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RESEARCH

PROLONGED POSTOPERATIVE FASTING: A NEGLECTED PROBLEM

JEJUM PÓS-OPERATÓRIO PROLONGADO: UM PROBLEMA NEGLIGENCIADO

AYUNO POSTOPERATORIO PROLONGADO: UN PROBLEMA NEGLIGENCIADO

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ABSTRACT

Objective: to analyze the fasting time and type of the diet prescribed for the food reintroduction during the postoperative period of different surgical specialties. **Method:** this is a quantitative, retrospective, documentary, and descriptive study with medical records of surgical patients. The study had a randomized and stratified sample with 464 patients carried out in a large public university hospital in Paraná. We performed a descriptive statistical analysis, presenting measures of central tendency and their confidence intervals. **Results:** the mean post-operative fasting was 9:54 hours (SD: 6:89), ranging from 8 to 30 hours. The cardiac surgery, thoracic surgery, and neurosurgery were the clinics that presented the longest fasting time with averages of 18:25, 14:45, and 12:22 hours, respectively. Regarding the diet prescription in the immediate postoperative period, 51.3% of the patients received a general diet, 15.3% a light diet, and 11.9% fasted for the first 24 hours after the surgical procedure. **Conclusion:** the fasting time found in this institution exceeds the current recommendations of national and international protocols, showing an increase in discomfort for the surgical patient such as thirst, hunger, and stress, in addition to dissatisfaction with the service provided by the health team.

Keywords: Postoperative Period; Diet; Fasting; Prescriptions; Thirst.

RESUMO

Objetivo: *analisar o tempo de jejum e tipo de dieta prescrita para reintrodução alimentar no pós-operatório de diferentes especialidades cirúrgicas.* ***Método:*** *estudo quantitativo, retrospectivo, documental e descritivo dos prontuários de pacientes cirúrgicos, com amostra randomizada e estratificada de 464 pacientes, realizado em hospital universitário público de grande porte no Paraná. Realizou-se análise estatística descritiva, apresentando medidas de tendência central e seus intervalos de confiança.* ***Resultados:*** *a média de jejum pós-operatório foi de 9:54h (DP: 6:89), variando de 8 a 30 horas. As clínicas que apresentaram maior tempo de jejum foram cirurgia cardíaca, cirurgia torácica e neurocirurgia, com médias de 18:25h, 14:45h e 12:22h, respectivamente. Quanto à prescrição de dieta no pós-operatório imediato, 51,3% dos pacientes receberam dieta geral, 15,3% dieta leve e 11,9% mantiveram jejum nas primeiras 24 horas após o procedimento cirúrgico.* ***Conclusão:*** *o tempo de jejum encontrado nessa instituição excede as atuais recomendações de protocolos nacionais e internacionais, o que implica aumento de desconfortos para o paciente cirúrgico, como sede, fome e estresse, além da insatisfação com o serviço prestado pela equipe de saúde.*

Palavras-chave: *Período Pós-Operatório; Dieta; Jejum; Prescrições; Sede.*

RESUMEN

Objetivo: *analizar el tiempo de ayuno y tipo de dieta prescrita para la reintroducción alimentaria postoperatoria de diferentes especialidades quirúrgicas.* ***Método:*** *estudio cuantitativo, retrospectivo, documental y descriptivo de historias clínicas de pacientes quirúrgicos, con una muestra aleatorizada y estratificada de 464 pacientes, realizada en un gran hospital universitario público de Paraná. Se realizó análisis estadístico descriptivo, presentando medidas de tendencia central y sus intervalos de confianza.* ***Resultados:*** *el ayuno postoperatorio medio fue de 9: 54h (DP: 6:89), con un rango de 8 a 30 horas. Las clínicas que mostraron mayor tiempo de ayuno fueron cirugía cardíaca, cirugía torácica y neurocirugía, con medias de 18: 25h, 14: 45h y 12: 22h, respectivamente. En cuanto a la prescripción de dieta en el postoperatorio inmediato, el 51,3% de los pacientes recibió dieta general, el 15,3% dieta ligera y el 11,9% ayuno durante las primeras 24 horas posteriores al procedimiento quirúrgico.* ***Conclusión:*** *el tiempo de ayuno encontrado en esta institución supera las recomendaciones vigentes de los protocolos nacionales e internacionales, lo que implica un aumento de las molestias para el paciente quirúrgico, como sed, hambre y estrés, además de insatisfacción con el servicio brindado por el equipo de salud.*

