



FOCUS ON: ENHANCED RECOVERY

Enhanced recovery after colorectal surgery

M. Grover

Department of Anaesthesia and Intensive Care, St Mark's Hospital, Watford road, Harrow. HA1 3UJ, UK

S U M M A R Y

Keywords:

Enhanced recovery
Fast-track
Carbohydrate loading

Enhanced recovery represents a quantum leap in peri-operative management of patients undergoing colorectal surgery. Each of the elements of enhanced recovery are evidence based and together when used in concert provide an easy framework upon which to base future peri-operative care. The following article outlines the facets of enhanced recovery and the evidence base behind them. The role of the anaesthetist is central to the implementation of enhanced recovery and as such particular emphasis is given to fasting guidelines and carbohydrate loading pre-operatively and peri-operative fluid therapy.

© 2010 Published by Elsevier Ltd.

ERAS principles (Enhanced Recovery After Surgery) represent a quantum leap in peri-operative practice. It applies to elective colorectal surgery and has the following features:

1. The 9 Ms of enhanced recovery after surgery

- | | |
|----|--|
| 1) | Multi-Modal Multi-disciplinary rehabilitation |
| 2) | Minimises physiological derangement |
| 3) | Modulates the metabolic stress response to surgery |
| 4) | Maximises early return to normal function |
| 5) | Motivates patients and staff |
| 6) | Minimises complications |
| 7) | Modulates length of hospital stay |

2. Why do ERAS?

It is a well-known fact that after surgery functional capacity decreases. Using a traditional care approach this functional capacity reduction can last from days into weeks. There is now evidence that applying enhanced recovery principles after surgery, particularly in colorectal patients where there are multi-modal interventions, minimises the reduction in functional capacity and therefore, modulates hospital length of stay. Surgery in itself is a factor producing pain and a stress response that may result in organ dysfunction and in colorectal patients, nausea, vomiting and the presence of a functional ileus all tend to impede recovery. Likewise fatigue is compounded by sleep disturbances and hypoxaemia, and the sleep deprived state reduces mobilisation and further increases recovery time. The resultant prolonged hospitalisation has implications of increased resource use, increased nursing time, beds occupied for more time and decreased patient satisfaction.

E-mail address: mgrover@doctors.org.uk

3. What are the multi-modal facets of ERAS?

The facets can be divided into pre-operative, intra-operative and post-operative.

Pre-operative

- Pre-admission counseling.
- Fluid and carbohydrate loading without fasting.
- No pre-medication.

Intra-operative

- Laparoscopic surgery.
- Mid-thoracic epidural anaesthesia and analgesia.
- Short acting anaesthetic agents.
- Avoidance of sodium and fluid overload.
- Short incisions and no drains.
- Warm air body heating.
- Removal of NG tubes at end of surgery.

Post-operative

- Rapid mobilisation care pathway.
- Non-opiate oral analgesics and non-steroidal anti-inflammatory drugs.
- Prevention of nausea and vomiting.
- Stimulation of gut mobility.
- Early removal of catheters.
- Early resumption of oral diet.
- Audit of compliance and outcomes.

Whilst each one of these facets of the enhanced recovery after surgery programme is evidenced based, it is only when they are applied together for elective surgery that they produce a paradigm shift in how we manage patients undergoing elective surgery. This

is intended to produce both increased patient satisfaction and a decrease in complications.

In a multi-centre survey of peri-operative practice following colorectal surgery in five Northern European countries, Lassen¹ demonstrated that generally there was little evidence based care and that traditional care delivered hospital lengths of stay around 14 days. This contrasts with enhanced recovery which has demonstrated reduced length of stay to just 3 days, albeit in centres that have pioneered enhanced recovery, such as that from Denmark, coordinated by Professor Kehlet.

An alternative way of looking at the facets of enhanced recovery is as follows.

Pre-operative; information and optimisation of organ function.
 Intra-operative; stress reduction using regional anaesthesia, minimally invasive operations, normothermia, pharmacological modifiers of the stress response, effective pain relief and prophylaxis for nausea and vomiting.
 Post-operative; early mobilisation helped by minimising the use of tubes, drains and catheter and early oral nutrition.

This has a documented positive profile upon morbidity, safety, cost and patient satisfaction.

4. Does ERAS work?

In a systematic review of enhanced recovery programmes in colonic surgery, Wind and colleagues demonstrated that there was a beneficial effect on hospital stay. That is to say that patients in an enhanced recovery programme had a reduced hospital length of stay.² Morbidity rates in patients within enhanced recovery programmes were reduced. These encouraging results must be tempered with the fact that no beneficial effect was demonstrated for hospital readmission rates, so patients within enhanced recovery programmes did not demonstrate a reduced readmission rate.

