

# Perioperative care in bariatric surgery in the context of the ACERTO project: reality versus surgeons assumptions in a Cuiabá hospital

## *Cuidados perioperatórios em cirurgia bariátrica no contexto do projeto ACERTO: realidade e o imaginário de cirurgões em um hospital de Cuiabá*

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### ABSTRACT

**Objective:** to assess the level of knowledge among bariatric surgeons, about the recommendations of the ACERTO Project, correlating their assumptions on their perioperative prescriptions and the reality, according to the patients charts. **Method:** we conducted a prospective, longitudinal, observational study comparing the assumptions of bariatric surgeons obtained through responses on a specific questionnaire with the reality found in clinical data from the hospital records. We analyzed the following variables: preoperative fasting, early postoperative feeding, intravenous hydration, perioperative antibiotic prophylaxis, use of abdominal drains, type of analgesia, and prophylaxis of nausea and vomiting. We confronted the responses of seven surgeons with data from 200 records of patients undergoing gastroplasty for morbid obesity. **Results:** all interviewed surgeons knew the ACERTO Project. Five (72%) responded that they followed the protocol thoroughly. The median time of preoperative fasting found in the records was higher than the reported by the surgeons ( $p < 0.05$ ). Early postoperative feeding was prescribed for 96.5% of cases. The median volume of intravenous fluids prescribed in the first 24 hours was 4000ml, which was consistent with the interviews. There were no differences between the response in the questionnaire and the findings in the hospital records in relation to antibiotic prophylaxis, use of catheters and drains, analgesia and prophylaxis of nausea and vomiting. **Conclusion:** the ACERTO Project was well practiced among the surveyed surgeons. There was a good correlation between their assumptions and the reality in perioperative care of patients undergoing bariatric surgery. However, there was a significant difference in preoperative fasting time.

**Keywords:** Bariatric Surgery. Postoperative Care. Intraoperative Care. Evidence-Based Medicine.

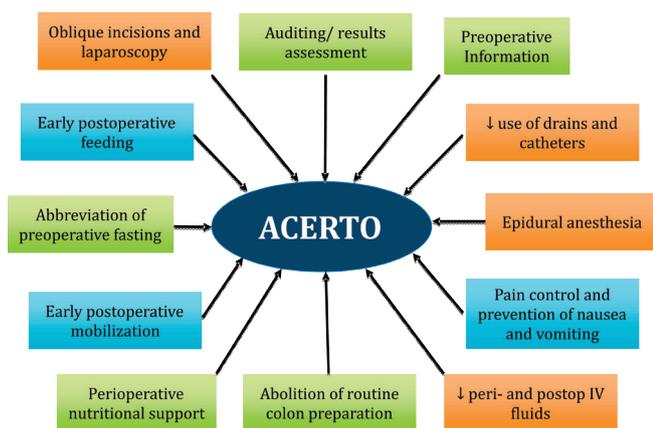
### INTRODUCTION

Evidence-based medicine (EBM) translates into the practice of medicine in a context of clinical and integrated experience, with the ability to critically analyze and apply scientific information in a rational way, with the aim of improving the quality of medical care<sup>1,2</sup>. In this context, translational medicine is a discipline that studies how to accelerate the discoveries of medicine in the laboratory and clinical fields in fast application of medical practice to improve medical or surgical treatment results<sup>3</sup>. According to Lean *et al.*<sup>4</sup>, it is a process that starts from EBM towards sustainable solutions to community health problems. Evidence-based protocols and guidelines are mechanisms that should be implemented in the medical routine, since they reduce morbidity and mortality<sup>5</sup>. Standardization of clinical practice,

making it safer, is a challenge, since physicians often do not apply it<sup>6,7</sup>.