Palabras clave: *Periodo Posoperatorio; Dieta; Ayuno; Prescripciones; Sed.*

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INTRODUCTION

Fasting before and after the surgical anesthetic procedure is a usual care to prevent complications such as bronchoaspiration. Bronchoaspiration is an adverse respiratory event that can lead to pneumonia, longer patient hospitalization, treatment costs, and even death and it was more frequent when anesthetic techniques were rudimentary.[1]

The conventional justification for the concern with respiratory complications is because the surgical patient is part of a risk group and especially because he receives analgesic and anesthetic drugs associated with the manipulation of the viscera during the procedure, leading to a decrease in intestinal motility. This condition is temporary, although it causes nausea and vomiting in the postoperative period (PP).[2]

However, with the advancement of evidence-based medicine, the established clinical procedures must be substantiated empirically.[1] Therefore, the need for long periods of fasting is challenged due to the fact that, currently, pulmonary aspiration in adults is infrequent, ranging from 1:1,000 to 1:10,000[3,4] and the development of multimodal protocols provided new evidence. In the pre-operative, the recommendation is fasting for two hours for clear liquids, four hours for breast milk, six hours for infant formula, non-breast milk, and a light diet, and eight hours for a solid diet.[5]

However, several factors contribute to the increase in pre-operative fasting time such as delays in previous surgeries, maximization of fasting by the patient, changes in surgery schedules, among others.[6] These unnecessary hours of fasting can lead to metabolic and clinical damage, influencing the general well-being of the patient.[1,6]

The literature[4,5,7] has particularly focused on the study of pre-operative fasting. A fasting time also extends to the PP when a six-hour organizational culture is routinely adhered with protocols of "nothing through the mouth", with great variability, according to the institution, the type of surgery, and the individual aspects of the professionals involved.

However, this routine goes against the recent guidelines of multimodal protocols to accelerate the post-operative recovery of the surgical patient through several measures such as the reduction of fasting time.[8,9] A meta-analysis reveals that patients undergoing multimodal protocols with abbreviated perioperative fasting time such as two hours before surgery for clear liquids without residues, had a lower risk of complications and reduced hospital stay.[10]

The recommended fasting time in the PP depends on the procedure. It may vary from six to eight hours for patients who undergo surgical procedures that do not involve the gastrointestinal tract and from 24 hours or more for surgeries in which digestive organs are manipulated, ensuring the return of peristalsis if the patient is hemodynamically stable.[7,11]

This is also recommended in cases of digestive anastomoses. In surgeries such as video cholecystectomy, herniorrhaphies, and anal-orifice surgeries, the immediate initiation of diet and oral hydration is recommended, without the use of intravenous hydration. In clinical practice, these recommendations are not followed and the fasting time may be reduced or excessively dilated, leading to an increase in the length of hospital stay and post-surgical complications such as hunger, stress, and thirst.[12]

Thirst is one of the factors that contribute to patient dissatisfaction with their surgical experience, which has been reported as the worst discomfort in the immediate postoperative period (IPP), overcoming hunger.[13] Thirst generates a negative perception of the perioperative period, especially when the fasting period is longer than necessary.[14]

Considering the scenario of long fasting periods in preoperative and PP and their repercussions on patient satisfaction and well-being, a medical prescription that respects the correct fasting time becomes a fundamental part of evidence-based care, guiding the release and type of diet to be offered to the patient. In this context, this study aimed to analyze the fasting time and type of diet prescribed for food reintroduction in the PP of different surgical specialties.

METHOD

This is a quantitative, retrospective, documentary, and descriptive study with medical records of surgical patients carried out in a large public university hospital in Paraná. The institution has 313 beds and is a reference for trauma, burn treatment, high-risk pregnancy, and bone marrow transplantation. The surgical center has seven operating rooms and on average 500 surgeries per month. It also has a Post Anesthesia Care Unit (PACU) with six beds.

