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Importance of fasting abbreviation and analgesia in the satisfaction and recovery of elderly patients with hip and femur fractures. retrospective study with 1,001 patients

Abstract

Background and objectives: There are several ways to assess patient satisfaction, as it is a standard indicator of the quality of care provided. The aim of this study was to evaluate whether the abbreviation of fasting with 200 ml CHO, the intake of the same beverage in the PACU, the return to oral feeding in the ward, and postoperative analgesia can improve comfort and satisfaction with anesthesia in elderly patients. with hip and femur fracture.

Methods: A retrospective trial carried out in a Brazilian public health hospital (SUS), with 1,001 patients physical status ASA I-III submitted to hip and femur fracture surgery. The following items were evaluated: preoperative fasting time, evaluation of thirst and hunger upon arrival in the operating room, time of CHO administration in the PACU, time of reintroduction of oral feeding in the ward, and at this moment, the degree of satisfaction with the anesthetic conduct, abbreviation of fasting and early feeding. A satisfaction assessment was performed with YES and NO answers regarding the pre-anesthetic visit, the fasting abbreviation, the use of CHO in PACU, refeeding in the ward, and postoperative analgesia. Family members were also asked to return immediately to the ward, without intravenous hydration and without going through the ICU.

Results: All patients had the fasting abbreviation between 1:20 h and 4:00 h. None of the 1,001 patients reported being thirsty when they arrived in the operating room, against only 26 patients reporting being hungry. The time of administration of dextrinomaltose in PACU ranged from 20 minutes to 5:45 h, and the reintroduction of oral feeding in the ward ranged from 4 h to 8:15 h. Analgesia with lumbar plexus block with a neurostimulator and levobupivacaine before or after providing mean analgesia of 22±4 h, with a minimum time of 13 h and a maximum of 34 h. All patients were able to be discharged from the hospital on the second postoperative day.

Conclusion: This study with 1,001 patients clearly shows that in hospitalized elderly, the liberal use of CHO before surgery and immediately in PACU, and better quality analgesia is an easy and practical way to increase patient comfort and satisfaction with anesthesia care and with better outcomes.

Keywords: Fasting, fast-track surgery, elderly orthopedic surgery, perioperative care, spinal anesthesia, surgery, postoperative analgesia

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Introduction

We recently published an experience with an acceleration of postoperative recovery (Projeto ACERTO) in 1,226 patients over 60 years old with hip and femur fractures, in 10 years of project implementation.[1] The implementation of the project was chosen for elderly patients in a Brazilian Public Health System (**SUS**) hospital with the objectives of reducing the length of hospital stay, surgical complications, and increasing patient satisfaction after surgery. Goals achieved in these 10 years of implementing the ACERTO project. In recent practice guidelines for preoperative fasting and the use of pharmacologic agents to reduce the risk of pulmonary aspiration, application to healthy patients undergoing elective procedures, focusing on intake of clear fluids containing carbohydrates (CHO) with or without protein, chewing gum, and duration of pediatric fasting.[2] Unfortunately, the abbreviation of fasting in elderly hip fracture patients was not addressed. The guidelines recommend that healthy adults drink CHO containing clear liquids up to 2 hours before elective procedures are submitted to general anesthesia, regional anesthesia, or sedation, and CHO can be simple or complex.[2]

The Brazilian Institute of Geography and Statistics (IBGE) showed in the 2022 Census 16.7% of elderly people, which is currently around 28 million elderly people in Brazil and should reach 32 million by 2025.[3] Studying from 2010 to 2014 in SUS patients in the state of Paraná, Brazil, 11,226 femur fractures were registered, 66.8% in women and 33.2% in men, concluding that fractures have a high incidence in the elderly and a large economic impact.[4] Patient satisfaction is a standard indicator of care quality. In a prospective and randomized study carried out in a public hospital of the SUS, with 100 patients undergoing surgery for femoral fractures, it was divided into two groups, the control group (NPO) received *nil per os* after 9:00 p.m. the night before, while patients in the experimental group (CHO) received 200 mL of a CHO (dextrin maltose) drink 2-4 hours before the operation, evaluating patient satisfaction through a questionnaire.[5] The result of this study clearly showed that in elderly people hospitalized with fractures of the femur, the liberal use of CHO is an easy and practical way to increase patient comfort and satisfaction regarding their perioperative care.

