

Preoperative fasting after soft drink intake: 2 hours may be enough

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Abstract Sufficient preoperative fasting time is essential for safe induction of anesthesia to prevent aspiration of gastric contents. However, the time recommended for sufficient preoperative fasting varies greatly, depending on the nature of the oral intake, from 2 h for clear liquids to 6 h for solid foods. We report the case of a 30-year-old man who drank about 600 ml of the carbonated, glucose-rich soft drink, 7-UP, 2 h before surgery and absorbed nearly all of it within these 2 preoperative hours.

Key words Preoperative fasting · Preoperative oral fluids · Gastric emptying

Case report

A 30-year-old man, ASA 2, height 175 cm, weight 70 kg, body-mass index (kg/m^2) 22.86, was scheduled for open reduction and internal fixation of a complicated fracture of the proximal phalanx of his left 4th digit, which he suffered the night before surgery. After admittance to the hospital he was kept nil by mouth for 8 h overnight. The next morning, however, 2 h before his scheduled surgery, he drank approximately 600 ml of the carbonated, glucose-rich soft drink, 7-UP, but he had not eaten any solid food. Because the orthopedic surgeons had agreed to perform the procedure with the patient under regional anesthesia, the operation was not postponed to allow for a prolonged fasting time. On arrival in the operating room area, the patient refused all proposals for regional anesthesia and insisted on general anesthesia.

The patient was premedicated with midazolam 2 mg and metoclopramide 10 mg. General anesthesia was induced uneventfully with cricoid pressure and rapid

sequence with *d*-tubocurarine 3 mg, fentanyl 100 μg , propofol 200 mg, and suxamethonium 100 mg. After tracheal intubation was confirmed and the endotracheal tube was secured, a large-bore orogastric tube was inserted into the stomach for blind aspiration of gastric contents. Only 20 ml of clear brownish gastric fluids was aspirated, which on investigation had a pH of 5.0. The operation lasted for 2 h, and anesthesia was uneventful. After surgery the patient emerged smoothly from anesthesia and was soon discharged back to the ward.

Discussion

For safe induction and maintenance of general anesthesia, aspiration of gastric contents has to be avoided. Aspiration of gastric contents is most likely to occur during induction of anesthesia because of relaxation of the lower esophageal sphincter [1]. The severity of the consequences of regurgitation and aspiration of gastrointestinal contents under general anesthesia depends upon the nature, solidity, acidity, and volume of the aspirate. Whereas solid boluses can cause mechanical obstruction of the airways, the effects of aspirated fluids depend on their volume and especially the pH. The aspiration of a certain amount of acidic fluids can cause chemical pneumonitis, also called Mendelson's syndrome [2]. Although the volume and pH necessary to produce the aspiration syndrome are unknown, the volume estimates range from 20 ml [3] to 25 ml ($0.4 \text{ ml} \cdot \text{kg}^{-1}$) [4], and the pH estimates range from $\text{pH} \leq 2.5$ [5–7] to $\text{pH} 3.0$ – 3.5 [8]. The digestion time of food depends on the type of food consumed [9], and a fasting time of 6 h is usually considered sufficient to guarantee complete gastric emptying [10]. Such long fasting times, however, have proven unnecessary for preoperative oral fluid intake. In healthy individuals, water and crystalloid fluids have a gastric half-time of 12 min [11]. In patients 1 h postpartum, the half-time for absorption of

500ml of water taken orally was 13min [12], and in patients 2 or 3 days postpartum, the half-time for absorption of 400ml of water was 11min [13]. Patients who had consumed 360ml of apple juice 4h preoperatively and subsequently were given ranitidine 150mg and metoclopramide 10mg had neither increased gastric volume nor increased acidity, as measured by intraoperative gastric suctioning [14]. In addition, data would indicate that water given orally in unlimited amounts up to 2h preoperatively does not affect gastric volume, gastric pH, or plasma osmolality [15].

Trauma can delay gastric emptying [16], and it has been shown that the severity of the trauma is a more important determinant of the residual gastric volume than the fasting time [17]. The more severe the pain, the greater is the degree of stomach paralysis [18]. If, however, the onset of severe pain is prevented by medical intervention, delay of gastric emptying can be prevented [18–20].

Blind aspiration of gastric contents may underestimate gastric volume by 15ml [21]. A total gastric volume of 35ml (20 + 15ml) at pH 5.0, as in this case, does not constitute a great danger to the patient, because of either its volume [3,4] or its pH [5–8], especially when anesthesia is induced with cricoid pressure and rapid sequence. Some institutions have relaxed their preoperative fasting rules to allow their adult patients to drink unrestricted amounts of clear fluids, including carbonated beverages, up to 3h before surgery [22].

If observations at other institutions support the findings of this case report, a reduction of preoperative fasting times in elective surgery cases to 2h after unrestricted fluid intake would be permissible.

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