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Should adult ventilated patients on the intensive care unit be fasted preoperatively?

In the absence of separate guidelines for critically unwell ventilated patients in the intensive care unit who are undergoing surgery, questions arise about whether patients in intensive care should be starved preoperatively, despite already having a protected airway.

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Introduction

Guidelines suggest that all adult patients undergoing elective surgery should not eat for 6 hours and stop clear fluids 2 hours preoperatively to reduce the risk of pulmonary aspiration of gastric contents from a full stomach, particularly between induction of anaesthesia and intubation. However, in the absence of separate guidelines for critically unwell ventilated patients in the intensive care unit who are undergoing surgery, questions arise whether intensive care unit patients should be starved preoperatively, despite already having a protected airway.

Arguments against fasting

Preoperative fasting has a multitude of adverse physiological effects including depletion of stored nutrients, complex neuroendocrine and immune processes encouraging protein catabolism and inflammatory responses. Coupled with the stress response and insulin resistance associated with surgery, the patient's recovery may be impacted.

Many patients are malnourished on admission to the intensive care unit and critical illness compounds this baseline caloric insufficiency by inducing a hypermetabolic state. It has been shown that, as a result of prolonged fasting periods pre-intervention, up to 59% of ventilated patients do not achieve their energy prescription target (Gonik et al, 2016), which is associated with increased morbidity and complications.

In elective surgical patients, preoperative high-calorie carbohydrate drinks are well established as a key part of enhanced recovery protocols to mimic the fed state, blunting the neuroendocrine response and catabolic processes, and improving muscle function postoperatively (Fawcett and Thomas, 2019). This practice has not been studied in intensive care unit patients.

A retrospective cohort study of intubated trauma patients compared those who had been fasted for 6 hours and those in whom enteral nutrition was stopped just before transfer to theatre (Parent et al, 2016). Results showed a significant reduction in calorie intake for those who had been fasted, with little effect on pulmonary complications. Mortality also decreased from 15% in the fasted group to 8% in those whose nutrition was stopped just before surgery.

A blinded, randomised controlled trial studied patients undergoing percutaneous tracheostomies (Gonik et al, 2016). The control arm fasted patients for 6 hours pre-procedure and the treatment arm for 45 minutes. Results showed a significant reduction in calorific intake in the control patients with no change in aspiration risk.

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Arguments for fasting

Pulmonary aspiration is potentially fatal, occurring in 1 in 7000 general anaesthetic cases, the main risk factor being a full stomach (Fawcett and Thomas, 2019).

Although intensive care unit patients may be intubated, there is always a risk of accidental extubation. In theatre the patient is often placed in the supine position, increasing the risk of passive regurgitation of gastric contents into the mouth. Despite being intubated the

airway may not be fully protected from aspiration as a result of leakage past the cuff of the endotracheal tube, especially when cuff pressures are inadequate or in the event of cuff failure.

Delayed gastric emptying and poor absorption of enteral feed has been reported in 60% of adult intensive care unit patients (Ladopoulos et al, 2018) who require prokinetic drug treatments. These patients may have increased gastric residual volume and therefore aspiration risk.

Given that there is little level one evidence available in the literature investigating this in intensive care unit patients, continuing to use evidence-based guidelines is the safest option for these patients.

Conclusions

In intubated patients, the high-risk period for pulmonary aspiration is largely bypassed, so theoretically there should be no increased risk of pulmonary aspiration. Small-scale clinical trials have demonstrated that there is no increased risk of pulmonary aspiration with reduced starvation times but that there is a significant benefit in terms of calorific intake.

This being said, it is not possible to guarantee that the airway is always fully protected, for instance, in the event of accidental extubation, cuff failure or difficult surgical positioning. Patients at increased risk of gastric aspiration, such as those with diabetes, high body mass index or delayed gastric emptying, would be especially vulnerable if not fasted preoperatively.

The risk vs benefit of fasting preoperatively in ventilated adult patients on the intensive care unit could be assessed on an individual basis, taking into account the procedure and premorbid state. Technology such as gastric ultrasound may help with quantifying an individual's risk.

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