

THIRST OF THE ORTHOPEDIC SURGICAL PATIENT IN THE IMMEDIATE POSTOPERATIVE

SEDE DO PACIENTE CIRÚRGICO ORTOPÉDICO NO PÓS-OPERATÓRIO IMEDIATO

SED DEL PACIENTE QUIRÚRGICO ORTOPÉDICO EN EL POSTOPERATORIO INMEDIATO

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Objective: to assess the prevalence, intensity and discomfort of the thirst of the orthopedic surgical patient and the correlations with the demographic and clinical-surgical variables. **Method:** cross-sectional, quantitative and analytical study with 78 patients in the Post-Anesthetic Recovery Room of a teaching hospital. **Results:** eight patients (10.3%) reported thirst spontaneously. Its mean intensity was 4.8, and the discomfort, 5.0. The attribute dry mouth was the most prevalent, followed by desire to drink water and dried lips. Intensity correlated significantly with discomfort of thirst in the group of patients from 21 to 40 years. There was a relationship of prevalence between presence of thirst and all the attributes of the Perioperative Thirst Discomfort Scale, with the exception of the attribute bad taste in the mouth. **Conclusion:** the thirst of the orthopedic surgical patient is prevalent in the postoperative period, with moderate intensity, but considerably uncomfortable.

Descriptors: Thirst. Perioperative Nursing. Orthopedics. Recovery Room.

Objetivo: verificar a prevalência, intensidade e desconforto da sede do paciente cirúrgico ortopédico e as correlações com as variáveis demográficas e clínico-cirúrgicas. *Método:* estudo transversal, quantitativo e analítico com 78 pacientes em Sala de Recuperação Pós-Anestésica de um hospital de ensino. *Resultados:* oito pacientes (10,3%) verbalizaram sede espontaneamente. Sua intensidade média foi de 4,8 e o desconforto de 5,0. O atributo boca seca foi o mais prevalente, seguido de vontade de beber água e lábios ressecados. Intensidade associou-se significativamente a desconforto da sede no grupo de pacientes de 21 a 40 anos. Houve relação de prevalência entre presença de sede e todos os atributos da Escala de Desconforto da Sede Perioperatória, com exceção do atributo gosto ruim na boca. *Conclusão:* a sede do paciente cirúrgico ortopédico é prevalente no período pós-operatório, de intensidade moderada, porém consideravelmente desconfortável.

Descritores: Sede. Enfermagem Perioperatória. Ortopedia. Sala de Recuperação.

Objetivo: evaluar la prevalencia, la intensidad y la incomodidad de la sed del paciente ortopédico quirúrgico y las correlaciones con las variables demográficas y clínico-quirúrgicas. *Método:* estudio transversal, cuantitativo y analítico con 78 pacientes en la Sala de Recuperación Post-Anestésica de un hospital universitario. *Resultados:* ocho pacientes (10,3%) reportaron sed espontáneamente. Su intensidad media fue de 4,8 y la incomodidad, 5,0. El

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atributo boca seca fue el más frecuente, seguido por la voluntad de beber agua y labios secos. Intensidad correlacionó significativamente al malestar de la sed en el grupo de pacientes de 21 a 40 años. Hubo una relación de prevalencia entre la presencia de la sed y todos los atributos de la Escala de Incomodidad de la Sed Perioperatoria, con la excepción del atributo mal sabor en la boca. Conclusión: la sede del paciente ortopédico quirúrgico es frecuente en el postoperatorio, de intensidad moderada, pero muy incómodo.

Descriptores: Sed. Enfermería Perioperatoria. Ortopedia. Sala de Recuperación.

Introduction

The surgical procedure is a form of therapy used by the medicine to treat several pathophysiological disorders. However, it may involve real threats, such as risk of life, loss of organs or their parts, changes in routine, distancing from family and professional commitments, financial losses, besides the discomfort due to the surgical intervention itself⁽¹⁻²⁾.

Among the physical preparations of the patient in the preoperative period, there stands out the fasting, which causes hunger, anxiety, hormonal effects and, particularly, is one of the predisposing factors of thirst. Other conditions can also intensify the thirst in the perioperative period, such as tracheal intubation, use of opioid and anticholinergics and emotional factors⁽³⁾.

