

A Abreviação do Jejum Pré-Operatório para Duas Horas com Carboidratos Aumenta o Risco Anestésico? *

Does Abbreviation of Preoperative Fasting to Two Hours with Carbohydrates Increase the Anesthetic Risk?*

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RESUMO

Oliveira KGB, Balsan M, Oliveira SS, Aguiar-Nascimento JE - A Abreviação do Jejum Pré-Operatório para Duas Horas com Carboidratos Aumenta o Risco Anestésico?

JUSTIFICATIVA E OBJETIVOS: O objetivo do presente estudo foi avaliar o surgimento de possíveis complicações anestésicas relacionadas à abreviação do jejum pré-operatório para duas horas com uma solução contendo dextrinomaltose a 12,5% dentro do projeto ACERTO (Aceleração da Recuperação Total Pós-operatória).

MÉTODOS: Foram avaliados prospectivamente todos os pacientes submetidos a diversas operações sobre o trato digestivo e parede abdominal dentro de um novo protocolo de condutas perioperatórias estabelecidas pelo projeto ACERTO entre agosto de 2005 e dezembro de 2007. Todos receberam o suplemento nutricional (dextrinomaltose a 12,5%) por via oral seis e duas horas antes do procedimento cirúrgico. A coleta de dados foi prospectiva sem o conhecimento dos profissionais do serviço. Observou-se o tempo de jejum pré-operatório e as complicações anestésicas relacionadas ao curto tempo de jejum (broncoaspiração).

RESULTADOS: Foram avaliados 375 pacientes, sendo 174 homens (46,4%) e 201 mulheres (53,6%) entre 18 e 90 anos de idade. O tempo médio de jejum pré-operatório foi de quatro horas variando de duas a 20 horas. Não houve nenhum caso de broncoaspiração durante os procedimentos. O tempo de jejum foi maior ($p < 0,01$) quando se praticou procedimento anestésico associado (bloqueio + geral).

CONCLUSÕES: A adoção das medidas multidisciplinares perioperatórias do projeto ACERTO não trouxe nenhuma complicação re-

lacionada ao jejum pré-operatório. A dextrinomaltose é suplemento nutricional útil e seguro para o paciente.

Unitermos: ANESTESIA: preparo pré-operatório; COMPLICAÇÕES: aspiração de conteúdo gástrico; JEJUM: tempo.

SUMMARY

Oliveira KGB, Balsan M, Oliveira SS, Aguiar-Nascimento JE – Does Abbreviation of Preoperative Fasting to Two Hours with Carbohydrates Increase the Anesthetic Risk?

BACKGROUND AND OBJECTIVES: The objective of the present study was to evaluate the incidence of possible anesthetic complications related with the abbreviation of preoperative fasting to two hours with a solution of 12.5% dextrinomaltose within the ACERTO (from the Portuguese for Acceleration of Total Postoperative Recovery) project.

METHODS: All patients undergoing different types of digestive tract and abdominal wall surgeries within a new protocol of perioperative conducts, established by the ACERTO project, between August 2005 and December 2007 were evaluated. All patients received oral nutritional supplementation (12.5% dextrinomaltose) six and two hours before the procedure. Data were collected prospectively without the knowledge of the professionals in the department. The length of preoperative fasting and anesthetic complications related with the short fasting time (pulmonary aspiration) were recorded.

RESULTS: Three hundred and seventy five patients, 174 male (46.4%) and 201 female (53.6%), ages 18 to 90 years, were evaluated. The mean preoperative fasting time was four hours, ranging from two to 20 hours. Pulmonary aspiration was not observed during the procedures. The length of fasting was longer ($p < 0.01$) when combined anesthesia (blockade + general) was used.

CONCLUSIONS: Adopting the multidisciplinary preoperative measures of the ACERTO project was not associated with any preoperative fasting-associated complications. Dextrinomaltose is a useful and safe nutritional supplement for the patient.

Keywords: ANESTHESIA: preoperative care; COMPLICATIONS: aspiration of gastric contents; FASTING: time.

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INTRODUCTION

The anesthetic management of patients undergoing surgeries of the digestive system allows the implementation of a wide variety of techniques. In any of them, adequate preoperative fasting implies the reduction in the number of complications directly related with a full stomach.

Nocturnal preoperative fasting was instituted when anesthetic techniques were rudimentary, to prevent pulmonary complications associated with vomiting and aspiration of gastric contents. The reason for it is to guarantee gastric emptying and, therefore, to avoid pulmonary aspiration at the moment of anesthetic induction. A review of textbooks published in the last century shows that the dogma of the eight to 12-hour preoperative fasting was instituted based on the reports of pulmonary aspiration during anesthetic induction for urgent and emergency surgeries. This concept was broadened to include elective surgeries based on another study published in the 1950s that defined a maximal limit of 25 mL of gastric contents to guarantee the lack of risk of bronchial aspiration during anesthetic induction².

