ORIGINAL ARTICLE

Gastric Residual Volume in Adults; Comparison of Erythromycin and Metoclopramide as Prokinetic Agents

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ABSTRACT

Objective: To evaluate the effects of pre-operative erythromycin and metoclopromide on gastric residual volume in patients undergoing elective surgery and effectiviness of erythromycin as alternative of metoclopromide.

Methods: In this experimental study 120 patients of ASA P1 & P2 status, age 17 to 50 years of both sex undergoing general anaesthesia for elective surgery were selected and divided in two groups (60 each) and asked not to eat solid food 8 hours, and liquids 3 hours. No premedication was given. Group I received oral metoclopramide 10mg 2 hours before surgery with 10ml of water. Group II received oral erythromycin 250mg 2 hours before surgery with 10ml of water. Blind aspiration through (18F) orogastric tube done after induction of general anaesthesia with 50 cc syringe and volume were recorded on proforma.

Results: Group I (Metoclopamide) had mean gastric fluid volume 11.07 $\pm$ 6.68 ml and group II (erythromycin) 8.32 $\pm$ 5.76. The P value was .017 which is statistically significant.

Conclusion: Both drugs reduce gastric fluid volume but the effect of erythromycin (250mg) is more pronounced than metoclopramide (10mg) and can be used as an alternative to metoclopramide

Key words: Erythromycin, Metoclopramide, Gastric Volume, General Anaesthesia.

INTRODUCTION

Pulmonary aspiration of gastric contents is one of the leading cause of anaesthesia related deaths. The patients under general anaesthesia are prone to regurgitation and aspiration of gastric contents due to loss of protective airway reflexes.

Attempts have been made to decrease the gastric fluid volume these include overnite fasting, nasogastric aspiration, H_2 receptor antagonists and prokinetic drugs.

Prokinetic agents have been used to enhance gastric emptying and reduce gastric residual volume examples are Metoclopramide[1], Erythromycin[2], Azithromycin[3], Tegaserod[4], and Renzapride[5].

Metoclopramide is widely used for this purpose and is a standard prophylactic agent but it may cause extrapysamidal reactions especially in children and young adults[6] and patients suffering from parkinsons disease.

It is also contraindicated in patients who are on MAO inhibitors and tricyclic antidepressants Erythromycin is a macrolide antibiotic and motilin agonist[7]. In low doses[8] (subtherapeutic) it accelerates gastric emptying for both solids and liquid in healthy volunteers, neonaters[9], critically ill patients[10] and patients suffering from diabetic gastroparesis[11] it is also an inexpensive prokinetic alternative[12] agent.

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METHODS

After the approval of study from the hospital ethics committee 120 patients of ASA P1 and P2 status, age 17 to 50 years of both sex undergoing general anaesthesia for elective surgery were included in the study. Informed consent was taken from all patients. Patients were divided in two groups (60 each). They were asked not to eat solid food 8 hours before the start of surgery. No premedication was given to avoid any possible effect on gastric emptying.

Group I received oral metoclopramide 10mg 2 hours before surgery with 10ml of water. Group II received oral erythromycin 250mg 2 hours before surgery with 10ml of water. After induction and intubation a multiorifice orogastric tube (18F) was passed in the stomach and confirmed by injecting few ml of air and listening over the epigastrium with stethoscope. Gastric fluid was aspirated gently by 50cc syringe attach to orgastric tube. The suction was facilitated by pressing at three different points at epigastric and also by putting the patients in head up, head down, right lateral and left lateral position. The aspirate was collected in a bowl and volume recorded.

Pregnant patiens, patients suffering from upper gastrointestinal disease eg reflux hiatus or acide peptic disease were excluded. Patients who were administered opioids anticholinergics, H_2 blockers and any other prokinetic agent were also excluded. For sampling of patients proposive non probability

technique was used and this was prospective analytic study and P value <0.05 was considered significant.

RESULTS

In our study we use SPSS version 10 for data analysis. Student's unpaired T test was applied and T test was done for equality of means. Regarding age in group I range was 17-50 year and mean age 31.03 ± 0.737 Inj group II range was 17-48 years mean age was 30.17 ± 9.37 P value was 0.737 (not significant) Regarding weight in group I range was 37-70 kg and mean was 56.87 ± 8.29 kg. In group II range was 38-70 kg and mean was 55.43 ± 8.26 kg P value was 0.345 (not significant).

Male to Female ratio in group I was 32:28 and in group II it was 34:26.