The orthopedic surgical procedures represent a large percentage of surgical schedules of various hospital institutions. A reference institution for orthopedics and traumatology carried out, in 2016, 7,285 surgical procedures, of which 1,466 (17.8%) were orthopedic, totaling an average of 123 orthopedic surgeries per month. On the other hand, what stands out is the high rate of surgical suspension of that clinic, around 26% in 2013, being the second specialty with the greatest number of suspensions⁽⁴⁾. This event has contributed to the prolongation of hospitalization and the repetition of preoperative preparations.

The orthopedic surgical patient presents peculiarities that contribute to a state of great discomfort and anxiety, such as impaired mobility and increased risk for the development of infections, which may be related to the implementation of multiple procedures and the use of orthoses and prostheses, which prevent or

hinder their mobilization⁽⁵⁾, in addition to pain, which is very prevalent in this group of patients⁽⁶⁾.

In this way, the relationship between anxiety and thirst stands out. Emotional factors may be responsible for the decreased salivary production, causing a sensation of dry mouth⁽⁷⁾, one of the most prevalent attributes among surgical patients in the immediate postoperative period (IPOP), reaching 87.3%⁽⁸⁾.

The triggering of the thirst in the orthopedic surgical patient may also arise from the use of drugs of the opiates class, used to control postoperative pain⁽⁶⁾. As well as the anticholinergic drugs, opioids cause a reduction in the salivary production as an adverse effect, causing, as a consequence, the dryness of the oral cavity⁽⁹⁾.

The objective of this article is to verify the prevalence, intensity and discomfort of the thirst of the orthopedic surgical patient and the correlations with the demographic and clinical-surgical variables.

Method

This was a cross-sectional study of quantitative and analytical approach, which allows describing the situation and the relations between the phenomena of interest at a time⁽¹⁰⁾.

This research was carried out in the Anesthetic Recovery Room (ARR) of the Surgical Center of a university hospital in Southern Brazil. This is a public teaching hospital with 316 beds and exclusive service for the Unified Health System (SUS), municipal and state reference in cases of high complexity and traumatology.

The study population was composed of patients in the IPOP for orthopedic surgeries. The non-probabilistic sample was composed of patients undergoing orthopedic surgeries between November 2016 and March 2017. The sample included patients who met the following criteria: age greater than or equal to 12 years, fasting for 2 hours or more, permanence in the ARR or Operating Room (OR) after the completion of the surgical procedure, being conscious and oriented in time and space. Those with hearing or communication difficulty were excluded.

Data collection used a research guide with demographic and clinical data. The collection occurred in the ARR and, for patients recovering in the surgical room, for precaution of contact or to wait for admission in the Intensive Care Unit (ICU), the collection occurred in the OR.

The intensity of the thirst was measured through the Numeric Visual Scale (NVS), which consists of a unidimensional instrument with 10-point graduation (0-10), in which zero means no thirst and 10, the worst thirst ever felt⁽⁹⁾. The discomfort of the thirst was measured through the Perioperative Thirst Discomfort Scale (PTDS), with content validation and reliability of 100% for all items, which evaluates seven attributes of the thirst: dry mouth, dry lips, white tongue, thick saliva, dry throat, bad taste in the mouth and desire to drink water. Its graduation varies from 0 to 14, where 0 means no discomfort and 14, extremely uncomfortable⁽¹¹⁾.

Database construction used Excel 2014®. The data were inserted by dual typing, followed by validation to correct possible errors in the introduction of the information, with subsequent export to the IBM program SPSS version 20.0. First, the variables were analyzed descriptively through absolute and relative frequencies. For the correlation analyses, the following variables were considered predictors: gender, age, time of fasting of liquids and solids, ASA, length of anesthesia, intubation, use of opioid, procedure length, intensity of the thirst and the PTDS attributes. For the correlation analysis of the predictive variables with the intensity and the postoperative thirst discomfort, the

Spearman's correlation coefficient was used. For the correlation between presence of thirst and predictor variables, the Pearson correlation coefficient (r) was used, with a confidence interval of 95%.

The research was approved by the Research Ethics Committee, CAAE 29069414.5.0000.5231, and complied with the ethical principles of Resolution n. 466 of November 2012, of the National Health Council. All participants, after guidelines and clarifications about the study, signed an Informed Consent Form (ICF). Those responsible for patients underage signed the Informed Assent Form (IAF).