Around the 1980s, when preoperative fasting began to be questioned, it was already known that gastric emptying of low calorie liquids without residues was fast³. With the advent of Evidence Based Medicine prospective and randomized studies showed, repeatedly, that preoperative fasting from carbohydrate-containing fluids could be reduced to two hours since it was not associated with the risk of aspiration³⁻⁵. A systematic review by Cochrane confirmed those results⁶. Besides, it was demonstrated that the gastric residue after conventional fasting is similar to that of the two-hour fasting from clear liquids.

Thus, in 2005, a project to accelerate postoperative recovery of patients undergoing abdominal surgeries – the ACERTO project (from the Portuguese for Acceleration of Total Post

operative Recovery) was developed in the Surgery Department of the Medical Sciences School of the Universidade Federal of Mato Grosso (UFMT)^{7,8}. This is a set of multidisciplinary perioperative measures involving the General Surgery, Anesthesiology, Nutrition, Nursing, and Physical Therapy Departments. The initial results were satisfactory and, nowadays, the routine of the hospital is based on this protocol⁷.

The objective of this study was to evaluate the safety of using nutritional supplementation (used in the ACERTO protocol) two hours before abdominal surgeries and the incidence of anesthetic complications associated with the preoperative fasting at the Hospital Universitário Júlio Muller.

METHODS

After approval by the Ethics Committee of the hospital, all patients undergoing elective abdominal surgeries (laparotomies with interventions in organs of the digestive system and surgeries of the abdominal wall) at the Department of General Surgery of the Hospital Universitário of UFMT, between August 2005 and December 2007, who were included in a new protocol of perioperative conducts of the ACERTO project were evaluated prospectively. Chart I shows the set of measures established by the ACERTO project and conventional procedures used before its implementation.

All patients observed a regular diet until eight hours before the surgery. According to the ACERTO protocol, patients received in the preoperative period nutritional supplementation composed of 400 mL and 200 mL of 12.5% dextrin-maltose (Nidex[®], Nestlé, São Paulo, Brazil) six and two hours before the surgery, respectively. Diabetic patients cleared for surgery were not excluded from the protocol.

All patients received pre-anesthetic medication, such as oral midazolam 7.5 or 15 mg, according to the individual evaluation 30 minutes before being transferred to the operating room. All patients undergoing neuroaxis block as the only anesthetic technique were sedated with midazolam and fentanyl in appropriate doses to maintain them at Ramsay four. Patients undergoing the combined technique (neuroaxis block and general anesthesia) were sedated with midazolam and fentanyl at doses to maintain Ramsay three or four for the blockade, before induction of general anesthesia. The conventional method was used for induction of general anesthesia, observing the age, associated pathologies, and physical status ASA of the patient before deciding to use propofol or etomidate as the hypnotic drug. Predicted surgical time, co-morbidities, the association with neuroaxis block, and prior evaluation of the airways, determined the choice between fentanyl and alfentanil and the dose used for anesthetic induction and maintenance. The predicted surgical time, presence of associated diseases, age of the patient, and predictive evaluation of the airways, determined the choice of neuromuscular blocker used. Rapid sequence induction or awake intubation was not used. Prophylaxis of

postoperative nausea and vomiting varied, but the medications were administered after the blockade and/or anesthetic induction.

The presence of regurgitation of gastric contents during anesthetic induction, before or after intubation, was the main parameter. Postoperative vomiting was not recorded. The real preoperative fasting time was recorded to compare it with the prescribed fasting time. According to the ACERTO protocol,

Chart 1 – Conducts in Abdominal Surgeries Used in the General Surgery Ward of HJUM before and After the Implementation of the ACERTO Project⁷