The ACERTO Project (Portuguese acronym for Total Postoperative Recovery Acceleration)<sup>8</sup> is an educational multimodal protocol (Figure 1) designed to accelerate patients' postoperative recovery, based on the ERAS (Enhanced Recovery After Surgery)<sup>9</sup> European program already existing and grounded in the EBM paradigm. Although the ACERTO Project has been widely disseminated for ten years, there is a need for data on its incorporation into perioperative care routines. It is believed that there is a mismatch between what one assumes to have prescribe and what is prescribed, that is, between the "real" and the "imaginary". The preoperative fasting time, for example, may be greater in audits than one might imagine from the medical prescription in Brazil<sup>10</sup>. Several factors

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**Figure 1.** Main conducts addressed in the ACERTO Project.

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may contribute to the fact that the recommended guidelines are not actually performed.

At present, the number of surgical procedures for morbid obesity has increased significantly. These are procedures involving resections and anastomoses of the stomach and small intestine. The use of the ACERTO Project<sup>11</sup> or the ERAS protocol<sup>12</sup> has shown that they are safe in bariatric surgery and can reduce hospitalization time. Recently, a new guideline of the ERAS has recommended the application of the multimodal protocol in this type of procedure<sup>13</sup>. This study is important as it investigates the use of the routines of the ACERTO project between surgeons who perform bariatric surgery. Thus, the objective of this study was to verify the degree of knowledge among bariatric surgeons about the recommendations of the ACERTO Project, correlating their assumptions about their prescriptions and what really occurred through patients' records.

## METHODS

The study was approved by the Ethics in Research Committee of the Júlio Muller University Hospital, according to protocol number 031470/2016. It is a prospective, longitudinal, observational study, using the medical questionnaire and analysis of prospective clinical data of patients' charts submitted to bariatric laparoscopic procedures. We collected the data until the day of patients' discharge.

We interviewed seven surgeons with a structured questionnaire (Table 1) and gathered clinical data from medical records of 200 consecutive patients, aged between 18 and 70 years, of both genders, operated at the São Mateus Hospital and Maternity (HMSM), a private service in Cuiabá, MT, from May 1 to July 1, 2016. Data collection was authorized by the HMSM ethics committee. All patients underwent general anesthesia and were submitted to the Roux-en-Y vertical gastric bypass technique. We excluded patients who underwent open surgery, reoperations, and procedures with severe intraoperative complications, such as cardiac arrest, irreversible shock and severe intraoperative bleeding.

The variables analyzed were preoperative fasting time, early postoperative feeding, perioperative venous hydration volume, antibiotic prophylaxis, use of catheters and drains, analgesia and prophylaxis of postoperative (PO) nausea and vomiting. To estimate the preoperative fasting time, in the immediate postoperative period or on the first postoperative day, we asked all patients how long their fast lasted before the onset of anesthesia. We defined as "assumption" the perception gathered from the response of the interviewed surgeons about their conduct in perioperative care, and "reality", the data found in the medical records on these same conducts. We then correlated the answers to the medical questionnaire (assumptions) with the medical records' data (reality).

We grouped and entered the data into spreadsheets using the EXCEL® 365 software and later exported them for the SPSS 17.0 program for descriptive and analytical analysis. We used the non-parametric Mann-Whitney test for comparisons of continuous or ordinal variables, considering a significance level of 5%. We expressed continuous data as mean and standard deviation or median and inter-quartile range.

## RESULTS

All the surgeons were male, with a mean age of 42 years (36 to 55) and 18 years (12 to 32) average training after graduation. All of them attended Medical

**Table 1.** Medical questionnaire items and the data file.

Medical questionnaire	Chart data collection sheet
Time of preoperative fasting commonly prescribed for solids and liquids?	Preoperative fasting time observed for solids and liquids
How and when to prescribe postoperative feeding?	Date (day of PO) on which feeding initiated
Which crystalloid fluid prescribes in post-op?	Crystalloid fluid that was prescribed in the PO
Which volume prescribes per day and when suspends it?	Prescribed volume Days of intravenous hydration in PO
Prescribes prophylactic antibiotic? (which?)	Antibiotic
Knows and uses the CCIH Protocol?	Time of antibiotic regimen start Antibiotic usage time in PO
Uses nasogastric and bladder catheter and abdominal drains?	Use of drains and nasogastric and bladder catheter
Which drug prescribes for analgesia?	Medication used for analgesia in PO
Prescribes prophylaxis for nausea and vomiting? Which medication?	Medication used for prophylaxis of nausea and vomiting
Knows the ACERTO project?	Note on the use of the routines of the ACERTO Protocol in PO prescriptions
Uses the ACERTTO project partially or totally?	

