adequate surgical visualization, the guarantee of the patient's dignity through avoiding inappropriate exposure and establishing the airways, venous access, devices and equipment for monitoring, in addition to promoting adequate perfusion and circulation, protecting muscles, nerves and bone prominences⁽⁴⁻⁵⁾.

The main risk factors for the development of perioperative lesions include: age, weight, mobility, general health state and/or associated comorbidities, especially diabetes or vascular disease, length of surgery, excessive humidity, pain, surgical risk classification from the American Society of Anesthesiologists (ASA) and the impact of anesthesia⁽⁵⁻⁷⁾.

Despite the many advances in the medical-surgical field, there are still little guidance for the health care routine concerning actions related to the safety of patients and the ergonomics of the professionals when it comes to surgical positioning. However, the availability of equipment or their lack of adequacy were reported as decisive factors for adverse events, especially involving operative beds and arm boards in situations that demand the patient to be in prone, lateral or lithotomic positions⁽⁵⁾.

Direct and localized prolonged pressure may result in changes in the capillary blood flow to the structures, leading to arterial hypotension and increasing venous pressures, consequently leading to lesions through pressure, nervous and visual lesions. In a study conducted with 172 patients, 12.2% presented some type of perioperative lesion⁽⁸⁾. From these, 9.9% reported intense pain in pressure points and 4.7% reported peripheral neuropathy. From these, 3.5% were sensitive and 1.2% was motor neuropathy. Thus, anatomic damages such as pressure lesions, nervous damage and systemic physiological alterations can be consequences inherent to positioning^(3,6-9).

Such incidence is worrying, and requires greater efforts in the setting, since the repercussions of the damage provoked involve an increasingly long hospitalization period, the need to readdress limitations or disabilities of the patient, in addition to increasing the costs to health services.

Therefore, this study aimed at evaluating the risk of developing perioperative lesions resulting from surgical positioning in patients undergoing elective surgeries.

■ METHOD

Longitudinal and analytical study, conducted in a hospital of medium-to-high complexity, a reference in the state of Piauí. It was elaborated from the monograph presented as the nursing degree conclusion paper at the Federal University of Piauí⁽¹⁰⁾, from September to November 2017. The population of the study included 5 patients who had undergone elective surgeries. The sample was selected by convenience and made up of 45 patients who fit the following inclusion criteria: being 18 years old or older and undergoing gynecological, cardiovascular, urological, or orthopedic surgeries. The exclusion criteria included those who had restrictions that prevented the application of the assessment instruments or had their surgeries cancelled.

Data collection was carried out using a form with socio-demographic (gender, age, profession, origin) and clinical data (Body Mass Index - BMI, comorbidities, pain related to the surgical site and other types of pain in both before and after the operation, pressure lesions (PL) in the preoperative stage, previous pressure lesion, risk classification according to the Braden Scale and physical limitations⁽¹¹⁾). The Scale for the Assessment of the Risk of Developing Lesions Resulting from the Surgical Positioning (ELPO), validated in Brazil, was also used⁽¹¹⁾. The scale is made up of seven items (type of surgical position, length of surgery, type of anesthesia, support surface, position of the limbs, comorbidities, and the age of the patient), measured in a five-point Likert scale. The final score can vary from seven to 35 points, and patients with a score of 20 or higher were classified as having being under a greater risk⁽¹¹⁾. The Visual Number Scale has as one of its objectives the attribution of a score from 0 (no pain) to 10 (maximum pain) through a ruler printed to track pain and measure it when present, facilitating the understanding of patients with good visual acuity. Among patients with reduced visual acuity this process was carried out verbally.

The possible participants of the research were identified through surgical schedules according to the studied specialties, confirming their inclusion in the research after signing the Free and Informed Consent Form (FICF). In this moment, the first assessment was carried out. The integri-

ty of the skin was observed, as well as possible motor and sensitive deficits and the application of the pre-operative instrument, the Braden Scale, and the Numerical Visual Scale for pain tracking. Complementary data was acquired from the patients' records.

The second assessment was conducted at the time the patient entered in the surgical room, before anesthetic induction, filling the first part of the ELPO. It was finished in the immediate post-operative stage in the Post-Anesthetics Recovery Room or in the Intensive Care Unit, depending on the surgery conducted and on data regarding the time and variation of positions during the procedure.

