

Chapter

1

Eating and Drinking in Labor

Risks versus Benefits

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Case Study

A low-risk nulliparous patient was admitted for induction of labor at 40 + 5 weeks of gestation following spontaneous rupture of membranes 24 hours previously. She was given a prostaglandin pessary and encouraged to rest. She began to have mildly painful contractions, but after 1 g paracetamol (acetaminophen), she was comfortable and ate a light meal. Throughout the following 6 hours she became increasingly distressed and tearful. She was only 1 cm dilated, so she was given 5 mg IM diamorphine. This provided good analgesia but caused vomiting. Despite having 10 mg IM cyclizine, she continued to be nauseous and had little oral intake for the subsequent 6 hours. The fetal heart rate was normal.

Four hours later she complained that she was hungry, and her partner gave her soup and toast. She was reexamined but had not made any progress, so an oxytocin intravenous (IV) infusion was started and fetal monitoring using a cardiotocograph (CTG) was commenced. With the onset of contractions, there was a sudden fetal bradycardia lasting 3.5 minutes. A vaginal examination was performed at this time, and she was found to be only 2 cm dilated. The patient was moved into the left lateral position, and IV fluids were commenced. The fetal heart rate returned to baseline, but the fetus continued to show signs of distress for a further 40 minutes despite a further change in maternal position. The decision was made for the patient to have an emergency cesarean delivery. As per hospital protocol, she was given ranitidine 150 mg orally prior to transfer to operating theater.

The anesthetic trainee on duty tried twice to site her spinal anesthetic, but it proved very difficult. He called a colleague to attend from the main theater who also struggled to place the spinal and had two further unsuccessful attempts. The CTG remained a concern, and the obstetric team stressed the urgency for delivering by cesarean delivery because 40 minutes had

passed. In the circumstances, the patient's partner was asked to leave the theater, and the patient was given a general anesthetic using a technique that included a rapid-sequence induction. The patient was successfully intubated, and the surgery was commenced. A baby boy was delivered 2 minutes later and was initially pale with poor tone and an Apgar score of 4 at 1 minute. He was stimulated and given three inflation breaths before crying, and his Apgar score was 9 at 5 minutes. The cesarean delivery was complicated by uterine atony, resulting in a measured blood loss of 900 ml. This was managed with an additional oxytocin bolus of 5 units alongside an ongoing oxytocin infusion. The patient was transferred to an obstetric high-dependency bed for recovery, which was uncomplicated.

Key Points

- This patient initially had an uneventful induction of labor and was eating small amounts at her discretion. She started vomiting after IM diamorphine injection and had no oral intake for several hours.
- After feeling better, she requested to eat and was provided with a light meal but then unexpectedly required an emergency general anesthetic for fetal compromise. She routinely had received ranitidine preoperatively.
- The general anesthetic was conducted successfully without complication.
- This case illustrates that many women will have eaten to some degree in labor and, in spite of no risk factors, will commonly receive opioid-based drugs that may influence gastric emptying and the risk of aspiration.
- It also demonstrates that women needing operative delivery and anesthesia cannot be easily identified in early labor.

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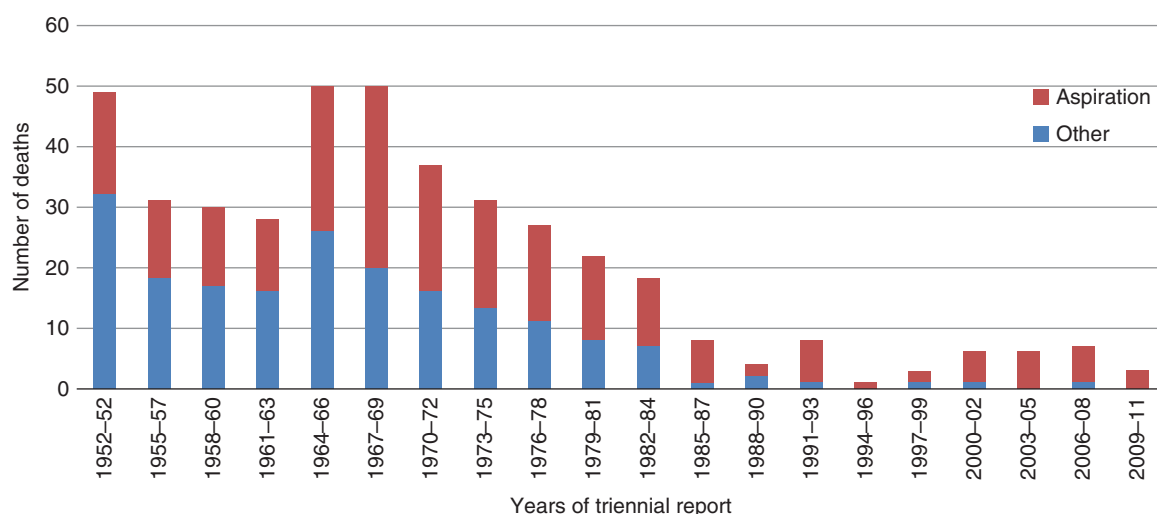


Figure 1.1 Graph showing triennial rates of maternal death from aspiration compared with other anesthetic causes.
 Source: Data collated from Confidential Enquiry into Maternal and Child Health from 1952 to 2011.