It must be emphasised that a protocol alone is not enough to successfully implement an enhanced recovery programme following colorectal surgery. Maessen and colleagues surveyed the use of these pathways. In hospitals purporting to implement enhanced recovery, standard facets of enhanced recovery were assessed and compliance calculated for each facet.¹ Only half of patients were actually out of bed at all in the first 24 h and as few as a third taking oral fluids greater than 800 ml. In up to 50% of patients urinary catheters and epidurals were not removed on the day after the operation. So whilst a protocol is useful and important for running an enhanced recovery programme, compliance with and use of these protocols is vital if benefits are to accrue.

5. How does ERAS modulate surgical stress?

Carbohydrate loading.
 Laparoscopic surgery.
 Thoracic epidural (open).
 Remifentanyl target controlled infusion (laparoscopic).
 Fluid therapy.
 Early resumption of oral diet.
 No drains or drips

5.1. Carbohydrate loading

It is well-known that hyperglycaemia is associated with increased complications in diabetics. It is also known that hyperglycaemia increases complications in non-diabetics. In a study by

Doenst,³ greater than 6000 patients undergoing cardiac surgery were followed and their highest glucose levels on cardiopulmonary by-pass recorded. It was demonstrated that as the glucose concentration increased, so did the percentage mortality in the peri-operative period, both with non-diabetics and diabetics. It is not the peak glucose concentration itself that is the source of the problem. More likely it is that the cells cannot take up glucose resulting effectively in increased insulin resistance.

The normal physiological response to surgery is to increase nitrogen losses hence developing a negative nitrogen balance, increase energy expenditure and increase glucose levels in the blood. There are increased insulin levels in the blood but decreased insulin sensitivity. Post-operative patients have the same glucose metabolism profile as type 2 diabetics, as by Nygren et al., demonstrated the time course of insulin resistance peri-operatively. The peak of insulin resistance occurs at about day 2, and then gradually improves but in some cases this may take up to 20 days to return to normal levels.⁴ This fits poorly with the current approach to fasting and there is no evidence base to support traditional fasting guidelines. The Association of Anaesthetists of Great Britain and Ireland 2001 have suggested 2 h fasting for clear non-particulate and non-carbonated fluids. Exclusions include emergency surgery; upper GI surgery and those patients likely to have slower GI transit times. It appears that the administration of carbohydrate loading drinks to patients in the peri-operative period increases insulin sensitivity by up to 50%, increases the peripheral intake of glucose and increases glycogen formation. If correct this means the patient is rendered anabolic in the peri-operative period rather than catabolic.

The metabolic profile of patients within enhanced recovery programmes with carbohydrate supplementation pre-operatively is altered considerably. Nitrogen losses are decreased, nitrogen balance becomes positive, energy expenditure is reduced, the post-operative change in glucose is reduced and insulin resistance is also reduced.⁵

In practice carbohydrate loading is most often achieved using a product called Pre-op by Nutricia (in most of the validated studies to date). It consists of 12.6 g of complex carbohydrate in the form of Maltodextrin and is prepared as a clear non-carbonated liquid. Carbohydrate rich drinks are administered 800 ml the night before surgery and 400 ml on the day of surgery up to 2 h prior to the induction of anaesthesia. This has been demonstrated by Soop et al to reduce thirst, hunger and anxiety pre-operatively.⁶ Nygren et al. demonstrated no deleterious consequences on gastric emptying with carbohydrate loading taking the same time as water to empty from the stomach, but did find a significant reduction in post-operative insulin resistance and a reduction in post-operative nausea and vomiting.

6. Evidence based peri-operative fluids for colorectal surgery

Bowel preparations can cause significant fluid depletion and therefore necessitate a preload in the anaesthetic room of fluid prior to induction of anaesthesia. Yet analysis by Slim⁷ demonstrated that there is no real benefit from bowel preparation and it has been suggested that it may increase the risk for an anastomotic leak. For this reason bowel preparation is not recommended for use in enhanced recovery programmes for colorectal surgery unless the patient is having a total mesorectal excision.

In a multi-centre randomised controlled blinded trial, Brandstrup et al. have demonstrated the effects of intravenous fluid restriction on post-operative complications in patients undergoing elective colorectal surgery.⁸ The two groups differed in that patients in the restrictive fluid strategy group received no pre-loading, no fluid replacement for third losses, for maintenance intra-operatively and for blood loss. The standard fluid strategy

Download English Version:

<https://daneshyari.com/en/article/2607908>

Download Persian Version:

<https://daneshyari.com/article/2607908>

[Daneshyari.com](https://daneshyari.com)