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ORIGINAL ARTICLE

Effects of carbohydrate use on preoperative thirst: a randomized clinical trial

Efeitos da utilização do carboidrato sobre a sede no pré-operatório: ensaio clínico randomizado

Efectos de la utilización del carbohidrato sobre la sed en el preoperatorio: ensayo clínico randomizado

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ABSTRACT

Objectives: to evaluate the effectiveness of carbohydrate popsicles, carbohydrate solution, and usual care (fasting) on the intensity and discomfort of preoperative thirst. **Methods**: a randomized clinical trial with 60 preoperative patients aged between 18 and 60 years, randomized into three groups: control (fasting), carbohydrate solution (100 ml), and carbohydrate popsicle (100 ml). The outcomes were thirst intensity and discomfort. **Results**: there was a difference between groups for final thirst intensity (p = 0.01) and final thirst discomfort (p = 0.001). The effect size for both the Solution Group and the Popsicle Group was robust: 0.99 and 1.14, respectively. **Conclusions**: the groups that received the carbohydrate fasting abbreviation showed a reduction in thirst discomfort compared to the control group. The carbohydrate popsicle proved more effective in reducing the intensity of thirst. NCT: 3.209.283
Descriptors: Fasting; Thirst; Carbohydrates; Perioperative Nursing; Controlled Clinical Trial.

RESUMO

Objetivos: avaliar a efetividade do picolé de carboidrato, solução de carboidrato e cuidado usual (jejum) sobre a intensidade e desconforto da sede no pré-operatório. **Métodos:** ensaio clínico randomizado, com 60 pacientes no pré-operatório, idade entre 18 e 60 anos, aleatorizados em três grupos: controle (jejum); solução de carboidrato (100 ml); picolé de carboidrato (100 ml). Os desfechos foram a intensidade e o desconforto da sede. **Resultados:** houve diferença entre os grupos quanto à intensidade final da sede (p = 0,01) e ao desconforto final da sede (p = 0,001). O tamanho do efeito tanto para o Grupo Solução quanto para o Grupo Picolé foi forte: 0,99 e 1,14, respectivamente. **Conclusões:** os grupos que receberam a abreviação do jejum com carboidrato apresentaram redução no desconforto da sede quando comparados ao grupo-controle. O picolé de carboidrato mostrou-se mais efetivo na redução da intensidade da sede. NCT: 3.209.283
Descritores: Jejum; Sede; Carboidratos; Enfermagem Perioperatória; Ensaio Clínico Controlado.

RESUMEN

Objetivos: evaluar efectividad del polo de carbohidrato, solución de carbohidrato y cuidado usual (ayuno) sobre la intensidad e incomodidad de sed en el preoperatorio. **Métodos:** ensayo clínico randomizado, con 60 pacientes en el preoperatorio, edad entre 18 y 60 años, randomizados en tres grupos: control (ayuno); solución de carbohidrato (100 ml); polo de carbohidrato (100 ml). Los desfechos fueron la intensidad e incomodidad de sed. **Resultados:** hubo diferencia entre los grupos cuanto a la intensidad final de sed (p = 0,01) e incomodidad final de sed (p = 0,001). El tamaño del efecto tanto para el Grupo Solución cuanto para el Grupo Polo fue fuerte: 0,99 y 1,14, respectivamente. **Conclusiones:** los grupos que recibieron la abreviación del ayuno con carbohidrato presentaron reducción en la incomodidad de sed cuando comparados al grupo-control. El polo de carbohidrato se mostró más efectivo en la reducción de la intensidad de la sed. NCT: 3.209.283
Descriptores: Ayuno; Sed; Carbohidratos; Enfermería Perioperatoria; Ensayo Clínico Controlado.

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INTRODUCTION

Preoperative fasting comprises the period before surgery in which the patient is not allowed to ingest liquids or solids orally[1]. This practice, instituted to ensure gastric emptying, is focused on preventing anesthetic complications. However, it is already known that reducing the time of fasting to two hours before surgery does not pose risks to the surgical patient[2].

