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Original Research Article

Gum chewing stimulates early return of peristalsis after caesarean section

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ABSTRACT

Background: The aim was to evaluate the efficacy and safety of postoperative gum chewing on the recovery of peristalsis after caesarean section. Study design was a randomized controlled study. Settings were at GMERS medical college and hospital, Sola, Ahmedabad. Population was total of 200 pregnant women who underwent caesarean section under spinal anaesthesia.
Methods: Women were randomized into two groups. Group A who received 1 chewing gum for 15 minutes every 2 hours post-surgery. Group B had traditional management (oral intake of clear fluids after 12 hours).
Results: The study group showed shorter mean interval time for return of bowel sounds, passage of flatus, passage of bowel motion and shorter hospital stay as compared to the control group.
Conclusions: Chewing gum is safe post-CS, well tolerated and associated with rapid return of intestinal motility and shorter hospital stay.

Keywords: Caesarean section, Early oral feeding, Gum chewing, Ileus, Post-operative

INTRODUCTION

Following caesarean section, usually oral feeding is started after resolution of postoperative ileus, often defined by passage of flatus and/or bowel movement. This has been based upon the concern about the possibility that early enteral feeding could exaggerate postoperative ileus. The exact cause of ileus is not known but it is more common in laparotomy and major abdominal surgeries which include breach of peritoneum, and especially those involving the bowel.[5,6] The risk factors include intra-operative bowel manipulation, anaesthetic agents, peri-operative narcotics and post-operative sympathetic hyperactivity.

Two of the most common causes of functional bowel obstruction following caesarean section are paralytic ileus and Ogilvie's syndrome.[1] Paralytic ileus occurs from prolonged hypomotility of gastrointestinal syndrome secondary to inflammation of intestinal smooth muscle.[2,3] Ogilvie's syndrome of acute colonic pseudo-obstruction (ACPO) is the clinical syndrome of acute large bowel dilatation in absence of mechanical cause.[4]

Sham feeding has been reported to stimulate bowel motility in humans.[9-11] Following colectomy, postoperative gum chewing, as a form of sham feeding, has been recently suggested as a safe way to provide the benefits of early stimulation of the gastrointestinal tract without the complications seen with feeding.[7,8] Gum chewing is thought to stimulate the cephalic-vagal reflex which indirectly stimulates the secretion of saliva and pancreatic juice which is thought to enhance the bowel activity. However, two recent randomised studies failed to show a beneficial effect of gum chewing after colectomy.[12,13] On the other hand, a recent randomised study suggests gum chewing to be effective in enhancing the recovery of bowel function after the caesarean delivery.[14]

In this study, we assess the hypothesis that gum chewing enhances return of bowel activity post caesarean section.

METHOD

This study was a randomized controlled trial that included 200 women undergoing caesarean section under spinal anaesthesia at GMERS medical college and civil hospital, Sola. This study was carried out in the months of July 2021 to January 2022, over a period of six months, after being approved by ethical and research committee of department of obstetrics and gynaecology at GMERS, Sola.

The study was explained to all the enrolled participants and their informed written consent was taken. Data was collected regarding patient's age, gravidity, parity, medical and surgical history, gestational age and indication for caesarean section. All the C-sections were carried out in the morning and all the operative data were recorded which included intra-operative complications, estimated blood loss and duration of surgery. Patients undergoing obstetric hysterectomy were excluded from the study. The nature of the study did not allow blinding after application of the assigned intervention postoperatively. Group A (study group) included 90 women who were asked to chew one gum for 15 minutes every 2 hours starting 2 hours post-surgery. During overnight sleep, there was no gum chewing. Compliance was monitored by counting the number of chewing gum left with the patient during the recording of vital data in post-operative period. Gum chewing was stopped when passage of flatus occurred. The women were then allowed oral intake of clear fluids followed by soft diet. Group B (control group) compromised of 110 women who were not given anything by mouth post caesarean section. None of the 200 women were given any kind of bowel stimulants post caesarean section. The same rehabilitation programme for ambulation was used in both the groups, except the gum chewing. Auscultation was done for intestinal sounds every 4 hours. The women were allowed to sip water 12 hours post caesarean. Oral intake of clear fluids was allowed after passage of flatus which then followed intake of soft diet. Patients were allowed regular diet allowed passage of first bowel motion. Patients were discharged on the 5th post-operative if they were vitally stable, afebrile with no morbidity for at least 48 hours, could urinate and ambulate without any assistance and had passed stool at least twice and were on a regular diet.