Regarding gastric fluid volume aspirated in group I it was 11.07 ± 6.68 and in group II it was 8.32 ± 5.76 and P value was 0.017 and it is statistically significant so effect of erythromycin was more pronounced than metoclopramide

Table 1: Age (years)

Drugs	n	Range	Mean	S.D.	S.E.M.
Metoclopramide	60	17-50	31.03	11.10	1.43
Erythromycin	60	17-48	30.16	9.72	1.26

P-value = 0.737

Table 2: Weight (Kg)

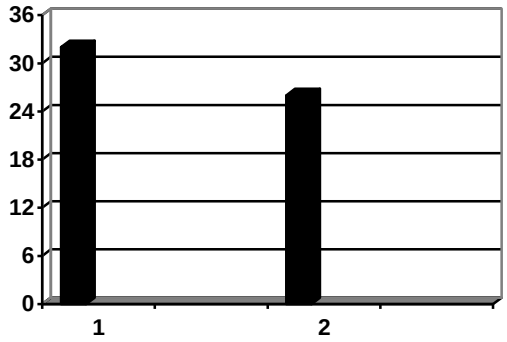
Drugs	n	Range	Mean	S.D.	S.E.M.
Metoclopramide	60	39-70	56.87	8.29	1.07
Erythromycin	60	38-70	55.43	8.26	1.07

P-value = 0.345

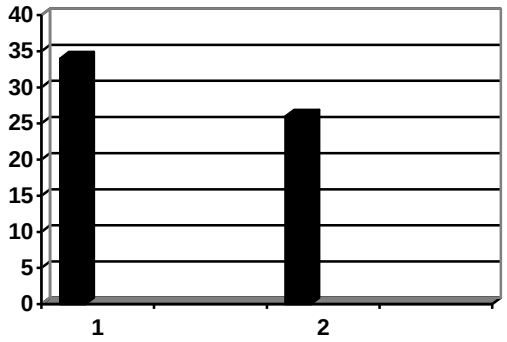
Table 3: Gastric fluid volume (ml)

Drugs	N	Mean	S.D.	S.E.M.
Metoclopramide	60	11.07	6.68	0.86
Erythromycin	60	8.32	5.76	0.74

P-value = 0.017

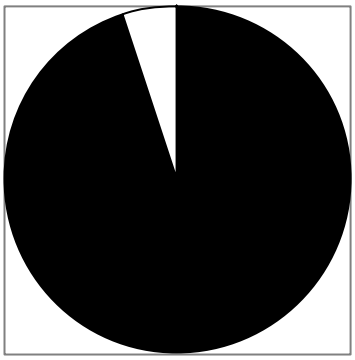


Graph 1: Male : Female (Metoclopramide)



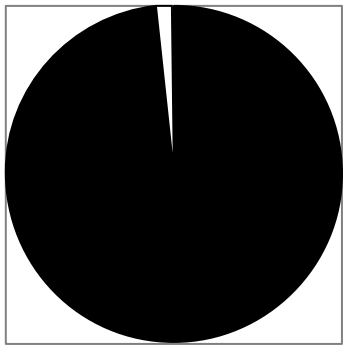
Graph 2: Male : Female (Erythromycin)