On later evaluations, the post-operative instrument was applied until the discharge of the patients or until the fourth day, if they were to stay in the room for a longer period. For seven participants, the last day of the field research was 11/01/2017, as they had been on the post-operative stage for four days already and had not been discharged until this date which, due to statistical reasons, was selected as the last day of the research.

Data from the study were processed in the software IBM® SPSS® 21.0. Descriptive statistics were calculated for the quantitative variables, such as means, medians, standard deviation, interquartile range, minimums and maximums; for the qualitative ones, the frequencies were found. In the inferential analysis, the Chi-Square Pearson's test was used to find the associations between the risk of developing pre-operative lesions and the characteristics of the patients. When the assumptions of this test were not confirmed, Fisher's Exact test was conducted. The variables were dichotomized to calculate effective measures. For the quantitative variables, the median of data distribution was considered for categorization. For the significant associations, the reason of prevalence (RP) and its respective confidence interval (CI) were calculated. The percentages on the contingency table were calculated in relation to the total sample. The significance level as that of 5%.

National and international ethical norms for researches involving human beings were respected. This research was authorized by the reference state hospital and approved by the Research Ethics Committee at the Federal University of Piauí, under protocol n.º 2.256.511. The research was in accordance to Resolution 466/2012 from the National Council of Health, which regulates research projects involving human beings as a whole⁽¹²⁾.

■ RESULTS

From the 55 individuals initially listed, 45 patients effectively participated in the research. The losses were due to

cancelled surgeries. Their mean age was 50.9 (± 15.6), with a minimum of 22.0 and a maximum of 88.0 years of age. Most patients were female 35 (77.8%); 16 (35.6%) were maids and 14 (8.9%) household workers, while 11 (24.4%) were retired and 24 (53.3%) came from the capital of Piauí or other municipalities in the state, 21 (46.7%). They were classified according to their clinical aspects (Table 1), evaluated and classified according to the risk for the development of perioperative lesions resulting from surgical positioning (Table 2). The associations between the risk and the characteristics of the patients were verified (Table 3).

The body mass index of the patients was, on average, ($\pm DP$), 25.2 (± 4.6) kg/m², varying from 15.8 a 26.8 kg/m². 16 patients (35.6%) presented some comorbidity, standing out: systemic arterial hypertension in 15 (33.4%), vascular disease in 10 (22.2%), Diabetes Mellitus in 5 (11.1%) and heart disease in 5 (11.1%). Pre-operative surgical site related pain had a mean of 5.3 (± 2.3), varying from 4.0 to 8.0 points in the visual scale for the 3 patients (6.7%) who presented it, while pre-operative pain that was unrelated to the surgical site in the pre-operative had a mean result of 5.4 (± 2.3), varying from 3.0 to 9.0, among the 5 (11.1%) which stated to feel it (Table 1).

Pre-operative pressure lesions were presented by one (2.2%) patient, and 3 (6.7%) had a history of previous PL. 4 patients (8.9%) were classified as at risk for developing pressure lesions in some level, according to the evaluation of Braden Scale, while 8 (17.8%) presented some physical limitation, mostly associated to age 5 (11.1%) and paralysis 2 (4.4%). Post-operative pain related to the surgical site had an average of 3.5 (± 0.7), varying from 3.0 to 4.0 points in the visual scale, for the 2 (4.4%) patients who presented it. Only one (2.2%) patient related post-operative pain unrelated to the surgical site, with a 2.0 level in the visual scale (Table 1).

The development of pressure lesions was evaluated in the immediate post-operative and up to the fourth day after surgery. Only one (2.2%) patient had this problem. 38 patients (84.4%) received hospital discharge and 7 (15.6%) were hospitalized for a period of time longer than that of data collection. The mean interval of the evaluation between the surgery and the last evaluation of the patient was 5.5 (± 9.1) days, varying from one to 33 days.

The mean ELPO score was 16.9 (± 3.9), with a minimum of 9 and a maximum of 25.0. In the end, 14 (31.1%) patients who underwent the elective surgeries were classified as being at a higher risk, while 31 (68.9%) presented lower risks.