Results

During the study period, 558 orthopedic surgical procedures were performed, totaling the care with 488 patients, of whom 248 (50.8%) were elective surgeries. Of all the procedures, 247 (44.3%) were elective and 311 (55.7%), urgency/emergency. The difference between the numbers of procedures and patients was due to the fact of the completion of more than one surgical procedure in the same individual.

This study sample consisted of 78 patients, being the majority males (74.4%), aged between 12 and 85 years (μ 42.8 \pm SD 20.2). Of those 78 patients, 62 presented thirst. The liquid fasting length ranged between 3.8 and 23.9 hours (μ 14.0 \pm SD 3.9); the solid fasting length ranged between 9.0 and 24.3 hours (μ 15.5 \pm 3.6).

Regarding the surgical suspension, 23 patients (29.5%) had the surgical procedure canceled at least once: for 18 of them (23.1%), suspension of one surgical procedure, for 4 (5.1%), the suspension of two, and 1 patient (1.3%) had three surgical suspensions. In relation to the surgical suspensions, according to the institution's own classification, among 11 causes of suspension verified in this study, 5 (45.4%) related to the team's request. Ten suspensions related to delay in the previous surgery (31.3%); eight, due to the surgeon's refusal (25.0%); four, due to the urgency/emergency care (12.5%); and three, due to the surgical planning for the wrong day

(9.4%). The reasons inappropriate preparation by the physician, inappropriate preparation by the patient, lack of beds in the ICU, duplication of scheduling, patients without clinical conditions, rescheduling by the clinic and surgeon's absence were reported once, representing 3.1% each.

In relation to the classification of the patient's preoperative physical condition, according to the American Society of Anesthesiologists⁽¹²⁾, most patients were classified as ASA I (44.9%), healthy, and ASA II (47.4%) patients with mild to moderate systemic disease, without functional limitation. The others were classified as ASA III (5.1%), patient with severe systemic disease with functional limitation; and ASA IV (1.3%) patient with severe systemic disease that is a constant threat to life. One patient was not classified by the ASA scale, for having been subjected to local anesthesia for the surgical procedure.

Spinal and epidural blocks were used in most procedures (55.1%), followed by the block of upper limbs (19.2%) and general anesthesia (11.5%). Only three patients (3.8%) were submitted to sedation, and eight (10.3%) had associations of anesthesia: general, general

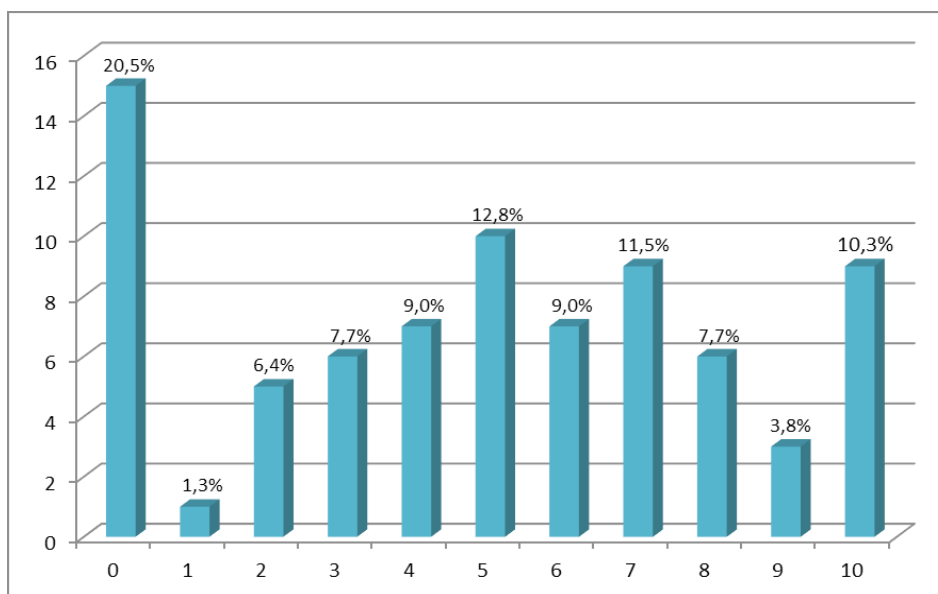
anesthesia with epidural block, block of upper limbs with general anesthesia, sedation and spinal block and another underwent only local anesthesia.