The Brazilian ACERTO protocol (Accelerated Total Postoperative Recovery - *Aceleração da Recuperação Total Pós-Operatória*), derived from the European ERAS (Enhanced Recovery After Surgery), was developed to contribute to the recovery of the surgical patient[3]. ACERTO recommends abbreviating fasting with a carbohydrate solution (maltodextrin), a polysaccharide with a low glycemic index. Carbohydrate contributes to a better body response to surgical trauma[2]. A concentration of 12.5%, in the form of dilution powder, in volumes of 400 and 200 milliliters (ml), respectively, is recommended six and two hours before surgery[4]. The primary justification for using maltodextrin concerns the gastric emptying time, which occurs between 15 and 20 minutes after ingestion.

Prolonged fasting may trigger symptoms such as hunger, anxiety and thirst[5-6]. The latter is reported by patients as one of the most distressing experiences during the perioperative period[7], causing anxiety, feelings of near death and despair. It can be measured by the Visual Analog Scale (VAS), Perioperative Thirst Discomfort Scale (EDESP) and by blood osmolarity markers among others[8]. Emotional changes, such as anxiety, along with restricted fluid intake tend to cause greater body imbalance. To restore the hydro electrolytic balance, individuals, through the activation of a complex neurohormonal system, feel motivated to seek water[9-10]. Studies have reported a high prevalence of perioperative thirst[9-10]. In the preoperative period, a 90% incidence of thirsty patients was observed at admission to the operating room[11].

In addition to using carbohydrate-rich beverages preoperatively, strategies that employ cold and mentholated substances, such as ice popsicles and mentholated popsicles, show effective results in reducing thirst intensity and discomfort[9,12]. These cold strategies take advantage of the presence of receptors in the oral cavity, called Transient Receptor Potential Melastatin 8 (TRPM8) - calcium channels located in the trigeminal and glossopharyngeal nerve endings - that are activated when in contact with menthol and substances at low temperatures, generating a sensation of pleasure and satiety, even with small volumes[13].

Using the carbohydrate-enriched solution in the preoperative period is already a practice consolidated by high evidence studies, reducing surgical site infection rates, hospital length of stay, and preoperative and postoperative thirst[4,6]. However, carbohydrates at low temperatures have not been yet researched. The relevance of this investigation will be in examining whether the frozen carbohydrate effectively reduces thirst compared to liquid carbohydrates and usual care, which will reduce the risk of bronchoaspiration by the small volume needed with the consequent lower cost of the solution.

The primary hypothesis of this study was that patients receiving any carbohydrate intervention (solution or popsicle) would have reduced thirst intensity and discomfort compared to patients receiving usual care (fasting). The secondary hypothesis of the study was that patients receiving a carbohydrate popsicle would have a greater reduction in thirst intensity and discomfort compared to the other two groups.

OBJECTIVES

To evaluate the effectiveness of the "carbohydrate popsicle" and "carbohydrate solution" strategies compared with usual care (fasting) on the intensity and discomfort of thirst in preoperative patients after 30 minutes starting from the end of the interventions.

METHODS

Ethical aspects

The study was approved by the Ethics Committee on Research Involving Human Beings of the university connected to the research, with prior registration in the Brazilian Registry of Clinical Trials and Clinical Trials (REQ-8213). The participants read and signed the Informed Consent Form (TCLE), and it was explained that they could withdraw from the study at any time.

Design, period, and place of study

The study is a controlled, randomized clinical trial with three parallel groups conducted from May to September 2019 in a teaching hospital in Southern Brazil with 316 beds and performs an average of 640 surgeries/month, 250 of which are in the afternoon. The study was developed according to the guidelines recommended by the Consolidated Standards of Reporting Trials (CONSORT).

Population or sample: criteria of selection

The population was composed of surgical patients in the preoperative period. The sample comprised patients of both genders, with surgeries of all specialties scheduled for the afternoon period to ensure the safety of the three-hour interval before surgery proposed by the researcher. The hospital anesthesiology department authorized the project. Inclusion criteria were: age between 18 and 60 years, time and space-oriented, fasting for at least six hours, verbalizing thirst - spontaneously or when questioned - with intensity greater or equal to 3 in the Visual Numerical Scale (VNS)[14]. Exclusion criteria were based on the ACERTO protocol, namely: restricted swallowing, pregnant women, morbid obesity, Body Mass Index ≥ 40 or ≤ 18 (indexes for obese or malnourished individuals), diabetics treated with insulin (because of insulin, they may have a different reaction from people with diabetes to prolonged fasting), symptomatic gastroesophageal reflux, and pyloric stenosis syndrome.