The highest score medians ($\pm IQR$) were found in the surface support items 4.0 (± 3.0), with a maximum of 4.0, and type of anesthetic 3.0 (± 1.0), with a maximum of 5.0 points, in which the most significant contributing charac-

teristics were the use of foam and cotton cushions (62.2%), in addition to regional anesthetics 31 (68.9%), general anesthetics 9 (20.0%), or both 3 (6;7%), as shown in table 2.

For the other items, the patients with the most grave characteristics were: 13 (28.9%) in lithotomic position and 2 (4.4%) in prone position; 11 (24.4%) were submitted to surgeries that lasted from two to four hours and 2 (4.4%)

who underwent surgeries for four to six hours; 16 (35.6%) with knee elevations above 90° or lower limbs opened in more than 90°, in addition to 6 (13.3%) whose knee elevations were less than 90° and whose lower limbs were opened in less than 90° or whose neck was not mentosternal aligned; comorbidities 16 (35.6%) and older ages 12 (26.7%) (Table 2).

Table 1 - Clinical characterization of the patients submitted to orthopedic, cardiac, gynecological and urological surgeries (n=45). Piauí, Brazil, 2017

Characteristic	M	SD	n	%
Surgical specialty				
Gynecology			25	55.6
Urology			8	17.8
Orthopedics			6	13.3
Cardiology			6	13.3
BMI	25.2	4.6		
Comorbidities				
Yes			16	35.6
Pre-operative surgical site related pain				
Yes	5.3	2.3	3	6.7
Pre-operative surgical site unrelated pain				
Yes	5.4	2.3	5	11.1
Pre-operative pressure lesion				
Yes			1	2.2
Previous pressure lesion				
Yes			3	6.7
Braden Scale Classification				
Elevated risk (10 to 12)			1	2.2
Moderate risk (13 to 14)			1	2.2
At risk (15-16, adult; 17-18, elder)			2	4.4
No risk (19 or higher)			41	91.1
Physical limitations				
Age-related and other limitations			5	11.1
Paresis			1	2.2
Paralysis			2	4.4
No limitation			37	82.2
Post-operative surgical site related pain				
Yes	3.5	0.7	2	4.4
Post-operative surgical site unrelated pain				
Yes	2.0	-	1	2.2
Total			45	100.0

Source: Santos, Oliveira⁽¹⁰⁾, 2017.

Caption: M: mean; SD: standard deviation

Table 2 - Risk of developing perioperative lesions resulting from surgical positioning of patients undergoing orthopedic, cardiac, gynecological and urological surgeries (n=45). Piauí, Brazil, 2017

ELPO items	Md	IQR	n	%
Surgical Position	1.0	4.0		
Supine			29	64.5
Lithotomic			13	28.9
Prone			2	4.4
Lateral			1	2.2
Surgery length	2.0	2.0		
Up to one hour			15	33.3
From one to two hours			17	37.9
From two to four hours			11	24.4
From four to six hours			2	4.4
Type of anesthetic	3.0	1.0		
Regional			31	68.9
General			9	20.0
General and regional			3	6.7
Local			1	2.2
Sedation			1	2.2
Support surface	4.0	3.0		
Foam and cotton cushions			28	62.2
Viscoelastic and viscoelastic cushions			16	35.6
Foam and viscoelastic cushions			1	2.2
Limb position	2.0	3.0		
Anatomic position			13	28.9
Lower limbs opened < 90°			10	22.2
Knees raised <90° and lower limbs opened <90° or neck with no mentosternal alignment.			6	13.3
Knees raised >90° or lower limbs opened >90°			16	35.6
Comorbidities	1.0	1.0		
No comorbidities			29	64.5
Vascular diseases			10	22.2
Diabetes Mellitus			5	11.1
PL or previously diagnosed neuropathy or DVT			1	2.2
Patient's age (in years)	2.0	1.0		
≥18 and ≤39			10	22.2
≥40 and ≤59			23	51.1
≥60 and ≤69			4	8.9
≥70 and ≤79			5	11.1
≥80			3	6.7
Total			45	100.0

Source: Santos, Oliveira⁽¹⁰⁾, 2017.