Metoclopramide

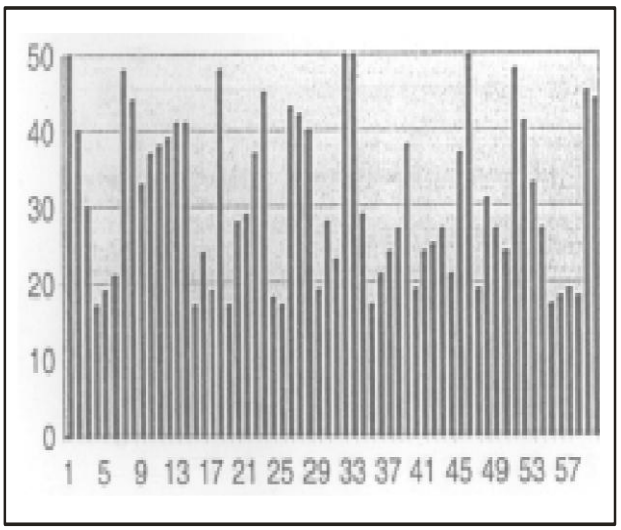


Graph 3: Patients with gastric aspirate below critical level (25ml) 95%

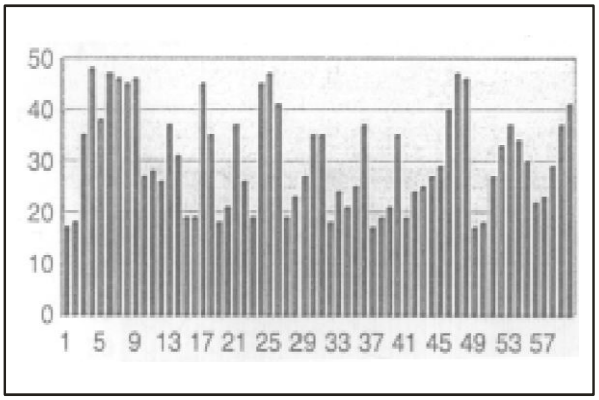
Erythromycin



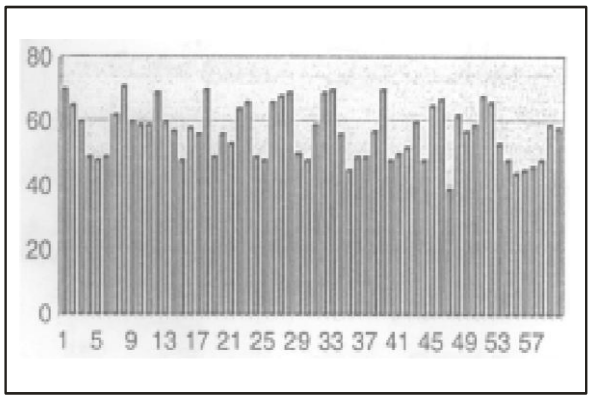
Graph 4: Patients with gastric aspirate below critical level (25ml) 98.3%



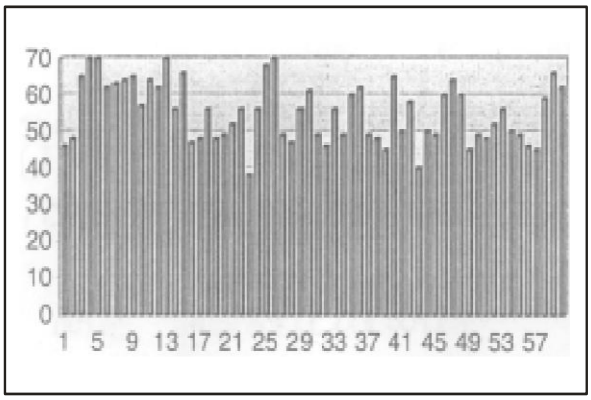
Graph 5: Metoclopramide (age distribution)



Graph 6: Erythromycin (age distribution)



Graph 7: Metoclopramide (Weight distribution)



Graph 8: Erythromycin (Weight distribution)

DISCUSSION

Pulmonary Aspiration of gasric contents is always of concern to the anaesthetist. Aspiration pneumonitis was first noted by John snow in 1858[13] and in 1946 an American obstetrician Cruitis Mendelson[14] described the pathophysiology of acid aspiration syndrome, in detail and it is now known as Mendelson syndrome patients with gastric fluid volume above a critical level (25ml) and pH below 2.5

are particularly considered to be at high risk of developing acidic aspiration syndrome.

In our study we compare the prokinetic effect of erythromycin with conventionally using metoclopramide. The purpose was to establish the role of erythromycine as an alternative drug to reduce the gastric residual volume. In our study we found that erythromycin in sub-theraputic was more effective than metoclopramide.

In the study of Nguyen NQ et al[15] they found that erythromycin was more effective than metoclopramide. Similarly in the study of Sallam HS et al[16] they found that erythromycin improves gastric emptying.

Similarly in the study of Ridley EJ and Davies AR[17] they also proves the role of erythromycin in intensive care unit.

Similarly study of Nguyen NQ et al[18] also proves the effect of low dose erythromycin as prokinetic agent.

The study of Lightfoot AJ et al[19] shows that erythromycin is not improving post operative bowel function and his result are not favouring our study. Similarly results of Onoma M et al[20] study also in favour of our study. At the end we conclude that both drugs are causing significant increase in gastric emptying but erythromycin has more strong effect than metoclopromide and is better alternative for metoclopromide and other macrolid salts like azithromycino are also under trials.

CONCLUSION

A significant reduction in gastric residual volume was observed in both groups and majority of patients (more than 95%) had gastric residual volume below critical level (25ml) after pretreatment with metoclopramide and erythromycin but erythromycin enhance the gastric emptying more than metoclopramide so it can be used as an alternative drug to metoclopramide for aspiration prophylaxsis in patients where extrapyramidal side effects limits the use of metoclopramide and in patients with parkinsons disease and patients taking Tricyclic anti-depressants and MAO inhibitors.

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