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Original Research Article

Efficacy of an alginate versus proton pump inhibitor in the symptomatic relief of gastroesophageal reflux symptoms in pregnant women

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ABSTRACT

Background: Gastroesophageal reflux disease (GERD) is frequently seen during pregnancy with prevalence of 80%. Proton pump inhibitors (PPI) are the most effective drugs used in the treatment of reflux symptoms. Alginates are natural polysaccharide polymer which builds a non-systemic barrier against acid and food reflux in the oesophagus. Aims and objectives were to compare the efficacy of alginate versus PPIs in pregnant women, and to determine the time to onset of decrease in the pain intensity of alginate to PPIs.
Methods: This is a prospective randomised study conducted in pregnant women with symptoms of heartburn comparing the efficacy of alginates to PPIs in Kempegowda Institute of Medical Sciences. After subjects have signed the consent, two sachets of 10 ml liquid preparation alginate were given to the alginate group while 40 mg intravenous pantoprazole to the PPI group.
Results: Among 40 patients studied, 20 were given alginates and 20 were given PPIs. 7 presented in the 1st trimester and 33 in 2nd trimester. Onset of action is faster with alginates when compared to PPIs, it was 30 min to 1 hour in patients taking alginates and 6-12 hours in patients taking PPIs, duration of action was longer for PPIs than alginates, with alginates it's observed that it attains 24-hour symptom free interval in shorter time when compared to PPIs.
Conclusions: ¬Alginates to be used for rapid symptom relief in patients with acute symptoms as an induction agent, PPIs to be used for longer duration of action as maintenance.

Keywords: Alginates, Pantoprazole, GERD, Heartburn

INTRODUCTION

Gastroesophageal reflux disease (GERD) is frequently seen during pregnancy. GERD is one of the most typical medical conditions among expectant mothers. In some populations, it has been claimed to be up to 80% prevalent.[1-3]

Heartburn is a symptom that can be seen in 30-40% pregnancies. As pregnancy advances GERD becomes more apparent.[4,5]

Heartburn during pregnancy can be brought on by hormonal changes that disrupt normal stomach motility, increased intra-abdominal pressure from the expanding uterus, a slower rate of digestion, or weight gain as the pregnancy goes on. These factors can all result in acid reflux.[6-12]

Gestational age, heartburn before to pregnancy, and multiparity are among the reported risk factors for heartburn during pregnancy. Older maternal age appears to have a protective effect. Heartburn symptoms during pregnancy are the same as the standard presentation in the

broader adult population. The most common symptom is heartburn, which gets worse as the pregnancy goes on. Heartburn and regurgitation both happen occasionally. The majority of patients claim that eating and going to bed make their symptoms worse.

Basal lower esophageal sphincter (LES) pressure may not change in the first trimester. This is due to the low response to physiological stimuli. LES pressure may decrease to 33-50% of basal values in the second and third trimesters.

Decrease in this LES pressure can be observed due to the elevated intra-abdominal pressure, increased progesterone, abnormal gastric discharge or delayed intestinal transit.[13,14] Proton pump inhibitors are the most effective drugs used in the treatment of reflux symptoms and esophagitis. Data on the safety of these drugs is more restricted.

Heartburn during pregnancy has been treated using a variety of methods. Medication, dietary changes, and lifestyle modifications are a few of these approaches. Antacids, sucralfate, histamine 2-receptor antagonists, proton pump inhibitors, and a raft-forming alginate reflux suppressor are common medications used to alleviate heartburn during pregnancy.[8] However, no recommendation based on evidence has been made to relieve heartburn in pregnant women.

Alginates are natural polysaccharide polymer which builds a non-systemic barrier against acid and food reflux in the oesophagus.[15]

Aim

Aim of the study was to compare the efficacy of alginate versus proton pump inhibitor in pregnant women.

Objective

Objective of the study was to determine the time to onset of decrease in the pain intensity of alginate to PPIs.

METHODS

Study type

This is a prospective randomised study conducted in all pregnant women with symptoms of heartburn comparing the efficacy of alginates to PPIs.

Study place

The study was conducted at the Kempegowda Institute of Medical Sciences.

Study period

The period of the study was for 4 months (September 2022 to December 2022).

Inclusion criteria

All pregnant women with presence of heartburn or regurgitation symptoms were included in the study.

Exclusion criteria

Pregnant women with previous history of gastric or duodenal ulcer were excluded from the study.

Study method

Participants will receive either alginates or proton pump inhibitors.

After subjects have signed the consent, two sachets of 10 ml liquid preparation alginate were given to the alginate group while 40 mg intravenous pantoprazole to the PPI group.