Caption: Md: Median; IQR: Interquartile range; ELPO: Scale for the Risk Assessment of Lesions Resulting from Surgical Positioning; PL: pressure lesion; DVT: deep vein thrombosis

Table 3 - Associations between the risk of developing lesions resulting from surgical positioning and the characteristics of patients undergoing orthopedic, cardiac, gynecological and urological surgeries (n=45). Piauí, Brazil, 2017

Characteristic	ELPO classification				p
	Highest risk		Lowest risk		
	n	%	n	%	
Gender					0.469 ^b
Female	12	26.7	23	51.1	
Male	2	4.4	8	17.8	
Age (years)					0.013^a
≤46	3	6.7	19	42.2	
≥46	11	24.4	12	26.7	
Profession					0.343 ^b
Retired/working	10	22.2	17	37.8	
Unemployed/household worker	4	8.9	14	31.1	
Origin					0.763 ^a
Teresina (urban and rural)	7	15.6	17	37.8	
Other municipalities in Piauí	7	15.6	14	31.1	
Surgical specialty					0.525 ^b
Gynecology	9	20.0	16	35.6	
Urology, orthopedics or cardiology	5	11.1	15	33.3	
BMI					0.520 ^b
24 or higher	6	13.3	18	40.0	
Lower than 24	8	17.8	13	28.9	
Systemic arterial hypertension					0.039^b
Yes	8	17.8	8	17.8	
No	6	13.3	23	51.1	
SSRP in the preoperative stage					1.000 ^b
Yes	1	2.2	2	4.4	
No	13	28.9	29	64.4	
SSUP in the preoperative stage					0.166 ^b
Yes	3	6.7	2	4.4	
No	11	24.4	29	64.4	
Pre-operative pressure lesion					0.311 ^b
Yes	1	2.2	0	0.0	
No	13	28.9	31	68.9	
Previous pressure lesion					0.224 ^b
Yes	2	4.4	1	2.2	
No	12	26.7	30	66.7	
Braden Classification					0.578 ^b
Some risk	2	4.4	2	4.4	
No risk	12	26.7	29	64.4	

Physical limitations					0.231 ^b
Some limitations	4	8.9	4	8.9	
No limitation	10	22.2	27	60.0	
SSRP					0.530 ^b
Yes	1	2.2	1	2.2	
No	13	28.9	30	66.7	
SSUP					0.311 ^b
Yes	1	2.2	0	0.0	
No	13	28.9	31	68.9	
Total	14	31.1	31	68.9	

Source: Santos, Oliveira⁽¹⁰⁾, 2017.

Caption: ELPO: Scale for the Risk Assessment of Lesions Resulting from Surgical Positioning; SSRP: surgical-site related pain; SSUP: surgical-site unrelated pain; p: association significance; a: Chi-Square Pearson's test; b: Fisher's Exact Test.

Statistically significant associations were found between the risk for the development of lesions resulting from surgical positioning and age ($p=0.013$) and systemic arterial hypertension ($p=0.039$). 46-year-old or older patients were 3.5 times more prevalent in higher risk classifications than those who were younger than 46 years old; and those who presented systemic arterial hypertension had a 2.7 times greater prevalence (IC95%=1.131 - 6.290) of higher risk classifications when compared to those who did not have this problem.

■ DISCUSSION

In the hospital where the study was developed, 68.9% of the patients who had undergone elective surgeries in the specialties researched were under reduced risk, according to the ELPO, with a mean score of 16.9, a minimum of 9.0 and a maximum of 25.0.

The most commonly related position in this study is regarding dorsal decubitus, whose prevalence was 64.5%. It is the natural position of the body when resting, allowing the professionals to set the back of the client and their vertebral column on the surface of the surgical bed, making it easier to reach thoracic and abdominal regions, as well as upper and lower limbs. Despite that, this position offers the risk of many muscular and nervous lesions due to compression and elongation⁽¹³⁻¹⁵⁾.