Residency in General Surgery and six had a Specialist Degree issued by some surgical society in Brazil. Among them, two (28%) reported that they used the ACERTO protocol partially, and five (72%), fully.

Regarding the analysis of the medical records (n=200), no deaths were recorded. Of the total, 187 patients (93.5%) were discharged on the first postoperative day. Twelve patients were discharged on the second postoperative day and one patient presented lobar pneumonia, remaining hospitalized for seven days for antibiotic therapy, without abdominal complications.

### Preoperative fasting and early feeding

Five surgeons responded that they advised their patients to remain on an eight-hour fasting for solid foods. Regarding fasting for fluids, all said they recommended on average three hours before the procedure. No surgeon said to prescribe carbohydrate

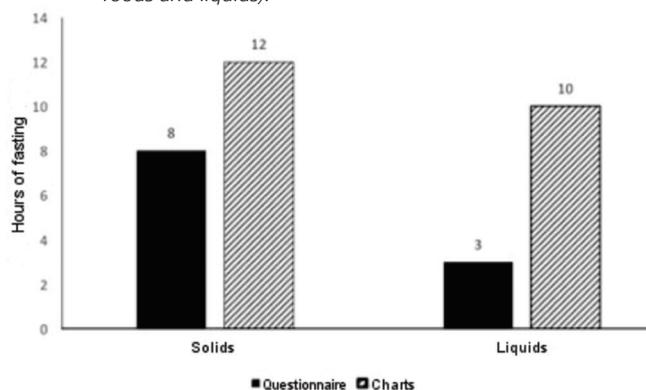
drinks two to three hours before surgery. All responded that they early refed their patients, on average eight hours postoperatively.

However, in the medical records we observed that the median time of preoperative fasting was 12 hours (eight to 21) for solid foods and ten hours (two to 18) for clear liquids. Only 23 cases (11.5%) were operated on with preoperative fasting for clear liquids less than six hours. Postoperative feeding occurred in 96.5% (n=193) of cases in the first 24 hours. In six cases (3%), the diet was prescribed on the first postoperative day and in one (0.5%) case on the second. Figure 2 shows the comparison of data from the medical records and the questionnaire regarding preoperative fasting.

### Perioperative intravenous fluids

According to the questionnaire, the fluid used by all surgeons in the postoperative period

**Figure 2.** Average time of fasting for solids and liquids ( $p < 0.05$  to solid foods and liquids).



$p < 0.05$  in both comparisons between the questionnaire and medical charts, for both solid and liquid foods.

was the combination of 5% glucose and saline. The charts revealed that this combination was the most commonly used intravenous fluid (190 cases, 95%), followed by saline (seven cases, 3.5%) and lactated ringer (two cases, 1%). One patient (0.5%) received only 5% glucose.

Patients received a median of 1,000 ml (500-4,000) intraoperatively. In the immediate postoperative period, surgeons prescribed a median of 4,000ml (1,000 to 7,000). Only thirteen patients (6.5%) received intravenous fluids on the first postoperative day, with a median of 3,000ml (1,000 to 4,000). Only one patient received 1,500ml of crystalloid fluid on the second postoperative day.

Surgeons reported having prescribed a median of 3,000ml (2,500 to 4,000 ml) per day in the immediate postoperative period. Regarding the criteria for the suspension of venous hydration: 58% ( $n=4$ ) reported discontinuation on discharge, 14% ( $n=1$ ) used maintenance hydration (while the patient was taking intravenous medications) and 28% suspended

the serum when they offered solid foods to patients. Table 2 shows the comparison of the assumed intravenous fluid prescription and the reality observed in 200 hospital records. Only 3.5% and 0.5% of the patients received intravenous fluids on the first and second PO days, respectively.