The sample was probabilistic, random, and stratified by the surgical clinic. The values for the sample calculation included the production of the operating room between July and September 2017 (1,502), the proportion of patients who stayed in prescribed post-operative fasting (50%), the precision error of 5%, and the level confidence of 95%.

The study sample, with no age limit, consisted of patients who underwent procedures in 12 surgical clinics (Table 1). The inclusion criteria for the composition of the sample were having performed any surgical procedure in July, August, or September 2017 and having their medical records available in full. We excluded thirteen patients from the study who were referred to the intensive care unit in the IPP, that is, within the first 24 hours after the end of the surgical procedure, or who died in the perioperative period.

Scientific Initiation students collected the data participating in the Study and Research Group on Thirst, who received training to standardize data collection and ensure its quality. The medical records were accessed at the hospital's Medical and Statistical Archive Service through a list of patients resulting from the sampling stage, carried out from June 2018 to May 2019.

Thus, we used a Data collection tool with variables divided into three groups: identification data, registration in the PACU medical records, and data of medical and Nursing prescriptions related to fasting and diet release. Members of the research group analyzed the Data collection tool to ensure the evaluation of the variables of interest. A pilot study was carried out to adjust the instrument, without the need for substantial changes.

The PP fasting time variable was considered from the time of leaving the operating room until the release of the diet. For this study, the Nursing notes referring to food were considered as food reintroduction in the PP. These variables are presented as the mean, standard deviation, and minimum and maximum values in hours.

The variables gender, surgical clinic, bleeding classification, and the American Society of Anesthesiologists (ASA) classification - a global score that assesses the physical status of patients before the operation - were described in absolute numbers and frequencies. We also collected from the medical records: the registration of the sensation of thirst and its intensity, evaluated by a numerical verbal scale (NVS) from 0-10 (zero without thirst and 10 the greatest thirst experienced), the registration of some thirst relief strategy and description of the relief strategy applied.

Data were double typed and tabulated in the Microsoft Excel® program, receiving statistical treatment with the aid of the R version 3.5.3 program. We analyzed the central measurements (mean and standard deviation) for the variables age and PP fasting time.

Shapiro-Wilk test verified the adherence to normality. To identify extreme values and outliers, we calculated the median, the lower quartile (Q1), and the upper quartile (Q3). The difference between Q1-Q3 was called the limit (L), and the values found in the range of Q3+1.5L and Q3+3L and the range Q1-1.5L and Q1-3L were considered outliers and analyzed separately. The cut-off point for higher outliers was 30 hours, thus, 22 medical records were analyzed separately.[15]

This study is part of a larger project entitled "Immediate post-operative fasting practices: evaluation of medical prescription and perceptions of the patient and team". We followed the conditions established in Resolution nº 466/2012 of the National Health Council (*Conselho Nacional de Saúde* - CNS) and approved by the Ethics Committee of the *Universidade Estadual de Londrina* (CEP-UEL) (CAAE: 87252518.8.0000.5231). The researchers signed the Term of Secrecy and Confidentiality.

Table 1 - Surgical production distributed by clinics in 2017. *Londrina*, *Paraná*, 2019 (n=464)

Surgical Clinic	July	August	September	Total	Sample
Orthopedic (ORTOP)	113	123	121	357	110
Obstetric (CO)	96	93	103	292	90
Digestive System (CAD)	75	72	86	233	72
Urological (URO)	53	56	68	177	55
Children (CI)	37	38	59	134	41
Neurologic (NEURO)	25	34	25	84	26
Vascular (VASC)	28	16	20	64	20
Thoracic (TORAX)	26	12	16	54	17
Maxillofacial (BUCO)	16	19	16	51	16
Gynecological (CG)	13	13	13	39	12
Plastic (PLAST)	4	3	4	11	3
Cardiology (CARDIO)	1	3	1	5	2
Total	**488**	**482**	**532**	**1.502**	**464**

RESULTS

The study consisted of 464 medical records of patients distributed in 12 surgical clinics (Table 1). The sample had 235 women (50.6%) and 229 men (49.4%). Regarding the factors related to the surgical procedure, 44.6% of the patients were classified ASA II, the most used anesthetic technique was the spinal (40.7%) and 82.8% presented little bleeding. During the IPP, there was underreporting of the thirst symptom, with 46.3% of the medical records without any record. Fasting was maintained for 11.9% of the individuals. Table 2 shows the complete characterization of the individuals.