The support surfaces set on the bed and made with foam or gel are considered less effective to protect the skin, while those whose surfaces are made of viscoelastic polymers and dynamic air cushions or micropulsing systems work well to alleviate the pressure, and are effective in the protection of the perioperative period⁽¹³⁾. Although it is not understood as an ideal situation, one of the strategies

used during surgery to replace the surfaces of the cushions made of foam and viscoelastic was the use of cotton cushions in 62.2% of cases, as a tool to continue offering health care and promoting safety more effectively than would be the case if the patient was set on the table with no support to decrease pressure.

Therefore, positioning strategies using support and rest surfaces promote higher safety and contribute to preserve the integrity of the skin and reduce the impact of nervous, articular and muscular pressure⁽¹³⁾.

Most patients were female, employed, and came from the capital of the state. The female gender had the highest prevalence, since it represents a majority in the profile of the population and in the sample, in addition to having a higher knowledge about their own health and being more worried about it, which leads them to seek health services more frequently and to more notifications⁽¹⁶⁻¹⁷⁾.

It was possible to find that 37.77% of patients had comorbidities. From these, only 37.5% had systemic arterial hypertension, since in a universe of 17 patients with comorbidities, 16 had hypertension and the other pathologies were associated to it, being diabetes mellitus the second most common with 25%, followed by heart diseases with 12.5%, and the associations between them with 6.25% each, which are: hypertension with vascular diseases, hypertension with vascular diseases and pressure lesions, and hypertension with vascular diseases and heart diseases. Studies have shown a prevalence of arterial hypertension which is higher among women from all age groups. In another study, arterial hypertension had a prevalence of 16.3% in adults younger than 59 years of age, and the chance for hypertension increased in 10% for each year of life^(16,18).

Indicated as one of the most prevalent morbidities, especially with the change in the clinical and sociodemo-

graphic profile in Brazil, the arterial hypertension may affect the sensory capabilities, diminishing blood flow and, consequently, oxygenation, increasing the likelihood of pressure lesions. In addition, a retrospective review with more than 380,000 cases showed a significant relation between hypertension and intra-surgery neuropathy, with an incidence of 345 from all cases with lesions⁽¹⁹⁾.

The second most common, with a 25% incidence in this study, were the cases of patients with diabetes mellitus, reported in similar studies as being 24 times more likely to develop nervous lesions during the surgical procedure, since this morbidity generates a reduction of the potential of action of the sensorial nerve and of the speed of conduction of the potential of action of the muscle, when under light ischemic stress^(17,19).

The mean age of the participants who underwent elective surgeries in the research was 50.9 years of age. Such data corroborate the findings of other studies regarding skin integrity, since the incidence of lesions in elderly patients is attributed to physiological changes in the structure of the skin, such as the diminution of its elasticity, blood flow and nutrition, as well as the processes of cellular reposition and healing, which makes the skin more frail and susceptible to interruptions to its integrity⁽¹⁶⁾.

With higher life expectancies, elderly patients are increasingly more subject to surgeries of myocardium revascularization, demanding more intensive care due to the risk of post-operative complications when associated to factors associated to advanced age, leading to an increased hospitalization time⁽¹⁷⁾.

Regarding the length of hospitalization, the research took place with a mean of 5.5 days of follow-up, and a discharge was the outcome for 84.4% of patients, while 15.6% had a longer hospitalization time than the length of data collection due to complications in their general health state, especially in the cases of cardiac surgeries.

Another complication very commonly addressed by specialists is pain, which is a factor indicative of complications and possible delays in the recovery process. In a study conducted with women in the pre-operative stage of gynecological surgeries, nearly one third reported interferences from moderate to severe in sleep, general activities, pleasure, mood and work, relating variables such as age, race, BMI, smoking, anxiety and depression, as being significantly related to the experience of pain⁽¹⁸⁾.

In this study, it was possible to find the incidences of 11.1% and 6.7% for pre-operative pain, respectively non-related and related to the surgical site. In the post-op the cases of pain unrelated to the surgical site fell to 2.2%, while in 4.4% of the cases there was pain in the site

of the surgery. The management of pain is more effective when interventions are not used precociously. Pre-operative Nursing interventions in health education about the surgical process, preoccupations and expectancies for the treatment, can make the situation easier, diminishing the length of exposure to pain, and optimizing the satisfaction of the patient by increasing the quality of the perioperative care^(18,20).