In the statistical analysis, we observed a significant difference ( $p=0.01$ ) between the amount described above and the amount observed in the medical record for fluid prescribing in the immediate postoperative period (Figure 3). Three surgeons (42.8%) reported not to prescribe intravenous fluids on the first postoperative day and the remainder admitted to prescribe an amount of fluid between 1,500 and 3,500 ml. Only one surgeon reported prescribing fluids on the second postoperative day (3,000ml).

### Antibiotic prophylaxis

All surgeons answered that they use antibiotic prophylaxis, and cefazolin is the antibiotic of choice, as recommended by the Hospital Infection Control Committee (CCIH). Five surgeons kept the antibiotic for 24 hours, and the other two for 48 hours. Four surgeons were familiar with the CCIH protocol of the hospital where they work (58%), and reported to use it, while three (42%) said they did not know.

Data from the medical records revealed that 199 patients (99.5%) received antibiotic prophylaxis at the time of anesthetic induction and one in the immediate postoperative period (0.5%). The majority of cases (196, 98%) received antibiotics for 24 hours, three (1.5%), for 48 hours and one (0.5%), for more than 48 hours. The most commonly prescribed

**Table 2.** Median volume of IV fluids prescribed in the PO ( $p=0.01$  between questionnaire and medical charts).

Postoperative day	Medical questionnaire Median and variation (ml/day)	Patients' charts Median and variation (ml/day)
Immediate PO	3,000 (2,500-4,000)	4,000 (1,000-7,000)
1 <sup>st</sup> PO day	1,500 (0-3,500)*	0 (0-4,000)**
2 <sup>nd</sup> PO day	0 (0-3,000) #	0 (0-1,500) ##

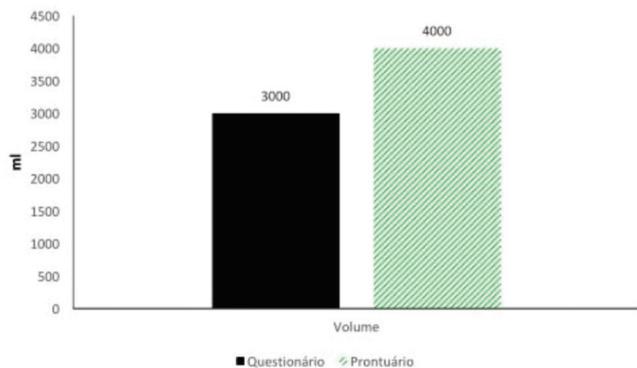
\* Three surgeons responded that did not prescribed IV fluids in first PO.

\*\* 187 patients did not receive fluids in the first PO day. Only seven (3.5%) cases were given fluids ranging from 1,000 to 4,000 ml/day.

# Only one surgeon reported prescribing fluids in the second PO day. Others reported that the patient would already be discharged, without IV fluids.

## Only one (0.5%) patients received 1,500ml in second PO day. The remaining 199 (99.5%) were discharged and did not receive IV fluids.

**Figure 3.** Median volume of intravenous fluids in the immediate PO ( $p=0.01$  for the comparison of the questionnaire and medical charts).



antibiotic was cefazolin (197 cases, 98.5%). One patient (0.5%) received ciprofloxacin and two (1%) received ceftriaxone.

### Abdominal drains, nasogastric catheter and bladder catheter

Most surgeons (72%) said they never use abdominal drains in this type of operation. In contrast, 28% reported the rare use of abdominal drains, in cases of reoperations due to complications. In these situations, the drain chosen by the surgeons in the questionnaire was that of Blake. No surgeon routinely used nasogastric and bladder catheters. The review of medical records found that no patient had a nasogastric or bladder catheter after the end of surgery. Four (2%) patients had the insertion of a Blake drain.