Discussion

Historically, oral intake during labor was widely acknowledged as a risk for pulmonary aspiration. This was following publication of a now-classic observational study by Mendelson in 1946 in which an association was made between aspiration during general anesthesia and feeding during labor.¹ This led to the introduction of nil by mouth (NPO) policies being used during labor with the aim of reducing the risk of aspiration should a general anesthetic be required. Obstetric anesthesia practice has developed considerably since then with increased use of regional anesthesia and safer general anesthetic practice. This, in addition to concern that fasting may be detrimental to labor, has led to considerable research in this field. Several authorities have relaxed their recommendations, but practice varies widely. The NICE intrapartum care guideline (2014) recommends that women can drink during established labor and may eat a light diet unless they have received opioids or they develop risk factors that make a general anesthetic more likely.² The American Congress of Obstetricians and Gynecologists made a recommendation to allow intake of only clear liquids in 2009 (reaffirmed in 2015).³ Despite this increase in oral intake, there has been a dramatic decline in pulmonary aspiration in obstetrics over the last 60 years,^{4,5} as demonstrated in Figure 1.1. This chapter aims to discuss the risks versus benefits of eating in labor given the current anesthetic practices.

Is There Any Value to Eating in Labor?

Labor can be prolonged, and considerable caloric expenditure may be involved. There is belief by some clinicians and midwives that calorific intake in labor may be beneficial to the mother, fetus, and the labor process. Evidence regarding required nutrition during labor is limited.

Labor has been shown to cause maternal ketosis, which is improved with isotonic drink consumption, but the impact of this on maternal and fetal well-being is unknown.⁶ It may be more appropriate to consider whether important clinical outcomes are affected by oral intake in labor, rather than metabolic disturbance. A Cochrane review undertaken in 2013⁷ included five studies on restriction of oral intake compared with eating during active labor and found little evidence of clinical benefit, even though there were sufficient numbers to detect important clinical differences. There was no significant difference in the rates of cesarean delivery, duration of labor, operative vaginal deliveries, Apgar scores, admission to neonatal special care, and maternal nausea or vomiting.⁸ Therefore, it is unlikely that any physiologic changes resulting from fasting or indeed eating during labor have a significant impact on maternal or fetal outcome.

Labor can be a stressful time, and restrictions on oral intake may be an additional distress for some women. Additionally, nausea and vomiting occur

frequently in labor, and therefore many women may not wish to eat. Nevertheless, clinicians should be sensitive to patient requests.

Is There Any Harm in Eating in Labor?

The most serious risk of oral intake during labor is of aspiration should a general anesthetic be required. This is exceptionally rare. There have been approximately 10 million deliveries over the last 15 years in the United Kingdom, during which time only four fatal cases of aspiration have been reported.⁴ This is despite an overall increase in the rate of cesarean deliveries and operative deliveries and a significantly more relaxed approach to oral intake during labor. The reasons for this are likely to be multifactorial. A possible factor is the reduction in the number of general anesthetics for cesarean deliveries in favor of regional anesthesia. However, the number of cesarean deliveries performed has increased, and thus the absolute decrease in the number of general anesthetics is marginal.⁸ What is clear is that the increase in oral intake has had little impact on severe morbidity and mortality.

The Cochrane review of eating in labor did not have sufficient evidence to detect differences in rates of pulmonary aspiration.⁷ It was the opinion of the Cochrane authors that because there is no evidence of benefit or harm, there is no justification for restriction of fluids and food in labor for low- or high-risk women. However, pulmonary aspiration is so rare that it is a challenging endpoint to investigate. Even large multicenter trials will not have adequate power to detect differences in aspiration risk, and the current meta-analysis cannot provide evidence of safety. Therefore, it should really be argued that there is insufficient evidence to determine whether it is safe to eat, given that it is accepted practice to avoid oral intake prior to anesthesia.

Who Should Eat, What to Eat, and When to Eat?