Interventions

The treatment variables were carbohydrate solution and carbohydrate popsicle offered to the patient no more than three hours before surgery. The groups were: Control Group (CG) - participants who stayed fasting; Carbohydrate Solution Group (CSG) - participants who received as intervention the carbohydrate

solution (maltodextrin powder at 12.5%, diluted in 100 ml of water at room temperature). This solution was offered to the patient in transparent cups, ingested in the presence of the researcher; Carbohydrate Popsicle Group (CPG) - participants who received a carbohydrate popsicle (maltodextrin powder at 12.5%, diluted in 100 ml of water) frozen in plastic popsicle molds, attache-d by a wooden stick. The popsicles were delivered to the patients, who sucked them also in the researcher's presence. The 30-minute recording started only after the patients in the Carbohydrate Solution Group and the Carbohydrate Popsicle Group finished the intervention intake.

Collection of data and measured variables

The primary outcome was the intensity of thirst, assessed using the VNS[14], with 0 being no thirst and 10 being the most intense thirst. This scale is used widely in studies related to subjective symptoms such as pain and thirst[14]. The secondary outcome was thirst discomfort, assessed by the Perioperative Thirst Discomfort Scale (EDESP), developed, and validated by Brazilian researchers. Such scale contains items that assess dry mouth, dry lips, thick tongue, thick saliva, dry throat, bad taste in the mouth, and desire to drink water. Researchers ask patients about the discomfort experienced due to thirst, and the score of their answers are as follows: 0 = not bothered; 1 = slightly bothered; 2 = very bothered. The scale ranges from 0 to 14 points, with 14 being the most uncomfortable. It has a content validity index of 0.98, a reliability index of 1, Cronbach's alpha of 0.91, and a weighted Kappa of 1[8].

The research followed these steps: in the preoperative period, individuals who were in the inpatient care units and met the inclusion criteria were informed about the research, the groups, and the interventions, and it was made clear to them that they could withdraw from participation at any time. The researcher collected data (age, ASA score) from the medical chart. The participant answered the questions, "How long have you been fasting from solids?"; "And from liquids?" The VNS was applied to assess the initial thirst intensity and the EDESP for initial thirst discomfort, and this moment was considered a pre-intervention.

The opaque and sealed envelopes, previously randomized, were opened in front of the participants. Each one received their intervention according to what was inside the envelope, which could be CG, CSG, and CPG, which was considered moment 0 for all groups. After 30 minutes, counted from the end of the intervention ingestion or the patient had fasted, the VNS scale was applied to assess final thirst intensity, and the EDESP scale to assess final thirst discomfort. Intervention studies on thirst assess effectiveness periods of 20 to 30 minutes considering its action on pre-absorptive satiety[9,15].

In order to minimize symptoms and discomfort of patients randomized in the CG (fasting), they were offered the strategies "carbohydrate popsicle" or "carbohydrate solution" always after the end of the research protocol, according to the patient's choice and acceptance.

The anesthesiology department of the hospital authorized the project. The anesthesiologists and the nursing staff were informed daily about the inclusion of patients in the study, observing the safety period proposed by the guidelines. The participants who refused part of the interventions (carbohydrate solution or carbohydrate popsicle) continued to be included in the study sample, but the researcher measured and recorded the volume refused.

Size of the sample

For the sample calculation, the prevalence of improvement in thirst intensity and discomfort of the patients in the three groups studied was identified. The sampling calculation was performed for randomized clinical trials available in the OpenEpi virtual software. The comparison performed always had fasting as the reference category for analysis, using Fleiss' formula with continuity correction. Based on this, 13 subjects would be needed in the CSG (solution) and 13 in the CPG (popsicle) to evaluate thirst intensity. For the CG (fasting), the number of participants should equal or larger, i.e., 13 individuals, totaling 39 participants.