Studies indicate that lesions are more likely in the case of patients who undergo epidural anesthesia 68% than in that of patients who suffer general anesthetic induction 20%, which is in accordance with the findings of this study. Sedation and anesthesia nullify the ability to feel discomfort and change position during the surgical procedure, as they block the sensitivity of the body to pain and to pressure, leading to vasodilation and, consequently, to a reduction of arterial pressure and tissue perfusion. Therefore, abnormal amounts of pressure in certain areas of the body may lead to ruptures in the ischemic tissue and to the development of pressure lesions^(8,14).

The use of the Braden Scale made it possible to classify 8.9% of the participants as part of the risk group for the development of pressure lesions, and 2.2% of them developed PL in the pre-operative stage, which reoccurred in 6.7% of them with a history of lesion. In addition, 17.8% had some type of physical limitation. In 11.1% of cases it was related to alterations inherent to age, and in two paralysis cases it was the sequela of ischemic strokes and due to firearm injury.

A total of 24.4% of patients went through the surgical procedures for two to four hours, while only 4.4% went through a longer period, from four to six hours, not remaining on the operating table long enough for the integrity of the skin and muscles to be damaged. In other studies, the constant pressure to which the tissues have been exposed for a period of two to three hours can cause pressure lesions and focal alopecia, which risks evolving to more critical stages according to the characteristics of the tissues involved, meaning that risk evaluation is important to better plan the health assistance^(11,15).

■ CONCLUSION

It is possible to state that the objectives of this study were met as it was possible to evaluate the risk of developing perioperative lesions resulting from positioning. 31.1% of participants were evaluated as at a high risk. Ages above 46 years old and systemic arterial hypertension diagnostics were associated to higher risks of surgical lesions due to positioning.

The limitations of this study consisted in the length of data collection, which was smaller than the planned length from the pre-operative interview to the moment of the discharge of the patients, in addition to delays and cancelled surgeries due to administrative issues. Additionally, it was not possible to identify lesions that resulted from surgical positioning, since only one participant presented a pressure lesion that was there before the surgery.

The experience in the development of this study was an important stage in the exploration of knowledge and the enriching of the practice of nursing, since it was possible to discuss and interact with the health care team and strengthen the bond between research and teaching, offering an important subsidy to plan perioperative care.

More robust researches are encouraged, that can evaluate the risk of developing perioperative lesions, as well as propose interventions aimed at promoting the safety of surgery patients.

