Reviewer's report

Title: The Predictive Value of Hunger Score on Gastric Evacuation after Oral Intake of Carbohydrate Solution

Version: 0 Date: 03 Sep 2017

Reviewer: William Phillips

Reviewer's report:

General comments:

This paper has interesting data regarding the gastric emptying of a carbohydrate solution in normal Chinese adults and its correlation to hunger. Although hunger generally correlates with gastric residual contents, the authors state that subjective hunger cannot be reliably used in individual patients to accurately predict gastric residual volumes, but can be used as a second check after oral intake of clear fluids. The authors should comment more on what they mean by use of hunger as a second check, and clearly specify what would be the first check. Based on the findings of this current study, what liquid meal do the authors think should a patient be allowed to drink before surgery and how long before surgery should the patient safely be permitted to take the liquid meal.

Specific comments:

In the method section, support should be given to validate that the methodology used to calculate gastric volumes by MRI. Information should be provided as to the accuracy and variability of the MRI method. This information is important so that the reader can know that the gastric emptying volumes are valid. MRI validation could be a cite to prior papers that used the same MRI methodology to calculate gastric emptying volume or demonstration by the researchers that the volumes are accurate. For example, MRI imaging could be performed immediately after the subjects ingest the 8ml/kg volume to determine if the MRI measured gastric volumes are close to 8 ml/kg immediately upon ingestion.

In regards to gastric emptying volumes, in this study, normal subjects were given 8 ml/kg of carbohydrate containing fluid. If the average weight of the subjects was 66.4 kg, they received 66.4 grams of carbohydrate which would be 265 kcal. In this paper, patients had only 4 ml/kg gastric volumes remaining in their stomachs at 30 minutes. This means that the average patient emptied 132.5 kcal in thirty minutes, or 4.4 kcal per minute. This rate of gastric emptying is very rapid for normal subjects on a kcal basis as compared to most prior reports in which average gastric emptying of kcal of protein, carbohydrate or fats is around 2.1 kcal/min.

Regulation of the gastric emptying of glucose.

Brener W, Hendrix TR, McHugh PR.

Glucose assumed, soon after filling the stomach, a slow and calorie-constant emptying pattern such that 2.13 kcal of glucose were delivered per minute to the duodenum for all three concentrations of glucose.

tive effects of oral and intraduodenal glucose on blood pressure, heart rate, and splanchnic blood flow in healthy older subjects.

Gentilcore D1, Nair NS, Vanis L, Rayner CK, Meyer JH, Hausken T, Horowitz M, Jones KL.

The mean GE of oral glucose was 1.3 +/- 0.1 kcal/min.


Rapid gastric emptying of an oral glucose solution in type 2 diabetic patients.

Phillips WT1, Schwartz JG, McMahan CA.

Gastric emptying half time of 65 minutes for a 200 kcal glucose meal. Kcal/min emptying rate of 1.5 kcal

One possibility is that the MRI measurements are overestimating the rate of gastric emptying. It is also possible that there are ethnic differences in the Chinese population regarding the gastric emptying of carbohydrate solutions.


It would be interesting to have monitored the plasma glucose levels in these patients at 30 minute time points. Generally hunger is related to blood glucose levels and it increases as blood glucose approaches fasting levels or frequently falls below fasting after a carbohydrate load. Measurement of blood glucose with a simple finger stick monitor would be another method to
predict that the stomach has minimal residual volume and it would likely correlate with hunger. In these particular patients, if gastric emptying of 50% of the meal contents (265 kcal) actually occurs by 30 minutes, their postprandial glucose and insulin levels should be higher than normal.

Minor corrections:

1. ERAS should be defined the first time it is used in the first paragraph of the background and not in the second paragraph where it is currently defined.

2. In the discussion at the 5th paragraph, several methods of measuring gastric emptying were mentioned, but there was no mention of ultrasound which is a common method used to assess gastric emptying. Ultrasound should be added as a technique as referenced in this paper #7 reference.

3. Correct the English of this sentence in the second paragraph of the discussion. "It has been reported that the gastric residual volume could be as much to cause gastric reflux even after a long time fasting."

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

No

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

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