The pilot test was conducted using the block randomization method, following the protocol proposed for the study. Thus, 10 participants were allocated to each group, totaling 30. After concluding that phase without changes in the instrument or protocol, the pilot was included in the total sample of 60 participants, 20 in each group. The study was terminated after reaching the proposed number of 60 participants since the sample size calculation indicated the need for 39 participants to evaluate the effect of the interventions.

Randomization and masking

Randomization was performed in blocks, using a list generated by Microsoft Office Excel® (version 16): five blocks were used, two with 15 participants, two with nine, and one with 12, thus composing three groups: CG (fasting), CSG (carbohydrate solution) and CPG (carbohydrate popsicle). Random and concealed allocation was done in sealed, opaque envelopes by a researcher who did not participate in data collection. The envelopes were opened only after assessing the initial thirst intensity and discomfort.

There was no possibility of masking since the interventions were different according to the group the patient was allocated to and were prepared and administered by the same researcher.

Statistical Analysis

Data were entered into a Microsoft Office Excel® spreadsheet (version 16) and analyzed in the Statistical Package for the Social Sciences (SPSS) program (version 20). In order to compare the demographic and clinical characteristics between groups in the initial evaluation, the Kruskal-Wallis test was used for numerical variables and the chi-square test for categorical variables. The outcomes of thirst intensity and discomfort were considered discrete quantitative variables, and the Kruskal-Wallis test was used to compare the initial and final scores and the variation between the three groups. After the Kruskal-Wallis test, multiple comparisons were tested using Dunn's test to identify which pairs of- groups differed from each other.

The variation in thirst intensity was calculated by subtracting the final and initial thirst intensity, measured by the VNS. The

variation in thirst discomfort was calculated by subtracting the final and initial thirst discomfort measured by the EDESP.

In assessing the effect size of interventions, Cohen's D was used, following the classification: small (0.20-0.49), medium (0.50-0.79), and large (0.80-1.29)[16]. A 5% significance level was adopted in all analyses, with a 95% confidence interval (CI). For the descriptive analysis of the frequency of EDESP attributes, participants were categorized into two groups: 0 = absence of attributes; 1 = presence of attributes.

RESULTS

Eight hundred eighteen eligible patients had surgery in the afternoon. The final sample was 60 participants, 20 in each group. After randomization, there was a loss to follow-up in the CPG (Figure 1).

There was no statistically significant difference among the groups, considering demographic and clinical characteristics (Table 1).

Regarding the groups studied, most participants were male, between 40 and 50 years old; according to the American Society of Anesthesiologists (ASA), the physical-anesthetic status was classified as ASA I. Median fasting for the solids and liquids ranged from 10 to 13 hours, considering the period between the patient's last ingestion and the moment of the research. In the CSG, two participants refused part of the intervention (50 ml and 60 ml). In the CPG, eight participants refused part of the intervention (minimum 20 ml, maximum 60 ml).

There was a statistically significant difference between the groups regarding the intensity of the final thirst ($p = 0.01$). By Dunn's test, it was verified that the CG and CPG groups differed. When comparing the CG and PCG groups, Cohen's D showed an effect value of great magnitude (0.94) (Table 2).

As for the variation in thirst intensity, there was a significant difference between the CSG and CPG groups compared to the usual care (CG) ($p < 0.001$), with effects of great magnitude (1.08 and 1.76).

When using EDESP to assess thirst discomfort, there was also a difference between the groups after the intervention ($p = 0.001$). The difference occurred between CG and CSG, as well as between CG and CPG. The effect was of significant magnitude (0.99 and 1.14, respectively) in both situations (Table 2).

Regarding the variation in the EDESP, there was also a statistically significant difference between the groups ($p < 0.001$), showing a difference between those who received any intervention compared to usual care, with effects of great magnitude (1.48 for CSG and 3.76 for CPG).