### Prophylaxis of nausea and vomiting and postoperative analgesia

All surgeons reported that they use dipyrone and tramadol in combination with anti-inflammatory drugs: five (72%) use ketoprofen, and two (28%), tenoxicam. Regarding prophylaxis of nausea and vomiting, 86% (six surgeons) said they prescribed, five (72%) used ondansetron and one (14%) used dimenhydrin. In the medical records, all patients received analgesic medication, dipyrone and tramadol being the most frequent (195 cases, 97.5%), followed by dipyrone alone in five (2.5%) cases. One hundred and ninety-six patients (98%) received prophylaxis of nausea and vomiting, 194 patients ondansetron and two, dimenhydrin.

## DISCUSSION

We achieved the objectives drawn to answer the project question. The findings showed that all surgeons in the service knew the foundations of the ACERTO Project and applied them partially or totally. In addition, there was a high percentage of agreement between the surgeons' assumptions and the reality of medical records. These postoperative results were adequate to the concept of acceleration of the postoperative recovery contained in the multimodal protocols, with a reduced number of hospitalization days, no mortality and low postoperative morbidity. These considerations are quite relevant, since bariatric surgery involves gastrointestinal resections and anastomosis.

Traditionally, patients with gastric resection followed by anastomosis have received excessive volume of intravenous infusion for several days<sup>14</sup>. In bariatric surgery, this excessive volume is prescribed because of the fear of rhabdomyolysis<sup>15</sup>. There are indications in the literature of aggressive hydration in Bariatric patients starting at the anesthetic act, with volume ranging from four to five liters of crystalloid fluids for two to three hours of operation<sup>16</sup>. However, in a comparative study in the obese patient, the adoption of a more restricted regime (15ml/kg versus 40ml/kg) showed no difference in the incidence of postoperative rhabdomyolysis<sup>17</sup>. Boldt<sup>18</sup>, in 2006, published a review of venous hydration regimens in the postoperative period of abdominal surgery and concluded that patients undergoing postoperative restraint fluid therapy had fewer cardiovascular and pulmonary complications and postoperative ileus. Our results showed that the interviewed surgeons assimilated the concept of a more restricted fluid therapy defended by the Project in Bariatric Surgery<sup>11</sup>, which reflected in the observations of the 200 procedures performed. There was little disagreement between the assumed and the injected volume. In general, as for the population of obese patients, the prescribed volume, and mainly the number of days in intravenous fluid therapy, were adequate and within the recommendations of the ACERTO protocol. This

scenario was observed not only by the surgeons in the postoperative period, but also by the anesthesiologists during the perioperative one, since the mean fluids were 1,000 ml per operation. This probably reflects the improved education of the HMSM anesthetic team, which for many years has been accompanying and implanting the ACERTO Project in Brazil. Many of the anesthesiologists in this group are authors of chapters and scientific articles in national and international journals<sup>19,20</sup>. However, there was still a preference of surgeons for the combination of 5% glucose and saline. According to recent guidelines of the ERAS group, the British intravenous fluid protocol (GIFTASUP) and the recommendations of the ACERTO Project, the most recommended intravenous fluids are the most balanced and chlorine-free solutions, such as simple or lactated ringer<sup>21</sup>.

Traditionally, oral feeding after gastric surgery is prescribed after the second postoperative day, thus leading, as a possible complication, to postoperative ileus. This delay in refeeding results in an increase in hospitalization days and consequently hospital costs. Late feeding associated with increased venous hydration in the postoperative period may be a cause of prolonged ileus. Lukey et al.<sup>22</sup>, in 2003, showed that postoperative ileus costs can reach US\$ 750 million per year due to the procedures involved and the number of hospitalization days. In this current series, the vast majority of patients, even with digestive anastomosis, received food on the same day of the operation, according to modern multimodal protocols such as the ERAS or the ACERTO Project<sup>11</sup>.