To determine the time to onset of decrease in the pain intensity of the alginate to PPIs.

Statistical analysis

Mann Whitney test was used to compare the mean age, gestational age, onset of action and 24-hour symptom free interval between two groups. Chi square test was used to compare the side effects and effectiveness between two groups. The level of significance (p value) was set at $p<0.005$.

RESULTS

Among 40 patients studied, 20 were given alginates and 20 were given PPIs. All belonged to the age group of 20-35 years, 14 were primigravida and 26 were multigravida. 7 presented in the 1st trimester and 33 in 2nd trimester. Onset of action is faster with alginates when compared to PPIs, it was 30 min to 1 hour in patients taking alginates and 6-12 hours in patients taking PPIs, duration of action was longer for PPIs than alginates, with alginates it's observed that it attains 24-hour symptom free interval in shorter time when compared to PPIs.

Age distribution

In the present study, majority of the patients among alginate group, 12 out of 20 (60%) were in the age group of 20-25 years and majority of the patients in PPI group, 10 out of 20 (50%) were also in the same age group (Table 1 and Figure 1).

Gestational age at presentation

In this present study, majority of the patients belonged to the gestational age of 21-25 weeks, among 40 patients 8 of them received alginates and 9 of them received PPIs (Table 2 and Figure 2).

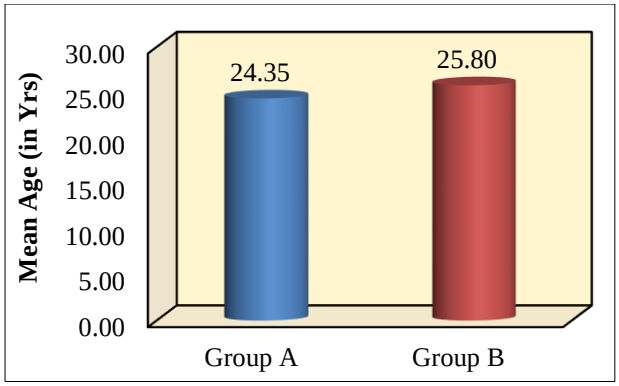

Figure 1: Age wise distribution between 2 groups.

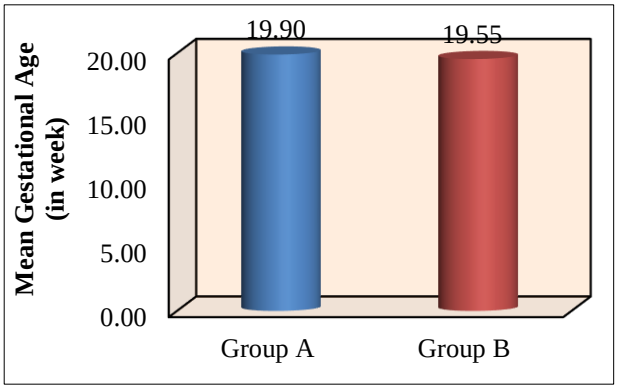

Figure 2: Mean gestational age (in weeks) between 2 groups.

Onset of action

The onset of action is shorter for alginates when compared to PPIs. 9 patients who received alginates had onset of action within 6-hours, 4 patients who received PPIs had onset of action within 12-hours. Majority in alginate group (4%) had onset of action as early as within 6hrs and majority in PPI group (60%) had onset of action between 12-24-hours (Table 3 and Figure 3).

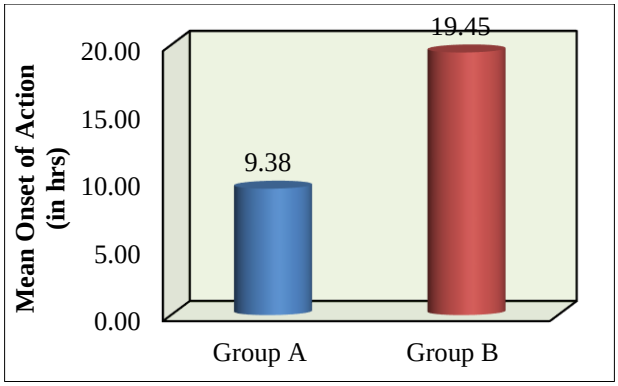

Figure 3: Mean onset of action (in hours) between 2 groups.

24-hour symptom free interval

Present study showed 24-hour symptom free interval for alginates within a day and majority among alginate group, 14 out of 20 (70%) showed it within 1-2 days, 24-hour symptom free interval started within 2 days, majority among PPI group, 12 out of 20 (60%) showed it within 2-3 days (Table 4 and Figure 4).