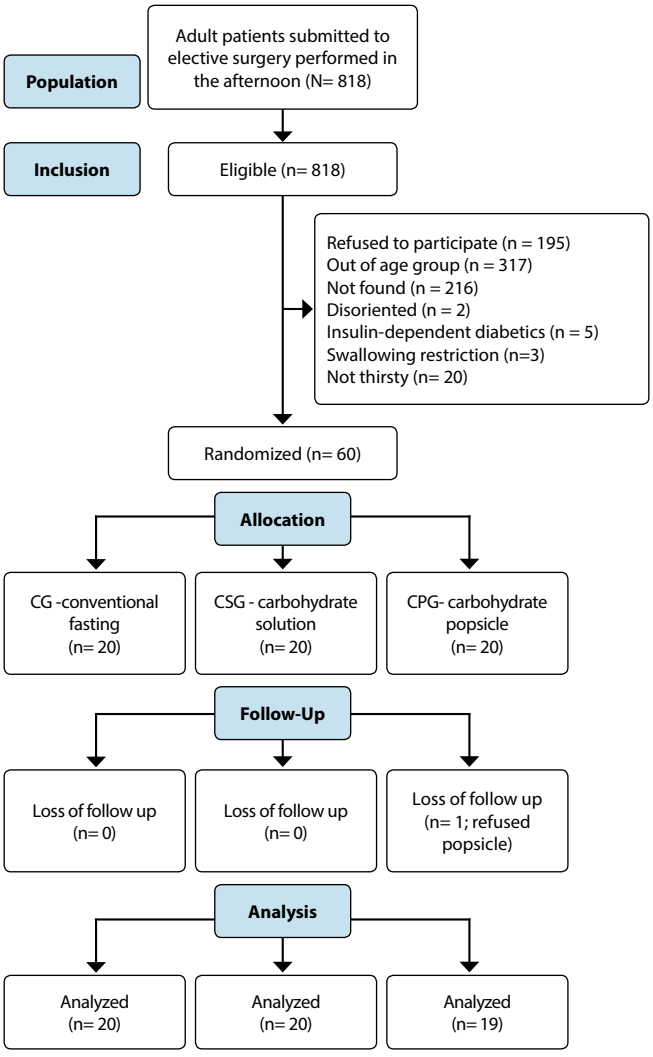

Figure 1 – Sampling and Randomization Diagram, Londrina, Paraná, Brazil, 2019

Table 1 – Distribution of demographic and clinical characteristics and time of fasting in relation to the Control, Carbohydrate Solution and Carbohydrate Popsicle groups, Londrina, Paraná, Brazil, 2019

Variáveis	Control Group(n = 20) Median (1st and 3rd quartile)	Solution Group (n = 20) Median (1st and 3rd quartile)	Popsicle Group (n = 19) Median (1st and 3rd quartile)	*p* value
Age (years)	50.0 (40.3. 52.0)	41.0 (35.0. 49.0)	43.0 (28.0. 43.0)	0.120*
Full fasting (hours)	12.9 (11.16. 14.5)	13.25 (12.06. 14.3)	11.5 (10.66. 13)	0.124*
Liquid fasting (hours)	11.8 (10.38. 13.53)	12.18 (10.46. 13.25)	10.91 (10.5. 12.58)	0.800*
	n (%)	**n (%)**	**n (%)**	***p* value**
Gender				
Male	9 (29.0)	9 (29.0)	13 (42.0)	0.242**
Female	11 (39.3)	11 (39.3)	6 (21.4)	
ASA				
I	11 (34.4)	10 (31.2)	11 (34.4)	0.882**
II	9 (33.3)	10 (37.0)	8 (29.7)	

** Kruskal-Wallis. ** Chi-square.*

Table 2 – Comparison of Carbohydrate Solution Group and Carbohydrate Popsicle Group with Control Group regarding thirst intensity and discomfort, Londrina, Paraná, Brazil, 2019