Most patients (83.3%) were not intubated in the intraoperative period. In relation to the use of opioids, fentanyl was used in 25 patients (32.1%), morphine in 13 (16.7%), and 32 (41.0%) received the association of these two opioid. In 6 patients (7.7%), other opiates or other combinations of these medications were used: alfentanil, sufentanil associated with fentanyl, alfentanil combined with fentanyl. In 2 patients (2.6%), no opiates were used.

Surgical procedures were performed predominantly in the lower limbs (65.4%), followed by upper limb (29.5%) and spine (5.1%) surgeries.

In relation to the spontaneous verbalization of thirst, eight patients (10.3%) reported being thirsty. Among the patients who did not report thirst spontaneously (89.7%), after questioned by the researchers, 54 (77.1%) verbally expressed being thirsty. The mean thirst intensity in the IPOP was 4.8 (\pm SD 0.7) (Graph 1).

Graph 1 – Distribution of the percentage of thirst intensity according to the Visual Numeric Scale by number of patients. Londrina, Paraná, Brazil – 2017

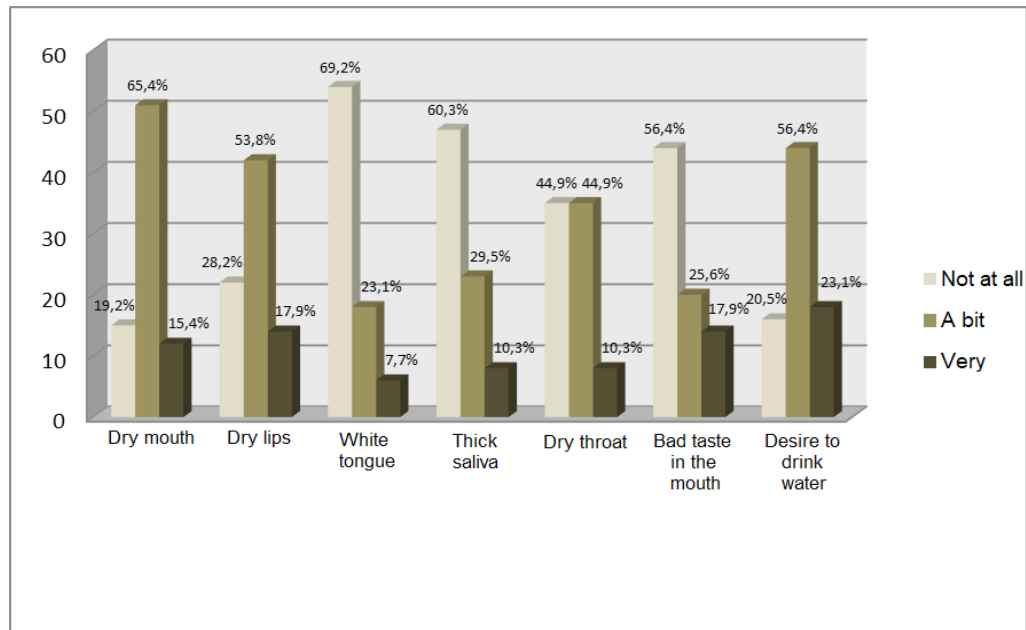


Source: Created by the authors

The mean score of discomfort measured by the PTDS was 5.0 (\pm SD 3.4). The analysis of the prevalence of the scale attributes separately showed that the attribute dry mouth presented the highest prevalence (80.8%), followed by desire to drink water (79.5%) and dry lips

(71.7%). Nevertheless, concerning the graduation of attributes (nothing, a bit and very), desire to drink water presented higher prevalence of very uncomfortable (23.1%), followed by dry lips (17.9%), bad taste in the mouth (17.9%) and dry mouth (15.4%) (Graph 2).

Graph 2 – Distribution of the percentage of attributes of thirst discomfort by number of patients. Londrina, Paraná, Brazil – 2017



Source: Created by the authors.