<p>Conventional conduct</p> <ul style="list-style-type: none"> • Preoperative fasting of at least eight hours (since the night before the surgery). • Introduction of postoperative diet after the elimination of gases or stool (absence of ileus). • Postoperative intravenous hydration at 40 mL.kg⁻¹ • Systematic mechanical colonic preparation with serial rectal enemas with mannitol or fosfosoda for colorectal surgeries. • Signing of an informed consent • Use of surgical drains, tubes, and antibiotics according to the preferences of the surgeon. • Early postoperative mobilization of the patient. <p>Recommended conducts of the ACERTO project</p> <ul style="list-style-type: none"> • Prolonged preoperative fasting is not allowed. Carbohydrate-rich liquid diet is indicated until the day before the surgery, and it can be administered up to two hours before the surgery. Exceptions: morbidly obese patients, significant gastroesophageal reflux, and pyloric stenosis. • In biliary tract surgeries and herniorrhaphy and similar surgeries, oral liquid diet on the same day of the surgery is allowed (six to 12 hours after the surgery). In surgeries with anastomosis of the digestive tract, diet should be instituted on the first postoperative day (liquid diet), or even on the same day of the surgery. In surgeries with esophageal anastomosis, diet through the jejunostomy or nasogastric tube on the first postoperative day. • Intravenous hydration should not be prescribed on the immediate postoperative period of herniorrhaphies. Intravenous hydration should be discontinued 12 hours after cholecystectomies, but for exceptional cases. Except when not indicated, volume supplementation of no more than 30 mL.kg⁻¹.day until the first postoperative day. • Preoperative colon preparation should not be routinely done for colorectal surgeries. • The patient should sign an informed consent and detailed information on the surgery should be given to the patient. • The use of surgical drains and gastric tubes should not be routinely done. Rational and standardized use of antibiotics. • Before the surgery, give the patient detailed information on the procedure, encouraging early postoperative ambulation and diet. • Very early ambulation: the patient should walk or sit for at least two hours on the same day of the surgery. The following days, stimulate the patient to spend six hours out of the bed.
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patients with morbid obesity, symptomatic gastroesophageal reflux, pyloric stenosis, gastroparesis, or with the diagnosis of gastroesophageal reflux were excluded from the abbreviation of preoperative fasting protocol.

RESULTS

During the study period, 375 surgeries were performed in patients included in the ACERTO protocol who received nutritional supplement with 12.5% dextrinomaltose before the surgery (laparotomy with intervention in organs of the digestive system or surgeries of the abdominal wall). Table I shows the clinical and demographic characterization of patients included in the study. Table II shows the type and number of surgeries performed during the study.

The time between the last nutritional supplementation and the beginning of the anesthetic procedure ranged from two to 20 hours, with a median of four hours and mode of three hours. Complications related with the preoperative fasting were not observed.

Cases of regurgitation during anesthetic induction or any other anesthetic complication related with the abbreviation of

Table I – Clinical and Demographic Characterization of Patients

	Distribution of cases (n = 375)
Gender	
Male	174 (46.4%)
Female	201 (53.6%)
Age (years)	46 (18-84)
Duration of the surgeries (minutes)	120 (25-600)

Table II – Surgeries Performed During the Study Period

Surgery	Number
Esophageal	10
Gastric	24
Biliary tract	11
Exploratory laparotomy	17
Small bowel	08
Large bowel	28
Herniorrhaphy	110
Cholecystectomy	130
Pancreas	5
Miscellaneous	32
Total	375

Table III – Case Distribution According to the Type of Anesthesia in Relation to the Length of Preoperative Fasting

Type of anesthesia	Length of fasting (hours)	Number of cases (%)
Regional block	4 (2 - 19)	183 (48.8)
General	4.5 (2.5 - 19)	52 (13.9)
Regional block + General	5 (2 - 20) *	140 (37.3)
Total	4 (2 - 20)	375

Data expressed as median and variation

* = $p < 0.01$ vs. Regional Block

the preoperative fasting to two hours from clear liquids were not observed during the procedures.

Table III shows the types of anesthesia in relation to the preoperative fasting. A predominance of regional blocks, followed by combined anesthesia, was observed. Fasting time was significantly longer in combined anesthesia than in simple regional block.

DISCUSSION

In the last decades, several studies have shown promising results with the use of multimodal programs to optimize postoperative recovery⁹. The results of consistent clinical studies have raised questions about old paradigms that have been replaced by modern, evidence-based procedures^{6,8}.

Such considerations stimulated some societies to adopt preoperative fasting shorter than eight hours. The American Society of Anesthesiologists (ASA)¹⁰ recommends fasting from clear liquids for at least two hours before surgeries. Clear liquids include: water, coffee (black), tea, carbonated beverages, and juices without pulp. Light meals with toast, and tea or coffee (black) are allowed up to six hours before the surgery. Solid foods, especially meat and fatty meals, require a more prolonged fasting. Those foodstuffs are not allowed on the day of the surgery¹¹. Patients scheduled for surgeries in the morning (after six o'clock) are instructed to fast from solids from 10 p.m. on the night before the surgery, which corresponds to a fasting period longer than eight hours. Small amounts of water with the pre-anesthetic medication or other oral medications are allowed^{10,11}.

Although the two-hour fasting from clear liquids is recommended, only a few services follow it. The results of the present study showed that it was possible to reduce preoperative fasting from nutritional supplementation without reducing the safety of the anesthetic procedure.