After the surgical procedure, 323 (69.6%) patients were referred to the PACU. The other 141 (30.4%) recovered from the anesthesia in the operating room (OR). In 209 (45.0%) medical records, the patient was not thirsty, and 40 (8.6%) were thirsty, with intensity ranging from eight to 10 in NVE. As a thirst-relieving strategy, 31 patients received an ice popsicle. No conduct was recorded for the other nine patients who were thirsty. We observed that in 215 medical records (46.3%) there was no information regarding their thirst.

After anesthetic recovery both in the PACU and in the OR, all patients were referred to the wards, where food reintroduction took place and their medical records were analyzed. Table 3, Figure 1, and Figure 2 show the data regarding fasting time in the PP.

Table 2 - Characterization of patients according to age, gender, bleeding classification, ASA classification, anesthetic technique, and type of diet prescribed in the post-operative period. *Londrina*, *Paraná*, Brazil, 2019 (n=464)

Variables	Mean	SD	Median	IQR	P*
Age	38.7	21.4	36.0	29.2	<0.05
Gender			**Frequency**	**Percentage**	**CI 95%**
Female			235	50.6	46.0-55.3
Male			229	49.4	44.7-53.9
Bleeding					
Small			384	82.8	78.9-86.0
Medium			73	15.7	12.6-19.4
Big			7	1.5	0.6-3.2
Classification ASA					
ASA 1			198	42.7	38.1 – 47.3
ASA 2			207	44.6	40.0 – 49.3
ASA 3			55	11.9	9.1 – 15.2
ASA 4			4	0.8	0.3 – 2.3
Anesthetic technique					
Spinal			189	40.7	36.2-45.4
General balanced			82	17.7	14.4-21.5
General inhalation			64	13.8	10.8-17.3
General venous			55	11.9	9.1-15.2
Sedation			15	3.2	1.9-5.4
Others			59	12.7	9.9-16.2
Type of diet prescribed to patients in the IPP					
General diet			238	51.3	46.6-55.9
Light diet			71	15.3	12.2-18.9
Fasting			55	11.9	9.1-15.2
General low sodium diet			26	5.6	3.7-8.2
Bland diet			17	3.7	2.1-5.9
Liquid diet			15	3.2	1.8-5.3
Others			42	9.0	6.6-12.1
Thirst intensity					
No information regarding thirst			215	46,3	41.7-50.9
Did not feel thirsty			209	45,0	40.5-49.7
Thirsty			40	8,6	6.3-11.6
Thirst Relief Strategy Record			31	6,7	4.6-9.4

* Shapiro-Wilk test; SD: standard deviation; IQR: interquartile range; CI 95% confidence interval of 95%.

Of the 464 medical records analyzed, 400 (86.2%) had no record of a medical recommendation on the appropriate time to release the diet in the PP. The records of recommendations for diet release (n=64) included a time of six hours after spinal anesthesia (n=47; 73.4%), only after being wide awake (n=14; 21.9%), after 15 hours (n=1; 1.5%), after 24 hours (n=1; 1.5%) and breast milk on demand (n=1; 1.5%).