There was no significant association in the bivariate analysis between independent variables (age, liquid fasting length, solid fasting length, anesthesia length, procedure length) and dependent variables (thirst intensity and discomfort). Nonetheless,

the thirst intensity in the IPOP presented significant association ($p=0.000$) with thirst discomfort, that is, the higher the thirst intensity referred by the patient, the greater the perioperative thirst discomfort indicated by PTDS (Table 1).

Table 1 – Correlations of the predictor variables with the Visual Numeric Scale scores in patients undergoing orthopedic surgery in the immediate postoperative. Londrina, Paraná, Brazil – 2017

Variables	Thirst Discomfort		Thirst Discomfort	
	r*	p-value	r*	p-value
Age	-0.098	0.392	- 0.045	0.695
Liquid fasting length	0.058	0.617	0.006	0.960
Solid fasting length	0.073	0.525	0.130	0.258
Anesthesia length	-0.131	0.251	-0.201	0.078
Procedure length	0.076	0.508	-0.078	0.497
Thirst intensity	0.633	0.000	1.00	-

Source: Created by the authors.

* r - Spearman's correlation coefficient.

The factors associated with the presence of thirst were: age between 21 and 40 years, dry mouth, dry lips, white tongue, thick saliva and dry throat. The variables sex, age up to 20 years

and 41 years or more, ASA, intubation and use of opioid and the attribute bad taste in the mouth showed no significant prevalence ratio (Table 2).

Table 2 – Distribution of demographic and clinical variables according to the presence of thirst in patients undergoing orthopedic surgery in the immediate postoperative. Londrina, Paraná, Brazil – 2017

Variables	Presence of Thirst			
	n (%)	Prevalence Ratio	Confidence Interval	p-value
Sex				
Female	17 (85.0)	1.09	0.87 - 1.38	0.437
Male	45 (77.6)	1.00		
Age				
Up to 20 years	11 (73.3)	1.02	0.71 - 1.47	0.909
21 - 40 years	23 (95.8)	1.33	1.08 - 1.65	0.008
41 years or more	28 (71.8)	1.00		
ASA				
I	30 (85.7)	1.00		
II	32 (76.2)	0.89	0.72 - 1.10	0.286
Intubation				
Yes	9 (69.2)	0.85	0.580 - 1.24	0.399
No	53 (81.5)	1.00		
Use of opioid				
Yes	61 (80.3)	1.60	0.40 - 6.44	0.505
No	1 (50.0)	1.00		
Dry Mouth				
Yes	55 (87.3)	1.87	1.08 - 3.24	0.025
No	7 (46.7)	1.00		
Dry Lips				
Yes	49 (87.5)	1.48	1.03 - 2.13	0.033
No	13 (59.1)	1.00		
Whit Tongue				
Yes	23 (95.8)	1.33	1.10 - 1.60	0.003
No	39 (72.2)	1.00		
Thick Saliva				
Yes	29 (93.5)	1.33	1.08 - 1.64	0.007
No	33 (70.2)	1.00		
Dry Throat				
Yes	38 (88.4)	1.29	1.01 - 1.65	0.046
No	24 (68.6)	1.00		

Source: Created by the authors.

* The bad taste in the mouth attribute had no prevalence ratio.

Discussion

An unusual, unknown event often creates feelings of fear and anxiety⁽²⁾. Based on this

assumption, a surgery can intensify these negative feelings, when considering the possible implications of a surgical procedure in the patient's everyday life, since the distancing from

family and professional commitments until a real threat to his/her life⁽¹⁾. A surgery involves a series of preoperative care for its implementation, such as fasting, which, in turn, can cause, among other symptoms and discomforts, the thirst.

Studies have shown that thirst is a highly prevalent and intense symptom^(8,13), however, is still relatively unexplored in the literature, especially when related to pre and postoperative surgical patients^(3,7). The scenario presents an even worse interface, when analyzing the thirst and its correlations in specific groups. This study contributes to the analysis of the prevalence of thirst and its discomforts in a group of surgical patients with characteristics that are important for the development of perioperative thirst.

The relevance of searching the thirst symptom in this specific group is due to the peculiarities of those patients in the study institution, in this case, a teaching hospital with medical residency in orthopedics and traumatology, being a reference for trauma. Such characteristics may contribute to a service profile with weaknesses due to high demand. Among them, long periods of waiting for the completion of the procedure, prolonged hospitalization, high rates of surgical suspension and, consequently, repeated and prolonged periods of preoperative fasting.

