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Title : ASPIRATION RISK WITH ABORTION-EFFECT OF METOCLOPRAMIDE

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The aims of this study were: 1) to establish whether in early pregnancy, as in late pregnancy, there is a significant risk of pulmonary aspiration, and 2) to assess whether metoclopramide, a new antiemetic agent said to accelerate gastric emptying, reduces this risk by decreasing gastric volume.

Methods: Gastric volume and pH were measured in three groups of healthy females undergoing general anesthesia. The study was approved by the Stanford Human Subjects Committee and informed consent was obtained from all participants. Group I consisted of non-pregnant women having minor gynecological surgery; Group II, pregnant patients (8-20 weeks gestation) having therapeutic abortions; and Group III, patients also having abortions, who additionally received metoclopramide, 10mg, intravenously 15-30 min before anesthesia. The initial phase of the study was designed primarily to compare control patients (Group I, n=11) with abortion patients (Group IIa, n=42). However, as a pilot project, metoclopramide was administered to 10 patients (Group IIIa). In the second part of the study, treatments were randomized and administered double blind, with abortion patients receiving either saline, 2 ml (Group IIb, n=10), or metoclopramide, 10 mg, (Group IIIb, n=10) intravenously before anesthesia. All patients were NPO for at least 10 hr prior to anesthesia. After administration of fentanyl, 50-100 µg, anesthesia was induced with thiopental, 4-7 mg/kg; endotracheal intubation was performed following succinylcholine administration. Following intubation, an 18g Salem-Sump tube was introduced into the stomach and its position confirmed by auscultation of insufflated air. Gastric contents were aspirated, with maximal retrieval facilitated by changing the position of the patient and the nasogastric tube. The volume and pH of the aspirate were measured. Data were analyzed using Student's t-test and chi-square analysis (Fischer's exact test). A gastric volume greater than 25 ml and a pH less than 2.5 were considered to be risk factors with respect to aspiration.[1]

Results: Mean gastric volume, pH, and the proportion of patients "at risk" (volume greater than 25 ml, pH less than 2.5, or the presence of both factors) were similar in Groups IIa and IIb, and in Groups IIIa and IIIb. Therefore, data in these sub-groups were combined to constitute Groups II and III respectively. There was no difference among the three groups with respect to mean gastric pH or the number of patients with a pH less than 2.5 (Table). Gastric volume was similar in Groups I and II, but was significantly less in Group III than in either of the other groups. The number of patients having gastric volumes greater than 25 ml was significantly lower in Group III than in Group II. Significantly fewer of the patients who received metoclopramide had a gastric pH less than 2.5 and a volume greater than 25 ml, compared with the other groups. No side effects of metoclopramide have become apparent in this study to date.

Discussion: Although no additional risk of pulmonary aspiration was demonstrated in early pregnant patients as compared with non-pregnant surgical patients, a surprisingly high percentage of all patients appear to be at risk. Much attention has been focused on gastric acidity, yet it is known that alkaline and neutral particulate-containing aspirates may also cause severe pneumonitis. Gastric volume can never be accurately measured following aspiration, yet may be crucial in determining which patients regurgitate and aspirate. Metoclopramide was rapidly effective at decreasing gastric volume, with no significant side effects. Metoclopramide is also an antiemetic and increases gastro-esophageal sphincter tone. Thus all of its actions are of potential benefit during anesthesia, particularly for the patient at high risk from pulmonary aspiration.

Table

	Group I Non-pregnant (n=11)	Group II Abortion (n=52)	Group III Metoclopramide-abortion (n=22)
MEAN pH	1.9 ± 0.5	2.4 ± 0.2	2.2 ± 0.3
pH<2.5	10 (91%)	37 (71%)	15 (71%)
MEAN VOL ml	29 ± 6	28 ± 2	15 ± 3*†
VOL>25 ml	4 (36%)	29 (56%)	2 (9%)†
pH<2.5 & VOL>25ml	4 (36%)	20 (38%)	1 (5%)*†

*p < 0.05 vs I. †p < 0.005 vs II.

Reference

1. Roberts RB, Shirley MA: Reducing the risk of acid aspiration during cesarean section. Anesth Analg 53:859-868, 1974