Table 3 - Post-operative fasting time by the surgical clinic and post-operative fasting time of extreme values found by the surgical clinic. *Londrina, Paraná*, Brazil, 2019 (n=464)

Surgical Clinic (n=442)	Mean*	SD	Minimum	Maximum
Cardiac	18.2	-	18.2	18.2
Thoracic	14.4	8.1	0.8	25.8
Neurologic	11.8	8.2	1.1	27.0
Digestive System	11.6	7.2	1.3	30.0
Maxillofacial	10.9	8.2	0.2	27.2
Children	9.8	7.4	0.5	24.2
Vascular	9.3	8.3	0.1	26.4
Gynecological	9.0	7.4	1.2	28.1
Urological	8.9	5.7	0.1	26.3
Orthopedic	8.5	6.8	0.1	26.7
Obstetric	8.1	5.2	0.2	22.3
Plastic	3.8	0.9	2.7	4.7
All clinics	9.5	6.9	0.1	30.0
Extreme values (n=22)	**Mean***	**SD**	**Minimum**	**Maximum**
Digestive System (n=10)	52.2	15.1	35.0	73.2
Maxillofacial (n=1)	49.7	-	49.7	49.7
Children (n=4)	46.7	11.6	38.3	63.4
Obstetric (n=1)	32.2	-	32.2	322
Neurologic (n=4)	41.9	9.0	36.2	55.3
Thoracic (n=1)	41.8	-	41.8	41.8
Cardiac (n=1)	43.2	-	43.2	43.2

SD: Standard deviation.
*Mean presented in decimal hours.

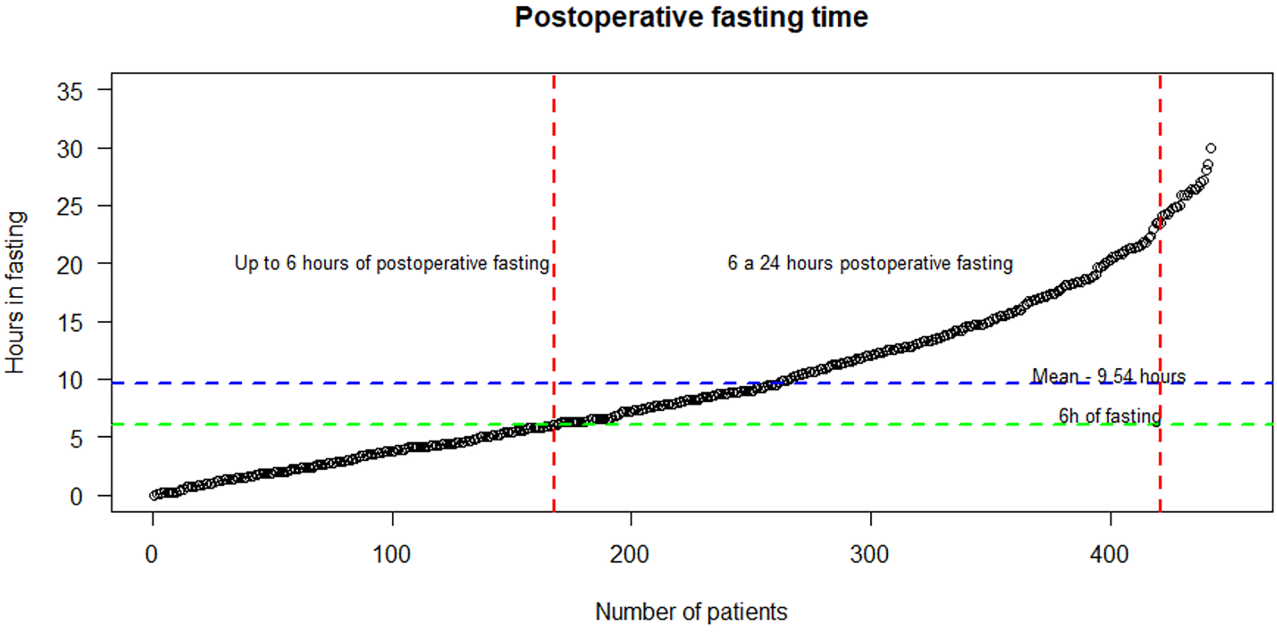

Figure 1 - Dispersion of patients in the post-operative fasting time in hours, excluding extreme values. *Londrina, Paraná*, Brazil, 2019 (n=442)