In a recent narrative review of why abbreviate preoperative fasting, 31 articles were selected, it showed that the abbreviation of preoperative fasting with a drink enriched with carbohydrates or carbohydrates and glutamine seems to be effective in the care of surgical patients, optimizing the recovery period postoperative.[6] The objective of this retrospective study, after the implementation of the ACERTO project,[7] which is the acceleration of perioperative care, was to report the intake of a drink rich in CHO before the operation, evaluate the preoperative fasting time, the time of introduction of CHO in PACU, the time of reintroduction of oral feeding in the ward, satisfaction with the anesthesia in elderly patients with hip and femoral fractures, and hospital discharge for residence.

Methods

The project to implement a multidisciplinary protocol in hip and femur orthopedic surgeries was registered at Plataforma Brazil (**CAAE**: 09061312.1.0000.5179) and approved by the Research Ethics Committee (**Number**: 171.924). The was a retrospective study carried out in several hospitals, where spinal anesthesia for orthopedic surgery in elderly patients with fractures of hip and femur was performed between January 2011 and December 2019, all spinal anesthesia were recorded in an Excel spreadsheet for further study. This study was based on the recently published 1,226 patients.[1] Due to the fact that the study was retrospective, the Free and Informed Consent Term was released. The patients also were informed about risk of spinal anesthesia. All patients' physical status ASA I-III, with hip and femur fractures aged over 60 years of both genders, scheduled for repair surgery were included in this study. All patients were hospitalized at SUS and received spinal anesthesia. Anthropometric data were collected as age, weight, height, and sex.

Inclusion criteria in the study were: normal blood volume, no pre-existing neurological disease, no coagulation disorders, no infection at the lumbar puncture site, who did not present agitation and/or delirium, did not use an indwelling urinary catheter, with a hemoglobin level>10g% and were not admitted to the ICU. Exclusion criteria were patients with previous spine surgery, patients with infection at the puncture site, clotting disorders, neurological disease, history of headache, hypersensitivity to amide local anesthetics, and refusal by the patient or family after a detailed explanation by the anesthesiologist.

The pre-anesthetic evaluation was performed on all patients by the anesthesiologists and residents of anesthesiology of the service. Before the induction of spinal anesthesia, the patient was routinely monitored (electrocardiogram, pulse oximeter, and non-invasive blood pressure measurement) and a forearm vein was punctured with a 20G or 18G venous catheter. No additional liquid was administered intravenously before the operation in all patients. Perioperative volume replacement was 4 ml/kg of crystalloids and 500 mL of 6% hydroxyethyl starch 130/0.4 in 0.9% sodium chloride (Voluven®) in all patients. Hypotension (decrease in SBP pressure <30%) was treated with intravenous ethylephrine (2 mg) and bradycardia (HR <50 beats per minute) was treated with atropine (0.50 mg).

