

EDITORIAL

Pre-operative fasting: how long is necessary?

Mendleson in 1946 [1] advocated prevention of aspiration pneumonitis by prohibition of oral intake during labour, alkalization of gastric contents, competent administration of general anaesthesia and appreciation of the dangers of aspiration during induction and recovery. Today the low incidence of aspiration under general anaesthesia (1.4–6.3 per 10 000 anaesthetics [2]) is due in part to implementation of these recommendations. Historically patients fasted for a minimum of 6 h prior to induction of anaesthesia although the origins of this regimen are unknown.

In 1990 the following guidelines were published by the Canadian Anaesthetists Society [3]:

No solid food should be ingested on the day of surgery.

Unrestricted clear fluids should be permitted until 3 h before the scheduled time of surgery and oral medications should be taken with 30 mL of water up to 1 h before surgery.

The pre-operative administration of an H₂ receptor blocker should be considered for patients who may be at increased risk of regurgitation and aspiration of gastric contents.

In 1993 similar recommendations were made by Strunin [4], Kaller and Everett [2] and Petring and Blake [5].

Prior to revision of the recommendations, the safety of allowing oral fluid intake up to 3 h pre-operatively had been established in studies involving both adults [6–9] and children [10,11]. In the majority of these studies the stomach was emptied, using a wide bore orogastric tube, after induction of general anaesthesia. Critical gastric contents were defined as a gastric volume of greater than 0.4 mL kg⁻¹ and a pH of less than 2.5, based on data that had been extrapolated from animal research. In a more recent study [12] Soreide and co-workers [1995] confirmed these findings. In addition they reviewed the statistical power

of 10 studies on the effects of pre-operative fluids and performed meta-analysis on the data. They concluded that clear fluids are safe up to 2 h pre-operatively in low risk, non-obese, ASA I and II patients.

Although a light early breakfast is commonly allowed in patients undergoing afternoon surgery, there is little experimental evidence to confirm or refute the safety of this practice. Solid food passes through the stomach unpredictably and the rate of gastric emptying depends on the type of food ingested. Carbohydrates for example may be emptied from the stomach within a few hours whereas gastric emptying of protein and fat take longer. Mendleson [1] described five patients with aspiration of solid particles into the lungs. Two of these patients died from suffocation, both of whom had ingested a full meal, one at 8 h previously and the other 6 h previously. In 1993 Miller *et al.* [13] showed no significant difference in gastric volume between patients fasting overnight and those receiving a light breakfast. However, in one patient who received breakfast, solid particles were obtained when the stomach was emptied 235 mins later. However, it is unlikely that any large solid particles would have been aspirated via the 18-gauge orogastric tube (internal diameter 4 mm) used in the study.

To date studies have included only low risk, elective, non pregnant patients at low risk of aspiration pneumonitis. Risk of aspiration may be increased by physiological, pathological and pharmacological factors. Gastric motility is slightly slower in healthy patients over 70 years of age, although gastric volume and pH at induction of anaesthesia have been shown to be similar to that in young patients [14]. The same study found paediatric patients to have increased gastric volume and acidity compared with adults. The safety of allowing clear fluids up to 2 h pre-operatively appears to have been established in children [10,11]. Seventy five per cent of obese patients have a gastric volume and pH that place them at increased risk of regurgitation and aspiration [15]. In pregnancy there

is a decrease in lower oesophageal sphincter tone and an increase in intra gastric pressure that puts the pregnant patient at increased risk of regurgitation from 14 week's gestation. Although some studies describe a delay in gastric emptying throughout pregnancy [16], others suggest that delay occurs only during labour [17]. It has been shown that patients with intestinal obstruction, pyloric stenosis, hiatus hernia or who have undergone vagotomy are at increased risk of regurgitation of gastric contents. Gastritis or peptic ulcer increase the incidence of critical gastric volume and pH [18]. The effect of chronic renal failure on gastric emptying is equivocal, delayed gastric emptying having been demonstrated during peritoneal dialysis only when the dialysate was indwelling. A delay in gastric emptying has also been reported with electrolyte disturbance and uraemia [19] and delayed gastric emptying of solids has been reported in patients with diabetic neuropathy [20]. Although the presence of delayed gastric emptying is controversial in some of these groups of patients because studies both confirm and refute a delay, caution should be exercised until further studies are undertaken to clarify the safe management of these patients.

Following the recommendations advocating a more liberal pre-operative fasting regimen in 1990 [3] there have been no reports published of an increased incidence in regurgitation and aspiration under anaesthesia. However, it appears patients are still subjected to unnecessarily long periods of pre-operative fasting owing to the way operating lists are scheduled and the need for education of nursing and clerical staff and patients themselves. Surveys of pre-operative procedures have shown that prolonged fasting is one of the most common factors contributing to patient discomfort [21,22]. It is therefore important that we implement these guidelines in low risk patients and undertake to evaluate the relative risks and benefits of a shortened pre-operative fast in patients currently considered to be at increased risk of regurgitation and aspiration of gastric contents.

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