This study revealed that the orthopedic surgical procedures were carried out predominantly in young male individuals. Although the reason for the completion of the surgical procedure was not investigated, the characteristics lead to believe it relates to external causes, more specifically to traffic accidents. In the city where the study was conducted, the number of traffic accidents, between 1999 and 2008, increased by 74.2%, and male individuals represented more than 70% of the victims. Furthermore, 60% of the people involved in those accidents were between 15 and 34 years⁽¹⁴⁾. The demographic data of this research are similar to those of another study, in which the male represents more than 70% of individuals involved in traffic accidents⁽¹⁵⁾.

The recommendation of fasting time is 2 hours to clear liquids and 6 hours for a

light diet⁽¹²⁾, but the time of preoperative fasting verified in this study was much higher, with an average of 14 hours for liquids and 15.5 hours for solids, resembling the results obtained by other researchers^(8,13). In another study conducted in the same institution of this research, the maximum time of fasting found was 37 hours⁽¹⁵⁾. Those findings demonstrate that the protocols of preoperative preparation are not performed, which can intensify the discomforts resulting from fasting - such as the thirst - and, in particular, influence the postoperative recovery, causing the potentiation of the organic response to surgical trauma⁽¹⁶⁾.

Most patients were classified as ASA I and ASA II, that is, were healthy individuals or with mild systemic diseases, without limitations⁽¹²⁾. This characteristic may be related to the predominance of young individuals submitted to surgical procedure due to trauma from traffic accidents.

In relation to the anesthetic technique, spinal/epidural and block of upper limbs were the most frequent. Patients victims of traffic accidents suffer injuries mainly in limbs⁽¹⁷⁾. In this study, the surgical procedures were performed especially in lower limbs, thus the predominance of spinal/epidural.

The thirst is a common symptom among surgical patients, but little verbalized by most individuals⁽³⁾. In this study, the spontaneous verbalization of thirst was 10.3%. Nevertheless, after questioning the patients, this number increased significantly (77.1%). Therefore, despite the high prevalence of symptom, few patients verbally express it to health professionals. This can be linked to a culture in which feeling thirst is a price to pay for a safe anesthetic-surgical procedure, preventing intra and postoperative complications⁽¹⁸⁾.

That silence is believed to be related to the fear of talking about the real feeling about the discomfort. The silence of the surgical patient does not mean not being thirsty; it only depicts the fragmented interaction and communication between patient and professional. The health professional usually questions about presence of

pain, disregarding prevalent discomforts such as the thirst⁽¹³⁾.

In a study in which the patient attributed fictitious monetary values to the prevention of postoperative discomfort, the thirst was the second discomfort with greater monetary award, standing out as the second discomfort by which patients were willing to pay more in order not to experience it⁽¹⁹⁾. The surgical patient considers the thirst extremely uncomfortable and stressor, but remains silent for believing that nothing can be done to relieve his/her thirst. At the same time, the silence of the surgical patient regarding the presence and the discomfort of thirst causes the intensification of the symptom⁽¹⁸⁾, generating greater suffering and anguish.

In the present study, some individuals presented difficulty graduating the intensity of the thirst they felt. As well as the pain, thirst is a subjective symptom, which may vary from one individual to another in a similar situation⁽³⁾. This variation of the perception of the thirst may be related to physiological factors - such as the difference in the ability of different organisms detect altered plasma osmolality - and, most importantly, to personal habits issues^(7-8,20).

The thirst can be defined as the desire to drink water, but the water ingestion can be linked to other factors, such as rituals, habits and desire for other substances⁽²⁰⁾. Therefore, the thirst is a sensation that can be learned or conditioned to a process that can be perceived by signs and symptoms represented by the body, such as dry mouth and throat⁽¹¹⁾. Corroborating other studies, this study found that the thirst, in addition to being a symptom of high prevalence, also has high intensity^(8,13).

Considering the fact that the thirst has multifactorial cause and can be intensified by factors associated with hospitalization and surgical procedure, it is relevant not only to measure its intensity, but also consider the complexity of signs⁽¹¹⁾. The thirst can be identified by other means, such as increased osmolality, reduced blood pressure and blood volume, increased concentration of angiotensin II⁽⁷⁾. It also features attributes indicative of dryness of the mucosa

that lead to changes in the antidiuretic hormone (ADH) and perception of the thirst⁽²¹⁾.

