Risks of aspiration in pregnant women undergoing non-obstetric procedures: intubate or not?

Pregnant women occasionally require anaesthesia during pregnancy for a range of indications and also immediately postpartum as a result of a complication of the birth or for tubal ligation. The surgical procedure may itself increase aspiration risk through the adoption of lithotomy or Trendelenberg positions or the creation of a pneumoperitoneum.

There is no specific high level evidence relating to the stage of pregnancy at which women should be considered at risk of acid aspiration during anaesthesia.

Risk of aspiration depends on factors which influence gastric volume and pH, opioid effects, the experience of the anaesthetist and maternal obesity (McClure and Cooper, 2005; Lewis, 2007; Australian and New Zealand College of Anaesthetists, 2008). In this context, attempts at stating a specific incidence and defining possible underlying factors are problematic. As a starting point, parturients are at increased risk from aspiration of gastric contents secondary to hormonal and mechanical factors.

Evidence suggesting high risk of aspiration

Pregnant women are at increased risk of aspiration because of gastro-oesophageal reflux and delays in gastric emptying. Gastro-oesophageal reflux is common in pregnancy and can be demonstrated even in the absence of symptoms. There is no difference in basal and evoked gastric acid secretion in pregnancy but there is a reduction in lower oesophageal barrier pressure which is likely to be a progesterone effect present from early pregnancy (Van Thiel et al, 1977; Bainbridge et al, 1984).

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Gastric emptying was studied indirectly by paracetamol absorption in 20 patients at 8–12 weeks' gestation and 20 non-pregnant controls. Subjects received a paracetamol 1.5 g tablet with 50 ml water and remained semi-recumbent for 2 hours while venous blood samples were taken at 15 minute intervals. The maximum concentration of paracetamol was significantly lower, the time to maximum concentration significantly greater and the areas under the time-concentration curves at 60 and 120 minutes were significantly smaller in the pregnant group. These changes indicate a delay in gastric emptying at 8–12 weeks' gestation as shown by Levy et al (1994).

Evidence suggesting low risk

Current evidence is inconclusive regarding intra-abdominal pressure and anatomical displacement during pregnancy as contributors to reflux. A study assessing gastro-oesophageal reflux and regurgitation during general anaesthesia for termination of pregnancy found that patients with preoperative symptoms of gastro-oesophageal reflux had no greater incidence of reflux during anaesthesia than those without symptoms. This suggests that the need for rapid sequence induction is no greater in the second trimester than the first (Vanner, 1992).

Third trimester and labour

A consistent finding is that pregnancy itself does not significantly delay gastric emptying. However, a number of factors have been shown in different contexts to be associated with significant delays in gastric emptying and combined effects may be greater. Hence it is likely that a pregnant woman will exhibit delayed gastric emptying when she is not fasted, in labour, obese, in pain, or has recently received opioids.

Relaxation of the lower oesophageal sphincter has been described, but the upper oesophageal sphincter is not affected by progesterone as it is believed to be formed from striated muscle. Induction of general anaesthesia may reduce upper oesophageal sphincter tone, increasing the risk of aspiration.

There is a potential of developing airway complications after a regional anaesthetic and also at the time of emergence from anaesthesia not only at induction.

Conclusions

In view of the relative safety of airway protection measures, clinical practice based on weighing the risk:benefit ratio favours a low threshold for airway protection. It is reasonable to use aspiration prophylaxis for anaesthesia for all women in their second trimester and onwards, or in any symptomatic pregnant woman whose symptoms might indicate liability for regurgitation and aspiration of gastric contents. In the postpartum period this applies up to 18 hours post delivery. The presence of symptoms beyond this period or other preoperative fasting precautions should be taken into consideration when a decision is taken. BJHM

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