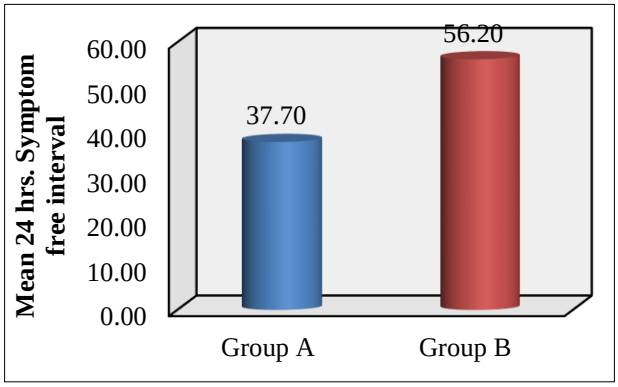

Figure 4: Mean 24-hours symptom free interval between 2 groups.

Table 1: Comparison of mean age (in years) between 2 groups using Mann Whitney test.

Parameter	Drug	N	Mean	SD	Mean difference	P value
Age	Group A	20	24.35	4.02	-1.45	0.20
	Group B	20	25.80	3.90		

Table 2: Comparison of mean gestational age (in weeks) between 2 groups using Mann Whitney test.

Parameter	Drug	N	Mean	SD	Mean difference	P value
Gestational age	Group A	20	19.90	4.38	0.35	0.91
	Group B	20	19.55	4.40		

Table 3: Comparison of mean onset of action (in hours) between 2 groups using Mann Whitney test.

Parameter	Drug	N	Mean	SD	Mean difference	P value
Onset of action	Group A	20	9.38	6.10	-10.07	<0.001*
	Group B	20	19.45	6.21		

*Statistically significant

Table 4: Comparison of mean 24-hours symptom free interval between 2 groups using Mann Whitney test.

Parameter	Drug	N	Mean	SD	Mean difference	P value
24-hours symptom free interval	Group A	20	37.70	16.00	-18.50	0.004*
	Group B	20	56.20	20.83		

*Statistically significant

Side effects

In the present study alginates was well tolerated by most of the patients, 2 out of 20 (10%) had side effects of nausea, whereas in PPI group 2 (10%) had nausea, 2 (10%) had constipation, 2 (10%) had bloating (Table 5 and Figure 5).

Table 5: Comparison of side effects between 2 groups using Chi square test.

Side effects	Group A		Group B		P value
	n	%	n	%	
Nausea	2	10.0	2	10.0	0.21
Constipation	0	0.0	2	10.0	
Bloating	0	0.0	2	10.0	
Nil	18	90.0	14	70.0	

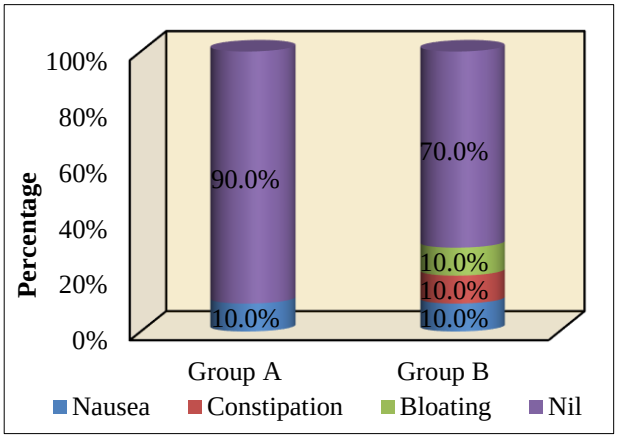

Figure 5: Distribution of side effects between 2 groups.

Table 6: Comparison of effectiveness between 2 groups using Chi square test.

Effectiveness	Group A		Group B		P value
	n	%	n	%	
Poor	0	0.0	2	10.0	0.04*
Acceptable	3	15.0	7	35.0	
Good	9	45.0	9	45.0	
Very good	8	40.0	2	10.0	

*Statistically significant

Effectiveness of the drug (subjective)

After 2 weeks of treatment, majority of the patients in alginate group, 8 out of 20 (40%) reported as very good and 7 (35%) of them reported as good, majority of the patients in PPI group 9 out of 20 (45%) reported as good and 7 (35%) reported as satisfactory.

