ELSEVIER

e-SPEN,
the European e-Journal
of Clinical Nutrition
and Metabolism

http://intl.elsevierhealth.com/journals/espen

ORIGINAL ARTICLE

Enhancing surgical recovery in Central-West Brazil: The ACERTO protocol results

José E. de Aguilar-Nascimento*, Alberto Bicudo-Salomão, Cervantes Caporossi, Raquel M. Silva, Eduardo A. Cardoso, Tiago P. Santos

Department of Surgery, Medical School, Federal University of Mato Grosso, Rua Estevão de Mendonça 81 apto 801, 78043-300 Cuiaba, Brazil

Received 31 May 2007; accepted 14 January 2008

KEYWORDS
Nutritional therapy;
General surgery;
Preoperative fasting;
Postoperative early feeding;
Postoperative complications;
Enhanced recovery

Summary
Background & aims: Multimodal strategies enhance postoperative recovery. The aim of this study was to evaluate the results of an ERAS-based protocol named ACERTO project in elective patients in a University Hospital in Central-West Brazil.
Methods: A total of 308 patients (M/F = 160/148; median age = 47 (18–85) years old) entered the study. Patients received either traditional ($n = 78$) or a multidisciplinary protocol of peri-operative care (ACERTO project; $n = 230$).
Results: The implantation of the ACERTO protocol was followed by a decrease in both pre- (16 [8–27] vs. 4 [2–20] h, $p < 0.001$) and postoperative fasting time (0 [0–20] vs. 1 [0–14] day; $p < 0.01$), and in the volume of intravenous fluids (8 [1–101] vs. 2.0 [0–100] L, $p < 0.001$). The changing of protocols reduced hospital stay by 2 days (5 [2–104] vs. 3 [1–64] days, $p = 0.002$) and surgical site infection rate by 66% (11.5%; 9/78 vs. 3.9%; 9/230, $p = 0.01$; odds ratio = 3.2, 95%CI: 1.2–8.4). Per-protocol analysis showed that both postoperative stay and morbidity diminished, and in the subset of major operations both infectious and non-infectious complications decreased only in patients who completed the protocol ($p < 0.01$).
Conclusion: The implantation of multidisciplinary routines such as the ACERTO protocol diminishes both hospitalization and morbidity in general surgery.

Introduction

Traditional peri-operative care is based on old concepts and most of the current management of surgical patients is

* Corresponding author. Tel./fax: +55 65 36234020.
E-mail address: aguilar@terra.com.br (J.E. de Aguilar-Nascimento).

1751-4991/$ - see front matter © 2008 European Society for Clinical Nutrition and Metabolism. Published by Elsevier Ltd. All rights reserved.
doi:10.1016/j.eclnm.2008.01.003

grounded in empirism.[1] The new paradigm of evidence-based medicine has been showing in recent years that some routines and protocols in peri-operative care are useless and in some cases harmful.[2] Preoperative fasting of 6–8 h, postoperative re-feeding only after ileus resolution (2nd–4th PO day), routine use of nasogastric tube and abdominal drains, and preoperative bowel preparation for colorectal surgery are some of the conventional prescriptions followed by surgeons in many countries.[1–3] Moreover, preoperative nutritional status evaluation and peri-operative nutritional support are sometimes neglected.[4]

The results reported by the ERAS (Enhanced Recovery After Surgery) group, which is a multicentric European project aiming at accelerating postoperative recovery of patients by multimodal strategies, showed that the changes of some protocols were associated with both faster postoperative hospitalization and decrease of infectious morbidity.[5] Various studies using this multimodal protocol have consistently shown a faster recovery by the patients.[3,5–8]

In 2005, the Department of Surgery of Julio Muller Universitary Hospital initiated the ACERTO project based on the various new routines advocated by the ERAS group.[5] This multidisciplinary project was implanted after a day-long seminar involving residents, surgeons, dietitians, physiotherapists, nurses, and anesthetists. We named the project ACERTO (Aceleração da Recuperação Total) because it is a Portuguese word meaning ''hit the target'', ''get it right'' or ''rightness'' and at the same time a Portuguese acronym for ERAS (Enhanced Recovery After Surgery). This study aimed at comparing the clinical outcome before and after the implementation of this multimodal peri-operative protocol in general surgery.

Material and methods

We prospectively studied all patients admitted at the Department of Surgery infirmary of the Julio Muller Universitary Hospital, and candidates to elective operations from January 2005 to September 2006. The study design was approved by the Ethical Research Committee of the hospital.

The study had two distinct phases: before (January–June 2005), and after the implementation of the ACERTO protocol (July 2005–July 2006). In the first period (before the implementation of the ACERTO protocol) data were prospectively collected without previous knowledge of either the medical (surgeons, anesthetists, and residents) and non-medical staff (nurses, dietitians, and physiotherapists) of the surgical ward (phase 1). After six months, the data were presented to the entire staff in a whole-day seminar previously planned to introduce the ACERTO project. The seminar included the following issues: (1) Peri-operative nutrition; (2) Peri-operative intravenous fluids; (3) Anesthesia and postoperative analgesia to reduce the organic response to trauma; (4) Peri-operative care (pre-operative information and counseling, use of drains and nasogastric tubes, and early mobilization); (5) Mechanical bowel preparation; and (6) Anti-microbial prophylaxis. These topics were arranged in a booklet and distributed to all personnel. The staff was not obligated to follow the various routines of the entire project. Instead, adherence to the new protocol was let be in a free-willing basis. Data collection resumed the next day following the seminar (phase 2 – after the ACERTO protocol). Audits were conducted every three months and comparisons between before and after the initiation of the ACERTO protocol were showed to all staff. Table 1 shows the conventional policies adopted by the Department of Surgery before the project and those proposed by the ACERTO protocol.

The surgical procedures were divided as major and minor operations. Major operations included open laparotomies lasting for more than 3 h, and procedures with at least one anastomosis performed at either the gastrointestinal tract or billiary tree. As minor operations were included video- or open cholecystectomies, herniographies, videolaparoscopies for diagnosis and biopsy, and laparotomies lasting less than 3 h. Nutritional status was assessed by subjective global assessment.[9] Patients were categorized as malnourished or normal.

In all phases the preoperative fasting time, indication and utilization of preoperative nutritional support, volume of peri-operative intravenous fluids, peri-operative use of abdominal drains and nasogastric intubation, and the post-operative day of return of feeding were collected. The mean endpoints in the two periods were the postoperative

Table 1 Conventional and the ACERTO routines of peri-operative care

Conventional care	ACERTO project care
Preoperative counseling at surgeon's discretion	Oral preoperative counseling
Preoperative fasting of 8 h	Preoperative fasting of 2 h. Six and 2 h before operation the patient drank 400 and 200 mL of a beverage containing 12.5% of maltodextrine
Postoperative feeding after ileus resolution	Early oral or enteral postoperative feeding (6–24 h)
Preoperative nutritional support if malnourished and candidate to major operation	Preoperative nutritional support if malnourished and candidate to major operation
Mechanical bowel preparation for colorectal operations	No mechanical bowel preparation
Intravenous fluids at a rate of 30–50 mL/kg/day usually until the 3–4th PO day	Avoid excessive intravenous fluid (no more than 30 mL/kg/day). No IV fluids for minor operations postoperatively. Discontinuation of IV fluids, if possible, on the 1st PO day
Abdominal drainage and nasogastric tube at surgeon's discretion	Avoid drains and nasogastric tubes
Mobilization on the 1st PO day	Early mobilization (if possible on the same day of the operation)