After a study comparing NPO and fasting abbreviation from 2 to 4 hours,[5] all patients began to take part in the fasting abbreviation routine with 200 ml of dextrin maltose. After intravenous sedation with dextroketamine (0.1 mg/kg) and midazolam (0.5 to 1mg) and cleaning of the skin with chlorhexidine, a spinal puncture was performed with the patient in the sitting or left lateral decubitus position, in the midline or paramedian at L3-L4 interspaces using 27G Quincke needle. After the appearance of cerebrospinal fluid (LCS), 7.5 mg to 15 mg of 0.5% isobaric bupivacaine was administered at a rate of 1ml/15s. The patients were immediately placed in the supine position for the beginning of the surgery. All patients received 3 l/min of oxygen through a nasal cannula. In femur fracture patients who had pain, lumbar plexus block (anterior or posterior) was performed with HNS 12 neurostimulator, A50 needle with 2% lidocaine with 20 ml epinephrine and 20 ml 0.5% levobupivacaine, before surgery in the ward or pre-anesthesia room. In patients undergoing hip arthroplasty, analgesia was performed by blocking the lumbar plexus (anterior or posterior) with neurostimulation, A100 needle, and injection of 0.25% levobupivacaine 40 ml. In this study, only the duration of analgesia was evaluated.

The following items were evaluated: preoperative fasting time, evaluation of thirst and hunger upon arrival in the operating room, time of CHO administration in the PACU, time of reintroduction of oral feeding in the ward, and at this moment, the degree of satisfaction with the anesthetic conduct, abbreviation of fasting and early feeding. A satisfaction assessment was performed with **YES** and **NO** answers regarding the pre-anesthetic visit, the fasting abbreviation, the use of CHO in PACU, refeeding in the ward, and postoperative analgesia. Family members were also asked to return immediately to the ward, without intravenous hydration and without going through the ICU. All patients were evaluated on the conditions of hospital discharge on the second postoperative day and immediately released by the group responsible for the ACERTO project (orthopedist, geriatrician, anesthesiologist, nutritionist). However, the patient was referred to his residence through the hospital's Social Services.

Statistical analysis

Measures of central tendency and measures of dispersion of descriptive statistics. It was used as a measure of central tendency the arithmetic mean of the observed data. As a measure of dispersion, we used the standard deviation.

Results

One thousand, two hundred and twenty-six patients submitted to spinal anesthesia with fasting abbreviation were retrospectively reviewed. Of these 1,226 patients, 1,001 were selected for this study, and the remaining 225 were excluded (Figure 1). The mean±SD, as well as the minimum and maximum values for age, weight, height, gender, and physical status of the ASA, are shown in Table 1. None of the 1,001 patients reported being thirsty when they arrived in the operating room (OR), against only 26 (2.6%) reporting being hungry, which happened around 4 hours after fasting abbreviation.

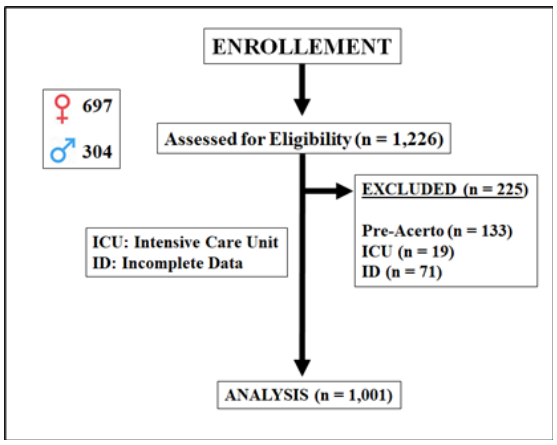

Figure 1 Consort Flow Diagram.

Table 1 Anthropometric data (mean±SD)

Variables	Results
Age (years)	79.90±11.62
(min-max)	(60-108)
Weight (kg)	62.93±11.34
(min-max)	(34-93)
Height (cm)	158.37±9.49
(min-max)	(135-189
Gender: F / M	696 / 304
ASA Physical: 1/2/3	61 / 844 / 96