Outcomes	Control Group Median (1st and 3rd quartile)	Carbohydrate Solucion Group Median (1st and 3rd quartile)	Carbohydrate Popsicole Group Median (1st and 3rd quartile)	*p* value	CSG vs CG‡	CPG vs CG‡
Initial Intensity	8.0 (6.0. 10.0)	7.5 (6.0. 8.0)	8.0 (6.0. 10.0)	0.499	0.20	-0.16
Final Intensity	8.0 [a] (3.0. 10.0)	5.0[ab] (2.3. 5.0)	3.0[b] (2.0. 5.0)	0.010	0.91	0.94
Intensity Variation	0.0 [a] (-2.8. 0.0)	-3.0[b] (-4.0. -1.3)	-4.0[b] (-6.0. -1.0)	< 0.001	1.08	1.76
Initial EDESP	6.5 (4.0. 12.3)	8.0 (5.3. 12.8)	10.0 (7.0. 12.0)	0.298	0.66	-0.49
Final EDESP	6.5 [a] (3.0. 12.5)	3.0[b] (1.0. 5.8)	2.0[b] (1.0. 4.0)	0.001	0.99	1.14
EDESP Variation	0.0 [a] (-0.5. 0.0)	-5.0[b] (-8.0. -2.0)	-7.0[b] (-9.0. -5.0)	< 0.001	1.48	3.76

Kruskal–Wallis test. ‡ Cohen's D. ab Medians followed by the same letter in the row do not differ at 5% probability by Dunn's test.

Table 3 – Frequency of thirst discomfort attributes assessed by the Perioperative Thirst Discomfort Scale (EDESP) in the Control, Carbohydrate Solution, and Carbohydrate Popsicle groups before and after the intervention, Londrina, Paraná, Brazil, 2019

Attributes*	Control Group		Solution Group		Popsicle Group	
	Before (%)	After (%)	Before (%)	After (%)	Before (%)	After (%)
Dry mouth	65.0	55.0	90.0	40.0	94.7	15.8
Dry lips	65.0	65.0	65.0	45.0	78.9	10.5
Thick tongue	45.0	45.0	70.0	15.0	57.9	26.3
Thick saliva	90.0	90.0	95.0	55.0	100.0	47.4
Dry throat	70.0	55.0	75.0	20.0	73.7	21.1
Bad taste in the mouth	55.0	55.0	65.0	25.0	57.9	15.8
Desire to drink water	90.0	90.0	95.0	55.0	100.0	47.4

** To calculate the percentage of the attributes, responses 1 or 2 were considered, that is, the presence or absence of the attribute.*

In the Carbohydrate Popsicle Group, the attributes "thick saliva" and "desire to drink water" showed a frequency of (100%) before the intervention, with a reduction to 47.4 % after the intervention (Table 3).

DISCUSSION

This research proposed a practice already recognized in the literature: to offer a carbohydrate solution (maltodextrin) to reduce preoperative time of fasting. The possibility of the surgical patient swallowing a carbohydrate popsicle in a smaller volume to decrease thirst and its discomforts is an innovative strategy because there is no record of usage of carbohydrates at low temperatures.

The time of fasting found in this study was 12.80 hours on average for solids and 11.35 hours for liquids, which is similar to results obtained in the literature with an absolute fasting average of 17.53 hours, well beyond the two hours recommended by the ASA[1,10]. In the preoperative period, thirst symptoms, especially dryness of the oral cavity, tend to intensify, mainly due to prolonged fasting practices[7].

Perioperative thirst is a highly prevalent symptom, with rates ranging from 69% to 90% in the preoperative period[11,17]. It is worth mentioning that the clinical practice already establishes and uses the abbreviation of preoperative fasting with carbohydrate solution to reduce thirst[18-19].

Two research studies compared the effects of using an oral carbohydrate solution on thirst with conventional fasting and with placebo, showing the benefits of abbreviating fasting with carbohydrates. The present study results support those data and found a reduction in thirst intensity in the group receiving carbohydrate popsicles compared to those that fasted on solids and liquids for 10 to 13 hours[18-19].

Other findings employing cold strategies revealed similar results throughout the perioperative period. The strategies "mentholated popsicle," "ice popsicle," and a "package deal" consisting of oral swabs, cold water spray, and mentholated moisturizer achieved similar results in reducing thirst intensity in various populations, such as elderly and intensive care unit patients[9,12,20].

These results are justified mainly by the pre-absorptive satiety, thanks to anticipatory mechanisms involving mechanoreceptors, thermoreceptors (TRPM8), osmoreceptors, and gastric receptors. They activate regions in the *lamina terminalis*, allowing satiety even before blood osmolarity correction. Large volumes are not required to achieve pre-absorptive satiety, which is an essential tool for patients with restricted water intake[21-22].