■ REFERENCES

1. Santos ML, Novaes CO, Iglesias AC. [Epidemiological profile of patients seen in the pre-anesthetic assessment clinic of a university hospital]. *Rev Bras Anesthesiol.* 2017;67(5):457-67. Portuguese. doi: <https://doi.org/10.1016/j.bjan.2016.06.002>.
2. Ministério da Saúde (BR). Procedimentos hospitalares do SUS: por local de internação: Brasil [Internet]. Brasília (DF): Datasus; 2014 [cited 2017 Mar 28]. Available from: <http://tabnet.datasus.gov.br/cgi/tabcgi.exe?sih/cnv/qjuif.def>.
3. MacDonald JJ, Washington SJ. Positioning the surgical patient. *Anaesth Intensive Care Med.* 2012;13(11):528-32. doi: <https://doi.org/10.1016/j.mpaic.2012.09.002>.
4. Sprice L, Van Wicklin SA. Back to basics: positioning the patient. *AORN J.* 2014;100(3):298-305. doi: <https://doi.org/10.1016/j.aorn.2014.06.004>.
5. Sorensen EE, Kusk KH, Gronkjaer M. Operating room nurses' positioning of anesthetized surgical patients. *J Clin Nurs.* 2015;25(5-6):690-8. doi: <https://doi.org/10.1111/jocn.13000>.
6. Sutton S, Link T, Makic MBF. A quality improvement Project for safe and effective patient positioning during robot-assisted surgery. *AORN J.* 2013;97(4):448-56. doi: <https://doi.org/10.1016/j.aorn.2013.01.014>.
7. Sukhu T, Krupski TL. Patient Positioning and prevention of injuries in patients undergoing laparoscopic and robot-assisted urologic procedures. *Curr Urol Rep.* 2014;15:398. doi: <https://doi.org/10.1007/s11934-014-0398-1>.
8. Menezes S, Rodrigues R, Tranquada R, Muller S, Gama K, Manso T. Lesões decorrentes do posicionamento para cirurgia: incidência e fatores de risco. *Acta Med Port.* 2013 [cited 2017 Jun 10];26(1):12-6. Available from: <https://www.actamedicaportuguesa.com/revista/index.php/amp/article/view/4006/3204>.
9. Lilitis E, Papaioannou A, Hatzimichali A, Spyridakis K, Xenaki S, Chalkiadakis G, et al. A case of asystole from carotid sinus hypersensitivity during patient positioning for thyroidectomy. *BMC Anesthesiol.* 2016;16:85. doi: <https://doi.org/10.1186/s12871-016-0255-5>.
10. Santos AMJF, Oliveira HMBS. Avaliação do risco para o desenvolvimento de lesões perioperatórias decorrentes do posicionamento cirúrgico [monografia]. Teresina (PI): Universidade Federal do Piauí; 2017.
11. Lopes CMM, Haas VJ, Dantas RAS, Oliveira CG, Galvão CM. Assessment scale of risk for surgical positioning injuries. *Rev Latino-Am Enfermagem.* 2016;24:e2704. doi: <https://doi.org/10.1590/1518-8345.0644.2704>.
12. Ministério da Saúde (BR). Conselho Nacional de Saúde. Resolução nº 466, de 12 de dezembro de 2012. Diretrizes e normas regulamentadoras de pesquisas envolvendo seres humanos. *Diário Oficial da União [da] República Federativa do Brasil.* 2013 jun 13;150(112 Seção 1):59-62.
13. Bentlin AC, Grigoletto ARL, Avelar MCQ, Sundfeld MCK. [Skin lesions resulting from surgical positioning in elderly]. *Rev SOBECC.* 2012 [cited 2017 May 14];17(2):56-63. Portuguese. Available from: http://www.sobecc.org.br/arquivos/artigos/2012/pdf/revista/abril_junho/lesoes.pdf.
14. Nilsson UG. Intraoperative positioning of patients under general anesthesia and the risk of postoperative pain and pressure ulcers. *J Perianesth Nurs.* 2013;28(3):137-43. doi: <https://doi.org/10.1016/j.jopan.2012.09.006>.
15. Xavier T, Silva MF, Frias FFP. Postoperative visit as a strategy for assessment of nursing care quality in intraoperative. *J Res Fundam Care Online.* 2013;6(3):1139-51. doi: <https://doi.org/10.9789/2175-5361.2014v6n3p1139>.
16. Colósimo FC, Sousa AG, Silva GS, Piotto RF, Pierin AMG. Arterial hypertension and associated factors in patients submitted to myocardial revascularization. *Rev Esc Enferm USP.* 2015;49(2):201-8. doi: <https://doi.org/10.1590/S0080-623420150000200003>.
17. Gimenes C, Barrile SR, Martinelli B, Ronchi CF, Arca EA, Gimenes R, et al. Association of pre and intraoperative variables with postoperative complications in coronary artery by-pass graft surgery. *Rev Bras Cir Cardiovasc.* 2013;28(4):518-23. doi: <https://doi.org/10.5935/1678-9741.20130084>.
18. Walker S, Hopman WM, Carley ME, Mann EG, Vandenkerkhof EG. Healthcare use for pain in women waiting for gynaecological surgery. 2016; Article ID 1343568. doi: <https://doi.org/10.1155/2016/1343568>.
19. La Neve JE, Zitney FP. Use of Somatosensory Evoked Potentials to detect and prevent impending brachial plexus injury during surgical positioning for the treatment of supratentorial pathologies. *Neurodiagn J.* 2014;54(3):260-73.
20. Malley A, Young GJ. A qualitative study of patient and provider experiences during perioperative care transitions. *J Clin Nurs.* 2017;26(13-14):2016-24. doi: <https://doi.org/10.1111/jocn.13610>.

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Received: 05.20.2018

Approved: 11.16.2018