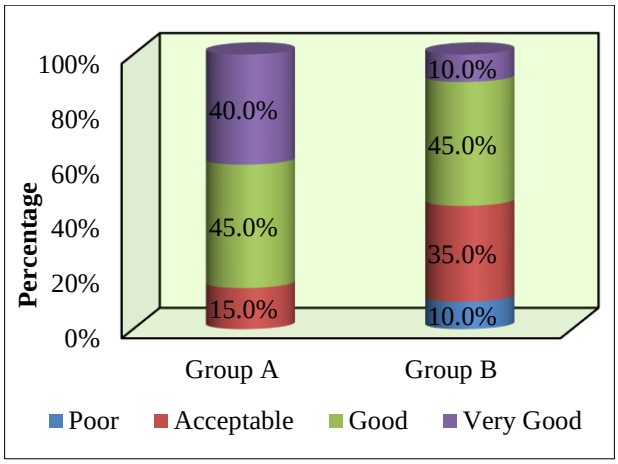

Figure 6: Distribution of effectiveness between 2 groups.

DISCUSSION

This prospective randomised study compared the efficacy of alginates to PPIs in symptomatic relief of gastroesophageal reflux disease.

In our study maximum number of patients were in the age group of 20-25 years, 12 in the alginate group out of 20 (60%), 10 in the PPI group out of 20 (50%) belonged to this age group.

In this present study, majority of the patients belonged to the gestational age of 21-25 weeks.

Present study showed 24-hour symptom free interval for alginates within a day and majority among alginate group, 14 out of 20 (70%) showed it within 1-2 days, 24-hour symptom free interval started within 2 days, majority among PPI group, 12 out of 20 (60%) showed it within 2-3 days.

In a similar study in non-pregnant patients, 278 patients were recruited; 120 were included in the Gaviscon® group and 121 in the omeprazole group for the per protocol non-inferiority analysis. The mean time to onset of the first 24-hour heartburn-free period after initial dosing was 2.0 (±2.2) days for Gaviscon® and 2.0 (±2.3) days for omeprazole (p=0.93); mean intergroup difference was 0.01±1.55 days (95% CI=-0.41 to 0.43): i.e., less than the

lower limit of the 95% CI of -0.5 days predetermined to demonstrate non-inferiority.[16]

A French open-label trial followed 50 pregnant women with reflux in the second and third trimesters treated with Gaviscon.[17] All symptoms were significantly improved, including frequency, intensity, and duration of reflux symptoms with 98% positive efficacy.

In the present study, the onset of action is shorter for alginates when compared to PPIs. 9 patients who received alginates had onset of action within 6-hours, 4 patients who received PPIs had onset of action within 12-hours. Majority in alginate group (45%) had onset of action as early as within 6-hours and majority in PPI group (60%) had onset of action between 12-24 hours.

In the present study, after 2 weeks of treatment, majority of the patients in alginate group, 8 out of 20 (40%) reported as very good and 7 (35%) of them reported as good, majority of the patients in PPI group 9 out of 20 (45%) reported as good and 7 (35%) reported as satisfactory.

Pregnant women (< or =38 weeks' gestation; n=150) aged 18-40 years suffering from heartburn were instructed to take Gaviscon advance 5-10 ml, as required, to relieve symptoms. The main outcome measures were the efficacy rating of the study medication by the investigator and women after four weeks using a five-point efficacy scale. After four weeks the investigators' and women's rating of efficacy was 'very good' or 'good' in 88% and 90% of women, respectively. Most women (57%, n=83) reported symptom relief within 10 minutes. Thus Gaviscon advance effectively and rapidly treats heartburn during pregnancy. Its use during pregnancy presents no known significant safety concerns for mother or child.[18]

Hutt et al carried out a drug-monitoring study of 52 women who were pregnant and had taken Gaviscon.[19] 98.1% considered the treatment effective, and it was well or satisfactorily tolerated by all women.

Lindow et al performed a formal safety and efficacy study using double strength product Gaviscon advance (open label and uncontrolled) to treat symptoms of heart-burn and regurgitation in pregnant women (n=146).[20]

Efficacy of the treatment was deemed very good or good by 90% of the women with symptom relief usually within 10 minutes of taking the medication. Frequency and severity of heartburn decreased both in the day and at night after treatment.

In the present study, alginates were well tolerated by most of the patients. 2 out of 20 (10%) had side effects of nausea, whereas among PPI group 2 (10%) had nausea, 2 (10%) had constipation and 2 (10%) had bloating.

An Italian study by De Bellis et al evaluated liquid Gaviscon suspension in 18 pregnant women during the second and third trimesters.[21] All patients had effective control of symptoms on average within 10–15 days of commencing treatment. The medication was well tolerated with no signs of hypernatraemia or other adverse reactions.

Limitations

The limitation of the study was that it was a short duration of the study.

CONCLUSION

Alginates to be used for rapid symptom relief in patients with acute symptoms as an induction agent and PPIs to be used for longer duration of action as maintenance. Alginates can benefit patients with GERD with rapid onset of action and almost no side effects, whereas PPIs can be used as a maintenance agent as it gives prolonged symptom free interval.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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