

# SINGLE DOSE ANTACID THERAPY BEFORE CAESARIAN SECTION

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## SUMMARY

*The severity of pulmonary aspiration depends mainly on the acidity of the aspirate. Mist. magnesium trisilicate (MMT) has been used for many years at the maternity unit in General Hospital, Kuala Lumpur, to neutralise the acidic gastric contents in all obstetric patients requiring caesarian section. This preliminary study shows that a single dose of 15 mls of MMT before general anaesthesia raises the intragastric pH to above the critical level of 2.5 in 80% of the patients. Recently there have been doubts over the protective role of MMT. Sodium citrate which is the other antacid available may be a better alternative.*

## INTRODUCTION

The most dreaded complication confronting an anaesthetist when dealing with an obstetric patient requiring caesarian section is pulmonary aspiration of gastric contents. It has been conclusively established through experimental work<sup>1</sup> that the severity of the lung damage is determined mainly by the pH (acidity) of the aspirate. In one reported series<sup>2</sup> of 18 patients who developed acid aspiration

syndrome, 12 out of 15 whose aspirate pH was less than 2.4 died and all three whose aspirate pH was over 2.4 survived. Mendelson's syndrome is a term used to describe a particularly fulminant form of aspiration pneumonitis occurring when the pH of the aspirate is below the critical level of 2.5.

Since 1966,<sup>3</sup> mist. magnesium trisilicate (MMT) has been used to neutralise the acidic gastric contents. At the maternity unit in General Hospital, Kuala Lumpur, all patients presenting for caesarian section are given 15 mls of MMT within 30 minutes before surgery. This study is done to test the effectiveness of this single dose of MMT in reducing the gastric acidity and thus minimising the risk of Mendelson's syndrome.

## METHOD

Two groups of 30 obstetric patients each were studied.

### Control Group

This consisted of patients in established labour, but not likely to require caesarian section. No MMT had been given. Permission was obtained from these patients for a Ryle's tube to be inserted. About 10 mls of the gastric fluid was aspirated using a 20 ml syringe and the contents emptied into a bottle. The pH of the fluid was measured using a pH meter (Radiometer PHM 82).

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## Study Group

This consisted of patients requiring general anaesthesia for emergency caesarian section and 15 mls of MMT had been given before surgery. A Ryle's tube was inserted during general anaesthesia through which the stomach was emptied as much as possible but only 10 mls of the gastric fluid were collected and analysed for its pH. After sampling, the Ryle's tube was removed.

## RESULTS

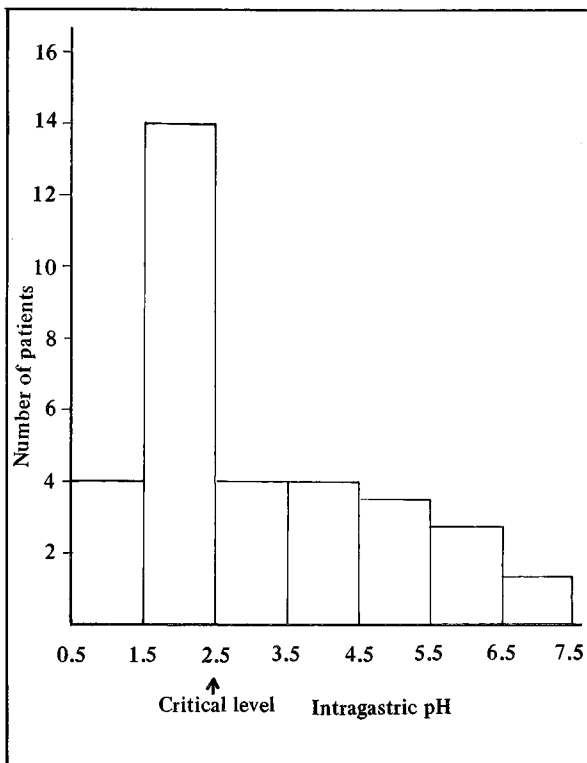


Fig. 1 Intragastric pH of 30 women not given MMT

TABLE I  
VALUES OF INTRAGASTRIC PH

	Control Group	Study Group
Mean pH	3.09	6.05
S.D.	1.51	2.70
Range	1.2 - 6.6	1.3 - 8.6

Study group compared to control group :  $p < 0.001$ .

