

Review of Preoperative Carbohydrate Loading

Pogatschnik C and Steiger E. Nutrition in Clinical Practice 2015; Sage Journals on-line July 2015.

Objective

To review the rationale and outcome data reports for carbohydrate (CHO) loading with clear fluids up to two hours prior to surgery; one of the nutritional elements of the Enhanced Recovery After Surgery (ERAS®) society recommendations.

Effect of Surgery on Carbohydrate Metabolism

Surgery causes increased insulin resistance, thought proportional to the degree of tissue trauma, and this stress response is associated with postoperative hyperglycemia. Glucose control is thought to be central to reducing postoperative morbidity and mortality.

Traditional Surgical Fast and Its Complications; Potential Benefits of Carbohydrate Beverages

The literature shows that volume and pH of gastric contents were nearly the same after a standard NPO after midnight fast as for a 2 hour fast. Both clear liquids and CHO solutions empty in about 90 minutes, and there are no known cases of aspiration pneumonia using the 2-hour clear liquid limit. Accordingly, anesthesia guidelines from Canada, Europe and the US all recommend a liquid fast for 2 hours prior to surgery.

Insulin Resistance and Immune Response

NPO after midnight creates a catabolic state, whereas clear fluids containing adequate amount of complex CHO (400 mL of a 12% solution, primarily as maltodextrin to limit osmolality and prevent delayed gastric emptying) may generate a more anabolic state when given a few hours before surgery. This dose of maltodextrin has been associated with a reduction in insulin resistance by 50%. Conversely, increased insulin resistance may lead to increases in markers of inflammation.

Postoperative Well-Being

A decrease in the length of fasting and the use of CHO-containing fluids has been reported to improve perioperative thirst, hunger, malaise, fatigue and anxiety. The administration route for CHO (oral vs IV) needs more study in relationship to these symptoms, as the majority of studies use the oral route.

Surgical Complications and LOS

A recent Cochrane review found patients in the CHO loading group had a 0.3 day shorter LOS than the fasting group, but no difference was detected when CHO loading and placebo groups were compared.

Enhanced Recovery After Surgery (ERAS)

In addition to preoperative CHO loading, ERAS recommendations include epidural anesthesia, adequate postoperative pain control, early enteral feeding and mobilization.

When the various protocols are combined and a high level of adherence is achieved, LOS may be reduced by 2-3 days and complication rate by as much as 50%.

Conclusion

Preoperative CHO loading makes patients more comfortable and is safe when given up to 2 hours before surgery. Lowering insulin resistance makes good metabolic and theoretical sense, but positive clinical outcome results from CHO loading alone are not proven.

However, preparing the preoperative patient by combining proven approaches along with CHO loading is worth considering.

Summary prepared by Nestlé Healthcare Nutrition. The complete study can be accessed online at: <http://ncp.sagepub.com/content/early/2015/07/15/0884533615594013.full.pdf+html>