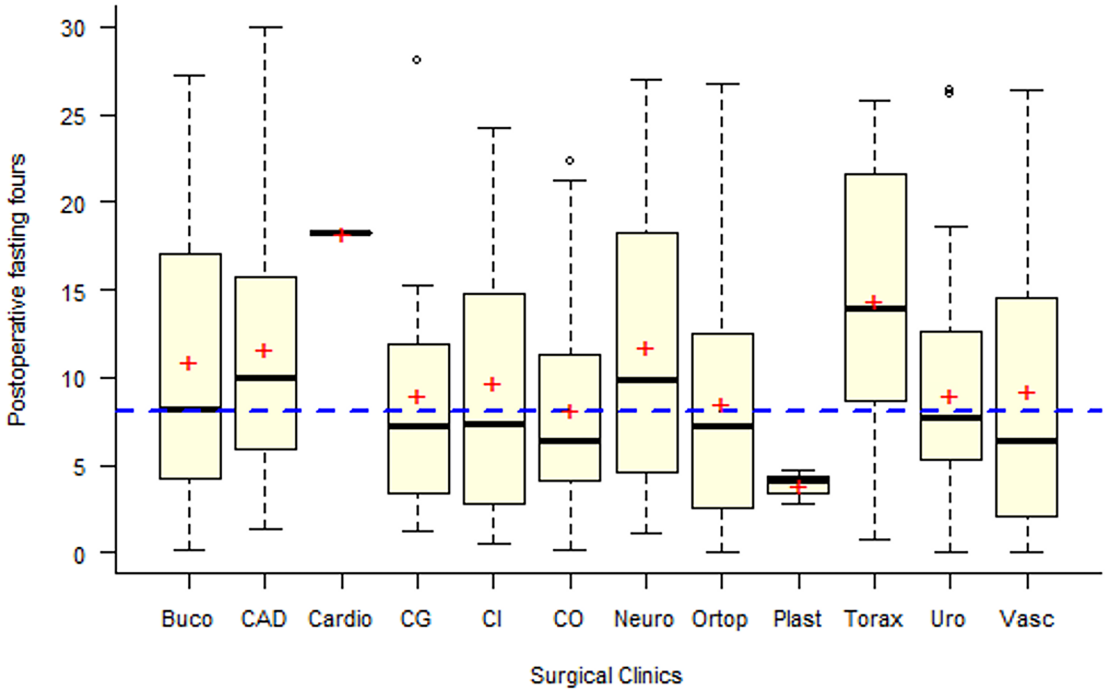

Figure 2 - Minimum, maximum, mean, and median postoperative fasting time in hours, per surgical clinic, excluding extreme values. *Londrina*, *Paraná*, Brazil, 2019 (n=442).

DISCUSSION

This study confirmed that the perioperative fasting time in clinical practice was longer than the recommendation of several national and international references.[3,7] In addition, in addition to the fasting time of all clinics varying between one and 30 hours, there were extreme values that reached more than 73 hours of fasting. We also found that most medical records (86.2%) did not contain guidance for food reintroduction, increasing the time of post-operative fasting.

In addition to the lack of evidence regarding the appropriate time for food reintroduction in the PP to the detriment of studies that address the abbreviation of pre-operative fasting, there is no consensus on how early this food reintroduction should be. This study shows its relevance when analyzing the fasting time and type of diet prescribed for food reintroduction in the PP in a public institution and also in detecting weaknesses in the compliance to evidenced-based protocols on safe practices and recommendations regarding early refeeding in the PP.

Several studies show the Brazilian reality with a higher mean of fasting, similar to our findings: 17.9 hours (SD 17.8) in size one surgeries and 45.8 (SD 35.0) in large surgeries. two;[12] 18.2 hours, ranging from 3.3 hours to 98.8 hours.[16]

These results highlighted the extreme values of absolute fasting time, which represent intense suffering for these patients. Therefore, the lack of adherence to guidelines on fasting in the PP is not an exclusive reality of the institution studied, which shows a gap between the fasting time recommended by scientific evidence and what is performed in clinical practice.