The evaluation of the various times studied and their minimum and maximum values are shown in Table 2. All patients had the abbreviation between 1:20 hours and 4:00 hours, slightly exceeding the protocol between 2 and 4 hours. The time of administration of dextrinomaltose in PACU ranged from 20 minutes to 5:45 hours, as this introduction depended on the time of end of the spinal anesthesia block. Likewise, the reintroduction of oral feeding in the ward ranged from 4:00 hours to 8:15 hours, depending on the duration of spinal anesthesia and the length of stay in the PACU. The effect of no thirst and only 2.6% hunger in all patients was extremely important for patient satisfaction. Regarding the questions regarding satisfaction with the treatment provided by the Anesthesiology Service, in relation to the pre-anesthetic visit, the abbreviation of fasting, the use of CHO in PACU, refeeding in the ward, and postoperative analgesia, all patients said YES with care at different perioperative times. Likewise, fasting abbreviation did not cause nausea and vomiting in any patient. The satisfaction of not being transferred to the ICU and of being left without intravenous hydration was important for assessing patient satisfaction, in the opinion of family members, since all patients were over 60 years old.

Table 2 Fasting time, time of CHO administration in the PACU after surgery and oral refeeding in the ward (mean±SD)

Variables	Food
Fasting time of CHO (h:min)	2:51±0:32
(min-max)	(1:20-4:00)
PACU administration time of CHO (h:min)	1:38±0:46
(min-max)	(0:20-5:45)
Oral refeeding in the ward (h:min)	6:18±1:02
(min-max)	(4:00-8:15)

Analgesia with lumbar plexus block (anterior or posterior) with a neurostimulator before or after providing mean analgesia of 22±4 hours, with a minimum time of 13 hours and a maximum of 34 hours. This conduct allowed her to be discharged from the hospital the day after the surgery and go home without pain, increasing the degree of satisfaction of patients and family members. And for family members, the return of patients over 60 years of age increased the degree of satisfaction with living with the family. All patients were able to be discharged from the hospital on the second postoperative day. Hospital discharge depended on the Social Service and some patients stayed another day in the hospital, despite being discharged from anesthesia.

Discussion

Preoperative nocturnal fasting, *nil per os* (NPO) was instituted when anesthetic techniques were still quite rudimentary, chloroform was used at the time[8] and its main objective was to avoid respiratory complications due to vomiting and aspiration of gastric contents in obstetric patients.[9] This study with 1,001 elderly patients with hip and femur fracture clearly confirms that preoperative oral ingestion 2 to 4 hours before, 200 mL of a CHO drink (12.5% dextrin maltose) decreased thirst and hunger on the arrival at OR, resulting in greater comfort and satisfaction with anesthesia. There was no case of PONV before and in the PACU after the end of spinal anesthesia. Likewise, the introduction of oral feeding at around 6 hours in the ward was not reported on PONV. The duration of analgesia through lumbar plexus blockade (anterior or posterior) with a neurostimulator and 0.25% levobupivacaine resulted in an average of 22 hours, ranging from 13 to 34 hours, increasing patient satisfaction.

In a prospective study with 400 femur fracture patients after the implementation of the ACERTO project, the aim of determining the attitudes and awareness among health professionals involved in the treatment of these patients.[7] The results showed that improving adherence requires a continuous and dynamic process. We can be inferred that with the implementation of fast-track project in Hospital SUS, costs decreased for elderly patients with hip and femur fractures. There was a decrease in the incidence of all study parameters from 21% to 100% compared to pre-project. The anesthesiologist was the major obstacle to deployment to all patients.

Hip and femur fractures are a common injury and the leading cause of death among elderly patients, with significant mortality rates. A recent systematic review and meta-analysis, with the objective of verifying the differences in mortality, functional outcome, and costs between nonoperative management (NOM) and operative management (OM) of hip fractures in patients above 65 years, demonstrated that only a few studies with a small number of patients comparing NOM with OM were published.[10] A significantly higher 30-day and one-year mortality were revealed in nonoperatively treated hip fracture patients. Differently from this study, our group of patients over 60 years of age in the SUS with hip and femur fractures were operated on as soon as they were released for surgery, with no comparison with the non-operated group. In a previous study, there was a marked decrease in the length of stay of patients.[5] In this study of 1,001 patients, all were able to be discharged from the hospital on the second postoperative day.