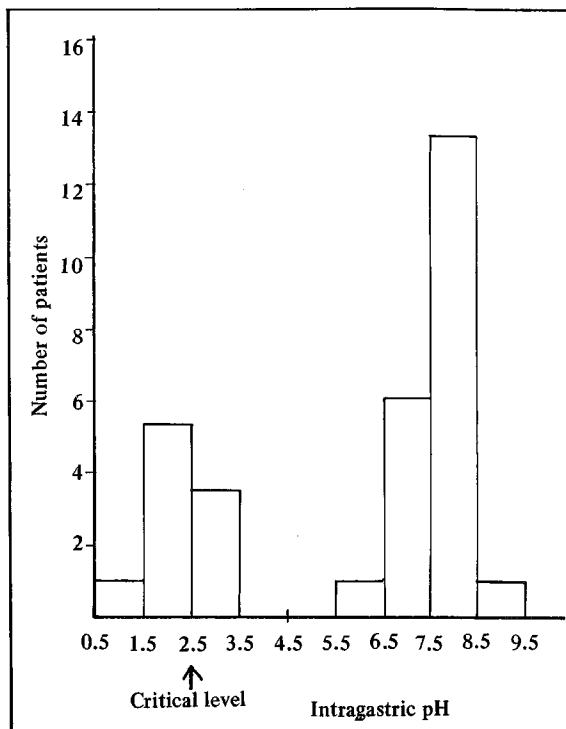


Fig. 2 Intragastric pH of 30 women given MMT

TABLE II  
NUMBER OF WOMEN WITH INTRAGASTRIC PH  
BELOW 2.5

	pH $\leq$ 2.5	pH $>$ 2.5	Total
Control group	16	14	30
Study group	6	24	30

Study group compared to control group :  $p < 0.01$ .

## DISCUSSION

More than half (53%) of the patients in the control group have intragastric pH below the critical level of 2.5 and therefore stand a high risk of developing Mendelson's syndrome should pulmonary aspiration occur. A single dose of MMT given before general anaesthesia reduces this risk quite significantly with one-fifth (20%) of the patients in the study group having an intragastric pH of less than 2.5.

Crawford<sup>4</sup> recommended the use of 15 mls. of MMT at two-hourly intervals for every patient in

established labour and an additional 30 mls shortly before general anaesthesia. The regime is practised widely in United Kingdom, but may not be feasible in this hospital where the number of deliveries averages<sup>5</sup> 50–60 per day. This would only impose an extra burden on the already overworked nursing staff. Single dose therapy would be more practical here.

Recently there were reports<sup>6</sup> of patients dying from Mendelson's syndrome despite being given adequate antacid therapy. Why is MMT not completely effective? It has been suggested<sup>7</sup> that being particulate in nature, it is difficult for MMT to mix evenly with the gastric contents giving rise to pockets of unneutralised gastric contents. If these get aspirated they are acidic enough to produce severe reactions in the lungs. It should also not be assumed that neutralization of acidic gastric contents with MMT renders their aspiration harmless. Experimental work on animals<sup>8</sup> has shown that inhalation of the alkali alone or alkali-neutralised gastric contents can of themselves produce extensive reactions in the lungs. This is again due to the particulate matter of emulsion alkali. Therefore the MMT-treated patient who aspirates cannot be casually treated but should receive the same skilled management as the patient who aspirates unmodified gastric contents.

A better alternative may be sodium citrate. Being non-particulate it mixes more evenly with the gastric contents and even if aspirated may not cause so much lung damage. The recommended dose<sup>9</sup> is 15 mls of 0.3 molar solution given 5–15 minutes before induction of anaesthesia. Some workers<sup>10,11</sup> found it to be very effective. At the moment there is no stock of 0.3 molar solution in the pharmacy but producing it is neither difficult nor expensive. When available, a follow-up study would be conducted to determine whether sodium citrate is more effective than MMT as claimed by others. If so, it should be the antacid of choice replacing MMT.

The other method of reducing gastric acidity is the use of H<sub>2</sub> antagonists. There are now numerous reports on the efficacy of cimetidine<sup>12,13</sup> and ranitidine<sup>14,15</sup> in increasing the intragastric pH

above the critical level but like antacids, they are not reliable in every patient. Nonetheless, the best solution of avoiding Mendelson's syndrome is to prevent gastric contents from entering the lungs and this comes with good anaesthetic care.

## CONCLUSION

A single dose of MMT does not guarantee a safe intragastric pH in every patient and even when it does, aspiration of MMT neutralised gastric contents may not be entirely harmless. Even then, it is still considered a dangerous practice to withhold this prophylactic measure unless other alternatives like sodium citrate or H<sub>2</sub> antagonists are available.

## ACKNOWLEDGEMENT

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