This scenario has serious implications, negatively influencing surgical recovery. Among them, we emphasize the increased length of stay, insulin resistance, delay in the healing process, and increased mortality.[4,10,11,17]

We highlight some findings in this study such as the fact that a child was subjected to an absolute fast for 63.4 hours. Conducts like this increase the harmful and sometimes irreparable consequences related not only to clinical recovery but also to psychological repercussions on the child and their caregivers.[18]

However, in clinical practice during surgeries of the digestive system, fasting time in the PP is even longer, based on the justification that the manipulation of the organs of the abdominal cavity can lead to malfunction of the gastrointestinal tract, causing paralytic ileus. However, a randomized trial demonstrates that early oral reintroduction of low-residue diets is more effective than clear liquids in preventing nausea and promoting the return of bowel function after colorectal surgery.[19]

A decisive factor for food reintroduction in the PP is to insert the recommendations for diet release in the medical prescription. This observation is supported by a determining factor, which is the percentage of patients who did not undergo surgical procedures in the gastrointestinal tract and still maintained fasting in the first 24 hours after surgery. Although all medical prescriptions recommend the type of diet to be offered in the PP, only 64 prescriptions found recommendations regarding the time or conditions for the release of the diet.

This scenario implies in difficulties for the Nursing and nutrition teams, who need to contact the medical team to receive guidance on the time or under which clinical conditions the diet can be released to the patient. This causes the fasting time to increase unnecessarily,[20] which can delay recovery from the procedure, increase the suffering imposed by fasting and generate negative feelings in the patient regarding the care provided to him by professionals.[21]

Even in the case of patients for whom the medical team had prescribed release of fasting with guidelines about the time and, consequently, the diet to be offered, the Nursing records of some of them contained a longer or shorter time than the prescription by the doctor. This discrepancy can be discussed by analyzing the existence of specific routines for requesting and delivering diets by the nutrition sector, the patient's refusal to accept the diet at the prescribed time, or even failure in communication between the teams, which results in non-compliance with guidelines.

Paradoxically, all these factors mentioned contribute to the permanence of fasting in the PP and cause discomfort to the patient, such as thirst, whose prevalence varies from 84%22 to 97.6%.23 Paradoxically, we found a low manifestation of thirst (8, 6%) described in the medical records evaluated in this study. This observation highlights serious flaws in Nursing records in this prevalent symptom. This deficiency is a common issue in clinical practice, requiring resolution due to the ethical and legal support that the patient's medical record represents.

Similarly, there was insufficient information in the medical records regarding the management of thirst - conduct that should be taken while the patient is in the PACU. This lack of registration reveals the undervaluation of the symptom by the perioperative team,[24,25] who believe that thirst is a "price to be paid" for the patient to safely go through the perioperative period.

The lack of records differentiating the reintroduction of solids and liquids in the PP is questioned. This reflection is relevant since the gastric emptying time is different for solids and liquids, which allows the early release of clear liquids.[26] Studies on the introduction of cold strategies[22,25], even within 30 minutes after the end of the surgery, indicate that the use of strategies to manage the patient's thirst can and should be addressed early, safely, and efficiently. There is no individual form of reintroduction of different types of food in the medical records.

The flaws found in the Nursing notes reinforce the limitation of this study. The lack of record in the medical prescription about time recommendations or the patient's clinical conditions for the release of diet shows insecurity regarding the conducts to be followed. Also, controversial data between medical and Nursing prescriptions about the time of patient refeeding hindered the collection and analysis of data.

Some strategies can be indicated to shorten the fasting time in the PP. The personalized prescription of each patient will allow the reduction of discomforts from prolonged and unnecessary PP fasting. Continuing education programs for the entire team on updated guidelines, medical prescriptions, and detailed Nursing notes are needed to raise awareness of the topic and change empirical practices.

Our findings in this study indicate that we need more studies with rigorous methods to identify the safe time for food reintroduction in the IPP, with the consequent knowledge translation to clinical practice.

CONCLUSION

Post-operative fasting time was high, above the recommendation of scientific evidence. In most medical records, there was no information of the type and time of diet to be offered during this period, nor any differentiation between solid and liquid diet, both in medical and Nursing prescriptions. The notes referring to the reintroduction of the diet proved to be flawed and incomplete.

Thus, due to the quality of multi-professional care, the health and teaching institutions, and the multi-professional team need to adopt protocols that guide practice based on safe and up-to-date evidence on reducing pre-operative fasting time and early food reintroduction.

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