At present, several guidelines of anesthesia societies recommend fasting of two hours for liquids with carbohydrates<sup>23-25</sup>. A recent guideline of the ERAS group recommends this prescription also for obese patients undergoing gastroplasty. However, when we examine the data regarding the assumptions and the reality of preoperative fasting prescription, we perceive a disagreement between what surgeons think they do and what the research patients received. In fact, there was a two-hour increase in fasting for solids and five hours for liquids between the data from the

medical questionnaire and the data contained in the patients' charts. This is relevant and allows affirming that there is still a need for greater attention and emphasis on the prescription and the conduction of correct preoperative fasting. These data are not new, and several studies have previously shown a large gap between prescribed fasting and fasting observed in the preoperative period. The multicenter BIGFAST study, performed in 17 Brazilian hospitals, showed that almost 50% of patients with six to eight hours of prescribed fasting really fasted for more than 12 hours before surgery. Even in hospitals where preoperative fasting is already performed according to the ACERTO Project, this interval exists, although it is not too long. A study in the HUJM showed that abbreviated fasting of two hours for clear liquids preoperatively in the medical prescription extended to four to five hours in the observed reality<sup>26</sup>. One possible explanation for the data we found is that due attention has not yet been given to preoperative fasting and perhaps an adequate protocol for patient orientation does not exist.

Regarding the other mentioned perioperative care, we found a good agreement between the medical questionnaire and the hospital records regarding analgesia, use of catheters and drains, and prophylaxis of nausea or vomiting. These data show a perfect synchrony between the interviewed surgeons' assumptions and the reality of the prescription found in the medical records. In general, the recommendations of the ACERTO Project were followed in this series of 200 patients. Most likely, the results are due to the wide surgical experience of the researched team, with more than ten years of surgical practice. In addition, many of them come from the HUJM, where in their graduation and/or post-graduation they got in touch with the ACERTO Project.

In conclusion, we can say that the concepts of the ACERTO Project were known in the researched environment and were associated with good results in the postoperative period. With the exception of preoperative fasting, the assumptions and the reality in perioperative care in bariatric surgery were close in the HMSM.

## R E S U M O

**Objetivo:** verificar o grau de conhecimento entre cirurgiões, sobre as recomendações do Projeto ACERTO em cirurgia bariátrica, correlacionando o “imaginário”, sobre suas prescrições, e a “realidade”, através de dados de prontuários de seus pacientes. **Métodos:** estudo observacional longitudinal prospectivo comparativo entre o “imaginário” dos cirurgiões, obtido através de respostas de questionário sobre condutas recomendadas pelo ACERTO e a análise de dados clínicos “reais” encontrados em prontuários de pacientes submetidos à cirurgia bariátrica. Foram analisados: jejum pré-operatório, realimentação precoce, hidratação venosa perioperatória, antibioticoprofilaxia, uso de sondas e drenos, analgesia e profilaxia de náuseas e vômitos. Foram confrontadas as respostas de sete cirurgiões e dados de 200 prontuários médicos. **Resultados:** todos os cirurgiões entrevistados conheciam o Projeto ACERTO. Cinco (72%) responderam que seguiam o protocolo completamente. O tempo mediano de jejum pré-operatório foi maior do que o relatado pelos cirurgiões ( $p < 0,05$ ). Os pacientes receberam realimentação precoce em 96,5% dos casos. O volume mediano de fluidos prescritos nas primeiras 24 horas foi 4000ml, condizente com a entrevista. Em relação à antibioticoprofilaxia, uso de sondas e drenos, analgesia e prevenção de náuseas e vômitos, não houve diferença entre o respondido e o constatado nos prontuários. **Conclusão:** o Projeto ACERTO era bem praticado entre os cirurgiões pesquisados, havendo boa correlação entre o “imaginário” e “realidade” dos cuidados perioperatórios prescritos em pacientes submetidos à cirurgia bariátrica.

**Descritores:** Cirurgia Bariátrica. Cuidados Pós-Operatórios. Cuidados Intraoperatórios. Medicina Baseada em Evidências.

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Received in: 15/12/2016

Accepted for publication: 02/03/2017

Conflict of interest: none.

Source of funding: none.

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