The commonly recognized patient factors for aspiration are obesity and airway management problems, which can cause air to inflate the stomach and potentially increase gastroesophageal reflux.⁸ However, the volume and nature of gastric contents are likely to be equally, if not more, important.⁸

Normally, gastric emptying depends on the pressure gradient between the stomach and the duodenum, as

well as the volume, caloric density, and pH of the gastric fluid. Clear liquids are emptied from the stomach very quickly (mean half-time of ~10 minutes⁹), which means that 95 percent of the contents are emptied within 1 hour.^{10,11} Solids are much slower to empty, with a mean half-time of 2 hours depending on the caloric density of the food,¹² meaning that between 10 and 30 percent will remain in the stomach 6 hours after ingestion.¹³ Gastric emptying is also delayed following opioid administration and in diabetic patients. In the pregnant population, gastric emptying is not delayed in healthy, term, nonlaboring patients.¹²⁻¹⁴ This is true for women with both a normal¹⁴ and a raised body mass index (BMI).¹⁵ Therefore, the obstetric anesthesia guideline approved by the American Society of Anesthesiologists' (ASA) House of Delegates in 2006 is that uncomplicated pregnant women undergoing elective cesarean delivery should adhere to the same preoperative fasting plan as nonpregnant women.¹⁶ This is to be fasted for 6 hours prior to an elective procedure with clear fluids up until 2 hours before.¹⁷

While the rate of gastric emptying in pregnancy is the same, several studies report that it is delayed in labor, as confirmed by bedside ultrasonography of the cross-sectional antral area,¹⁸ as shown in Figure 1.2, and acetaminophen absorption rates after delivery.¹² There is limited evidence on the recommended duration of fasting prior to emergency cesarean delivery, and given the unpredictable nature of labor, it would not be feasible to make guidelines for this. A more pragmatic approach would be to identify patients at greatest risk of requiring operative delivery and advise them on an individual basis.

Preoperative medications such as histamine-2 receptor antagonists are used frequently to increase gastric pH and reduce gastric volumes. In the nonpregnant adult population, they have been shown to significantly reduce gastric volume and increase gastric pH.¹⁹ However, their routine use for elective surgery in the healthy population is not recommended because they are not effective in all patients and are relatively slow acting and expensive.¹⁹ Pregnant women are thought, however, to be at high risk of aspiration because progesterone reduces the competency of the lower esophageal sphincter in the presence of increased intra-abdominal pressure from an enlarged uterus. A meta-analysis of 2,658 pregnant patients demonstrate that antacids, proton pump inhibitors, and histamine-2 receptor antagonists all significantly reduced the risk of gastric pH less than 2.5.²⁰ While these agents have not been proven to

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Figure 1.2 Gastric antral ultrasound demonstrating gastric volume in pregnancy

reduce morbidity or mortality, physiologically, their use seems justifiable. The NICE guideline for cesarean delivery (2011) recommends that women be given antacids and medications to reduce gastric acid prior to cesarean delivery.²¹

What Should Women Be Told?

Women should be informed that they have a choice whether to have food or drink in labor. They should be warned that labor itself or drugs given for analgesia may influence their appetite. It is not necessary to consume calories if they do not wish to because there is no proven benefit in doing so. Labor and/or the drugs given may also increase the risk of nausea and vomiting. If patients do wish to drink, they should be advised to take isotonic calorific fluids. If they wish to eat, they should be advised to choose low-residue foods. They can be informed that the risks of oral intake in labor are extremely low. If the risk of operative delivery increases due to circumstances of labor, patients may be advised to go NPO and be given interventions such as antacids to reduce the risk of aspiration. Women can be informed that the risk of aspiration is related to having general anesthetics,

which are rarely given in labor because most procedures can be performed using regional anesthesia.

Summary

In summary, fasting in labor is not known to be harmful to mother or baby. Aspiration is an extremely rare event, but whether this justifies the risk of relaxing recommendations on oral intake in low-risk laboring women remains unknown. As in this case, it is probably justifiable to allow normal, low-risk women to eat a light diet if they are informed of the risks and they wish to do so. However, close attention is required because this risk may change throughout labor. In this case, the patient received diamorphine, and there were signs of fetal compromise. Therefore, she should have been advised not to eat. Practices that reduce this risk, such as optimal premedication, ranitidine in this case, and senior clinician involvement, should be encouraged. In the absence of evidence demonstrating that eating in labor is safe, it would be prudent for patients at higher risk of requiring a general anesthetic, such as patients with a high BMI or anticipated difficulty with regional anesthesia, to be advised not to eat. Carbohydrate drinks may be a suitable alternative to provide some maternal comfort.

Learning Points

- Feeding or fasting during labor is not known to be harmful to mother or baby in normal labor.
- Aspiration is an extremely rare event; this probably justifies relaxing recommendations on oral intake in low-risk laboring women.
- Steps to reduce risk such as preoperative medication to reduce gastric pH and volume and senior clinician involvement are encouraged in women with risk factors including the risk of anesthesia.

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