The TRPM8 thermoreceptors play an essential role in reducing thirst. They are receptors located in the nerve endings present in the trigeminal and glossopharyngeal nerves of the oral cavity, and when in contact with low temperatures, they forward incoming messages to nuclei that connect to the thalamus. The thalamus sends stimuli to cortical and limbic regions, which give the individual feelings of pleasure and satiety[23].

The popsicle is a cold solid structure and, compared to the carbohydrate solution held at room temperature, showed more

effective results on thirst. Those findings are in line with another trial, which compared ice popsicles, flavored popsicles, flavored beverages, and water, showing a reduction in thirst intensity in the groups that received solid cold strategies, positively influencing saliva production and humidification of the oral cavity[24].

Swallowing is a mechanism that influences saliva production and humidification of the oral cavity. Solid strategies require a longer swallowing time than liquid strategies and therefore remain longer in contact with the mouth, increasing saliva production and promoting greater thirst satiation[24].

Because of that, the use of cold substances in clinical practice offers benefits, reducing not only the intensity of thirst but also its discomforts. As a multifactorial symptom, thirst should not be measured only by its intensity[7], and it is recognizable by the presence of discomfort evidenced by signs and symptoms such as dry mouth, bad taste in the mouth, and thick tongue, among others[8,25].

The results obtained in this study showed that the usage of carbohydrates presented a significant reduction in thirst discomforts evaluated by EDESP for both groups that received the intervention compared to the control group. It was observed that all attributes recognized as dry mouth, dry lips, thick tongue, thick saliva, dry throat, bad taste in the mouth, and desire to drink water[26] were complaints presented by patients preoperatively.

The outcomes presented in this study agree with other findings in the literature, especially a descriptive study carried out with patients in the IPO, which found a mean discomfort of 7.3, evaluated by the EDESP (scale from 0 to 14)[26]. In another study, patients indicated dry mouth as the main discomfort, and of 386 patients, 267 (69.2%) reported the presence of that symptom[10].

The ACERTO protocol emphasizes that the volume used for the abbreviation of fasting should be adapted to the reality of each institution[4]. This research used a volume of 100 ml for all interventions with carbohydrates, with positive results regarding the thirst intensity and discomfort, which agrees with other findings that used a solution volume of 200 ml or higher[18-19]. We observed that, even with the patients' partial refusal of volume for both carbohydrate solution and popsicle, the results indicate the effectiveness of the interventions on thirst intensity and discomfort.

Further studies should be conducted with the 10 mL volume of carbohydrate solution focusing on other outcomes, such as length of hospital stay and insulin resistance, among others. That would support the practice of this strategy since institutions would have the same benefits with a smaller volume while reducing the costs.

Study limitations

Factors related to seasonality and low ambient temperatures, added to the lack of flavor of the carbohydrate popsicle, were considered limitations of the study since they may have influenced the acceptance and the number of refusals.

Another possible limitation was the lack of masking from the researcher who evaluated the outcomes, although this may have had little impact since patients' self-report evaluated the outcomes.

This study evaluated the effect of the interventions on the thirst intensity and discomfort only 30 minutes after their completion. Further studies should be conducted to evaluate those strategies' extended periods of action.

Contributions to the field

The carbohydrate popsicle proves to be an innovative tool, with a smaller volume (100 ml) than usually described by the ACERTO protocol and at low temperatures (popsicle-shaped carbohydrate). Making its use feasible in practice implies improving humanized care and encouraging services to implement the abbreviation of fasting combined with concern for the patients' thirst.

CONCLUSIONS

There was a reduction in thirst intensity in the group receiving carbohydrate popsicles compared to those receiving the usual care (fasting). The reduction in thirst discomfort was significant for the popsicle and carbohydrate solution groups compared to the fasting group.

Promoting this practice is still a challenge for institutions and professionals. The myth told by patients that prolonged fasting is essential for surgery led many of them to refuse to participate in the study for fear of surgery cancellation. Therefore, recognizing the importance of more liberal fasting practices by managers and professionals is also fundamental for its implementation.

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