In a previous study for the implementation of a project to accelerate postoperative recovery in elderly patients with hip and femur fractures, the average fasting time was 13:30 hours, with the lowest time of 9:15 hours and the biggest fasting time of 19:30 hours.[11] After implementing the ACERTO project, fasting time dropped to 2:53 hours.[7] Patient satisfaction with the significant provider of health care is considered to be an important determinant of adherence.[5] In a 2003, Cochrane systematic review involving 22 studies, it was found that there was no evidence that a shorter fasting time increased the risk of aspiration, regurgitation, or morbidity compared with a standard NPO regimen.[12] The results of this retrospective study with 1,001 elderly patients with femur and hip fractures confirm that the ingestion of 200 mL of CHO to abbreviate fasting did not increase morbidity, in the same way, that the same volume still in PACU increases patient satisfaction.

Thirst and hunger are real discomfort and generate great suffering for the patient.[13] Preoperative fasting ranged from 8 to 37 hours and

there was no association between the type of anesthesia, bleeding, fasting time, and thirst and the results of this study warn that thirst causes real suffering.[13] In our study, drinking a 200 mL drink with CHO before surgery not only reduced preoperative thirst and hunger but also provided greater patient satisfaction. The use of the same volume of the same beverage in the PACU did not cause nausea and vomiting, just as it increased satisfaction in all patients who went to the ward.

For this study, a standard carbohydrate drink (12.5% dextrin maltose) was selected for the administration of 200 ml of liquid orally preoperatively in the ward, and after the end of the effect of spinal anesthesia in PACU. This study was carried out in elderly patients with hip and femur fractures, as these patients represent a group of patients where the gastrointestinal tract is completely free, which facilitates the use of the natural route for feeding. As none of the patients had nausea and vomiting upon arrival at the OR or after CHO at the PACU, all patients were fed in the late afternoon of the day of surgery and this provided additional satisfaction for patients and families.

In a study with 188 patients classified ASA III-IV for cardiac surgery, receive 800 ml, in the evening and 400 ml 2 hours before surgery, a clear 12.5% CHO drink, compared to the control group flavored water (placebo), or to fast overnight, showed that it does not affect postoperative insulin resistance and reduce thirst.[14] And it ends that may be recommended as routine procedures for ASA physical status III-IV patients. In our study with 1,001 elderly patients, there were 96 ASA III patients, were administered 200 ml before surgery and 200 ml in PACU, without any complications.

In a review and meta-analysis conducted in 1993, psychological preparation was found to be beneficial for a range of outcome variables including pain, behavioral recovery, length of stay, and negative affect. In 2015, we showed the importance of the presence of the Psychology Service in the evaluation of elderly patients with hip and femur fractures.[5] The information provided by surgeons, anesthesiologists, and nurses about the surgical procedure, as well as better quality of postoperative analgesia, reduced anxiety and improved outcomes.[5] This study with 1,001 patients confirmed our previously published results. Thirst is a real discomfort and causes great suffering to the patient, and when thirst is intense it results in increased anxiety, dehydration, irritability, weakness, and despair.[16] In the present study, 200 ml of clear CHO administered between 1:20 and 4 hours was responsible for none of the patients complaining of thirst. However, it was insufficient to prevent hunger in 26 patients. Probably, the increase in volume and the addition of proteins can contribute to avoiding thirst and hunger.