Regarding the PTDS attributes, all were mentioned by patients in this study, resembling the results of a study in which dry mouth and desire to drink water were also the items of higher prevalence (87.3%)⁽⁸⁾. In other studies, those attributes appear as signs and symptoms resulting from thirst⁽²⁰⁾, observed both by professionals as by the patients themselves and their families⁽²²⁾.

The final PTDS score, in this study, presented middle discomfort lower than the result of another research⁽⁸⁾. Even when resulting in discomfort of moderate intensity, the symptom is real, cannot be ignored, nor fail to receive relief strategies.

Regarding surgical suspension, as in other studies, this study found a high rate of cancellation in the orthopedic specialty^(4,23). Furthermore, the main reasons for surgical suspension are not related to patients' clinical factors. In another study, the cancellation requested by the surgeon represented 17.93% of the suspensions⁽²⁴⁾. The cancellation of surgery, in addition to generating financial losses to the institution, affects in particular the patient, who undergoes surgical preparation repeatedly, with times of extreme fasting, which may intensify the discomfort of thirst.

Similarly to other studies^(3,8), despite the high length of preoperative fasting, there was no significant association between this variable and thirst intensity and discomfort. There is need to research the correlation of those variables in stratified groups and with smaller fasting length, which could identify the significant correlation between fasting length, thirst intensity and discomfort in a population with similar demographic characteristics.

Concerning the length of anesthesia and procedure, there was no significant association between thirst intensity and discomfort. In this sense, one believes the hypothesis that some factors might influence the results, such as non-thorough measurement of infusion of liquids and lack of control of intraoperative bleeding.

There was a significant prevalence ratio between age range from 21 to 40 years and presence of thirst. This ratio between age and presence of thirst must be better investigated, with studies that provide sample stratification, allowing observing and relating the behavior of different age groups with the other variables in a multifactorial model.

As for the lack of significant prevalence ratio with the use of opioid, it is believed that the dose-dependency can influence the presence and intensity of thirst, which need to be better investigated⁽⁹⁾.

It was possible to observe a prevalence ratio with presence of thirst among patients who reported dry mouth, dry lips, white tongue, thick saliva and dry throat. Moreover, there was a correlation between discomfort and intensity, that is, the greater the discomfort of perioperative thirst, the greater the intensity of the symptom, a result similar to that of another study⁽⁸⁾.

Due to the high prevalence of thirst, one highlights the importance of exploring this symptom through its identification, measurement and treatment. The literature provides bases for use in health professionals' practice, such as the Safety Protocol for the Thirst Management (PSMS)⁽²⁵⁾, which evaluates the patient's conditions to receive relief strategies of thirst and its discomforts.

The results evidenced in this study are expected to contribute to improving the care with patients undergoing surgical procedures, considering the thirst as a real and treatable discomfort in the IPOPOP, allowing for a more humane care.

The non-probabilistic sample was probably a limitation of the study, considering that this was delimited by a specified period, which may interfere with the results found.

Conclusion

The study revealed that thirst is prevalent among orthopedic surgical patients in the IPOPOP, although few verbalized it spontaneously. There was a significant correlation between intensity

and discomfort, that is, the more intense the thirst, the greater the discomfort caused by it.

Regarding the presence of thirst, there was a prevalence ratio between patients aged between 21 and 40 years and PTDS attributes - with the exception of bad taste in the mouth, demonstrating that the thirst is a symptom that causes discomfort.

In view of the high prevalence and intensity of thirst, it becomes important to recognize this symptom as a stressor and uncomfortable for the surgical patient, as well as the pain. The appreciation of this symptom by professionals is indispensable for the identification, measurement and treatment of thirst.

Collaborations:

1 – conception, design, analysis and interpretation of data: Rayane Nascimbeni Maldonado, Marcela Maria Birolim and Lígia Fahl Fonseca;

2 – writing of the article and relevant critical review of the intellectual content: Rayane Nascimbeni Maldonado, Marília Ferrari Conchon and Lígia Fahl Fonseca;

3 – final approval of the version to be published: Rayane Nascimbeni Maldonado, Marília Ferrari Conchon and Lígia Fahl Fonseca.

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