Prolonged preoperative fasting commonly for eight hours has been practiced since the introduction of anesthesia in 1840. This was done to guarantee gastric emptying and prevent pulmonary aspiration during anesthetic induction. However, this conduct was changed a long time ago because

the evidence that the reduction of fasting from clear liquids increasing the risk of pulmonary aspiration or morbidity when compared to the conventional regimen does not exist^{1,6,12}. One should not forget that conventional fasting time is often increased due to a delay in the surgery and change in the time of the surgery, among other causes. This can increase fasting time of up to 16 hours^{7,8}. The relationship between fasting and the type of anesthesia is another important factor. Fasting was a mean of one hour longer in combined anesthesia. This was probably due to the time necessary for the combined anesthetic technique.

Studies have demonstrated that prolonged fasting results in greater residual gastric volume with more acid pH, while ingestion of clear fluids up to two hours before the procedure decreases the residual volume and increases the pH¹²⁻¹⁴. Besides, prolonged preoperative fasting is not only uncomfortable and unnecessary, but it can also be harmful by potentiating or perpetuating the organic response to trauma^{1,12}. Currently, anesthesia societies recommend more liberal rules regarding preoperative fasting, allowing the ingestion of clear liquids up to two hours before surgery^{10,12}.

Among patients at risk for pulmonary aspiration of gastric contents, those with gastroesophageal reflux deserve additional care¹³. For this reason, those patients were excluded from the abbreviation of preoperative fasting protocol. However, at least in children who ingested clear liquids two hours before surgery, residual gastric volume was not increased in patients with gastroesophageal reflux¹³.

Recent studies indicate that the use of a carbohydrate-rich liquid solution increases patient satisfaction, decreases irritability and the incidence of vomiting, increases the pH, improves gastric emptying, and reduces the organic response to surgical stress¹⁴⁻¹⁶. Maltby¹, in an extensive review on preoperative fasting, reported several randomized studies demonstrating that the residual gastric volume after fasting for 12-16 hours is similar to that after fasting for two to three hours. Thus, the introduction of this routine in the preoperative care of our patients, with the administration of a carbohydrate solution (12.5% dextrinomaltose – 231 mOsm.L⁻¹) two hours before the surgery, was an evidence-based decision.

Diabetic patients were not excluded from the study and were submitted to the same routine of abbreviation of preoperative fasting. We were supported by the correlation between the policy adopted and the proposal of the study: prolonged fasting is an important complicating factor in diabetics; clear liquids improved gastric emptying and, therefore, decrease residual gastric volume¹⁵⁻¹⁷. Further studies with this group of patients are necessary to support our evidence;

Abbreviation of the preoperative fasting from dextrinomaltose did not cause any cases of regurgitation of gastric contents during anesthetic induction. The real fasting time was greater than that prescribed, and it was greater when combined anesthesia (regional blockade + general) was used. Finally, the results of the present study allow the conclusion that abbreviation of preoperative fasting is safe.

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RESUMEN

Oliveira KGB, Balsan M, Oliveira SS, Aguilar-Nascimento JE - ¿La Reducción del Ayuno Preoperatorio en dos Horas con Carbohidratos Aumenta el Riesgo Anestésico?

JUSTIFICATIVA Y OBJETIVOS: *El objetivo del presente estudio, fue evaluar el surgimiento de posibles complicaciones anestésicas relacionadas con la reducción del ayuno preoperatorio en dos horas con una solución que contiene dextrinomaltoza a 12,5% dentro del proyecto ACERTO (Aceleración de la Recuperación Total Postoperatoria).*

MÉTODO: *Se evaluaron de forma prospectiva, todos los pacientes sometidos a diversas operaciones sobre el tracto digestivo y la pared abdominal, dentro de un nuevo protocolo de conductas perioperatorias establecidas por el proyecto ACERTO, entre agosto de 2005 y diciembre de 2007. Todos recibieron el suplemento nutricional (dextrinomaltoza a 12,5%) por vía oral seis y dos horas antes del procedimiento quirúrgico. La recolección de datos fue prospectiva sin que los profesionales del servicio lo supieran. Se observó el tiempo de ayuno preoperatorio y las complicaciones anestésicas relacionadas con el corto tiempo de ayuno (broncoaspiración).*

RESULTADOS: *Se evaluaron 375 pacientes, siendo de ellos 174 hombres (un 46,4%) y 201 mujeres (un 53,6%), entre 18 y 90 años de edad. El tiempo promedio de ayuno preoperatorio fue de cuatro horas, variando de 2 a 20 horas. No se registró ningún caso de broncoaspiración durante los procedimientos. El tiempo de ayuno fue mayor ($p < 0,01$) cuando se practicó el procedimiento anestésico asociado (bloqueo + general).*

CONCLUSIONES: *La adopción de las medidas multidisciplinarias perioperatorias del proyecto ACERTO, no conllevó a ninguna complicación relacionada con el ayuno preoperatorio. La dextrinomaltoza es el suplemento nutricional más útil y seguro para el paciente.*