Satisfaction is defined as a pleasant feeling caused by the fulfillment of expectations. Satisfaction is clearly a multidimensional concept and there is no single, easily understood definition that would apply to all patients.[17] The definition of quality is the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge.[18] Patient satisfaction is one of the most used measures, as shown by the increase in the number of tools created to assess satisfaction in recent years. Some authors go further by considering patient satisfaction as one of the primary results of health care.[19] Patient satisfaction questionnaires must meet, among other requirements, some psychometric properties, especially if the objective is to generalize the information to the population- target.[20] The initial satisfaction study involved administering a four-step questionnaire to 100 patients aged over 60 years, comparing NPO with 200 ml of CHO before surgery, which shows that satisfaction increased with decreasing fasting time.[5] These results allowed elderly patients with hip and femur fractures to become a continuous part of this conduct, now including the perioperative study (before, during, and after), with increased satisfaction at all stages.

The anesthesiologist's role has evolved a lot, as in addition to being concerned with providing ideal surgical conditions, they want to minimize pain immediately after the operation. Blockade of the lumbar and sacral plexuses improved postoperative analgesia in elderly patients with hip and femur fractures, reducing the side effects of opioids, and thus facilitating the rapid recovery process.[1,7,21,22] The average duration of analgesia was 22 hours, similar to other studies with the same type of surgery.

It is certain that the operation of compartmentalizing the patient is a chapter in the history of medicine that was fundamental for each of its specialties to advance. But this logic is also political, wherein the daily routine of clinics and hospitals (SUS), it reveals a social structure in which working-class subjects are subjected to the assembly line of hospitals, their shortages (material), and the violence of bureaucracy. Thus, a multidisciplinary project favors care with better outcomes for elderly patients with femoral fractures, with some resistance from some specialties.[7]

Conclusion

The main objective of this study was to continue researching patient satisfaction, which started in 2015 [**5**] with regard to perioperative care of fasting abbreviation, use of clear liquid in PACU, reintroduction of oral feeding, avoidance of ICU hospitalization, withdrawal of intravenous hydration and analgesia in elderly patients of orthopedic surgery of femur and hip. All patients interviewed stated that it is worth drinking a liquid due to the remission of thirst and hunger, reintroducing oral feeding, avoiding hospitalization in the ICU, and returning to family life. In this sense, data from this study with 1,001 patients clearly show that in hospitalized elderly, the liberal use of CHO before surgery and immediately in PACU, and better quality analgesia is an easy and practical way to increase patient comfort and satisfaction with anesthesia care and with better outcomes.

Disclosures

Name: Luiz Eduardo Imbelloni, MD, PhD.

Contribution: This author helped with study conception and design, this author helped perform background research, statistical analysis, generation of tables and figures, analysis and interpretation of data, selected all the references used for the preparation of the study, wrote the entire manuscript, and gave final approval of the manuscript.

Name: Siddharta Lacerda, MD, Robson Barbosa, MD, Márcio Duarte, MD, Bruno Brasileiro, MD, Thaís Bezerra Ventura, MD

Contribution: This author selected the patients' in pre-anesthetic visits, performed spinal and lumbar plexus blocks, postanesthetic follow-up, drafted portions of the manuscript, and gave final approval of the manuscript.

Name: Geraldo Borges de Morais Filho, MSc.

Contribution: This author performed statistical analysis, generation of tables, analysis, and interpretation of data, revised the manuscript critically for intellectual content, and gave final approval of the manuscript.

Key points

- **Question**: A retrospective study with 1,001 elderly patients with femur and hip fractures was evaluated using an Excel spreadsheet filled out over the years, whether the abbreviation of fasting, CHO intake in PACU, reintroduction of oral food in the ward, not going for ICU, withdrawal of intravenous hydration and analgesia interferes with patient and family satisfaction.
- **Findings**: All patients had the fasting abbreviation between 1:20 h and 4:00 h. On arrival in OR, none were thirsty, and 26 were hungry. Administration of CHO in PACU ranged from 20 minutes to 5:45 h. Reintroduction of oral feeding in the ward ranged from 4 h to 8:15 h. Analgesia ranged from 13 h to a maximum of 34 h, with an average of 22 h.
- **Meaning**: All these conduct increase patient comfort and satisfaction with anesthesia care and with better outcomes.

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