For pain relief, two intra-muscular doses of 75 mg diclofenac were given to all patients in the post-operative period. Also, post-operative data record included post-operative tolerance to chewing gum and post-operative complications which include fever, re-suturing, blood transfusion, hospital readmission, occurrence of mild ileus symptoms (vomiting and abdominal tension felt by patient and seen on examination) and post-operative paralytic ileus which is defined as a group of manifestations lasting longer than 24 hours or requiring insertion of nasogastric tube, non-passage of bowel sounds or flatus. These manifestations include absent or hypoactive bowel sounds, non-passage of flatus or bowel movement, abdominal distension, more than three episodes of vomiting, with or without generalized crampy abdominal pain.

In our study, most of the patients had passed flatus by 30 hours post-operatively. Therefore, the mean time for passage of flatus was assumed to be 24 hours post-operatively. The mean time interval to passage of flatus after gum chewing was proposed to be 18 hours in study group. Effect i.e., 6 hours difference in mean was selected to be smallest effect that would be important to detect.

Comparison between both groups performed using 2-tailed student t test for continuous variables and chi-square/ Fisher's exact for categorical variables. Throughout all analysis $p<0.05$ considered statistically significant.

RESULTS

The study involved 200 women who were randomly assigned into study (Group A) and control (Group B) groups. The demographic characteristic was similar in both groups (Table 1). Only previous abdominal surgery performed other than CS was found to be appendicectomy. The most common indication for caesarean section was previous caesarean section (60% in group A and 65.5% in Group B). The indication for primary caesarean section in both the groups were similar which included maternal condition (gestational hypertension/ diabetes), meconium-stained liquor, fetal distress and malpresentation.

Table 1: Demographic characteristics.

Variables	Group A, (n=90) (%)	Group B, (n=110) (%)	P value
Age (years)	26.2±4.1	26.4±4.6	0.713
Primigravida	35 (38.9)	40 (36.4)	0.593
Type of CS			
Primary	36 (40)	39 (35.5)	
Repeat	54 (60)	71 (65.5)	0.7
Prior abdominal surgery	4 (4.4)	10 (9.1)	0.051
Gestational age (weeks)	38.8±1	38.8±0.9	0.978

Values mentioned as mean ± SD, range or numbers, percentage.

All the caesarean sections were performed under spinal anaesthesia via low transverse skin incision (Pfannenstiel incision). The intra-operative and post-operative characteristics are shown in Table 2. Severe adhesions were seen in 12 operations only and adhesiolysis was not difficult and did not involve bowel injury or bowel dissection. Blood loss was above average in 6 patients only. In the study group, the duration of surgery was longer. All gum chewing patients tolerated and completed their gum chewing course until bowel function. There were no adverse events noted due to gum chewing. Post-operative ileus was noted only in one patient in control group and was relieved by conservative management.

Table 2: Intra-operative and post-operative characteristics.

Variables	Group A, (n=90) (%)	Group B, (n=110) (%)	P value
Severe adhesions	4 (4.44)	8 (7.27)	0.288
Extension of uterine incision	1 (1.11)	1 (1.11)	0.921
Blood transfusion	4 (4.44)	2 (1.81)	0.128
Duration of surgery (min)	45±7.5*	40±8.2	<0.05
Febrile morbidity	6 (6.67)	8 (7.27)	0.646
Abdominal distension	3 (3.33%)*	15 (13.63%)	<0.001
Postoperative vomiting	1 (1.11)	2 (1.81)	0.384
Postoperative ileus	0	1 (0.90)	0.35

*Significantly different from control as p<0.05.

Table 3: Primary outcome measures in study and control groups.

Variables	Group A, (n=90)	Group B, (n=110)	Difference between means, (95% CI)	P value
Post-op intestinal sounds heard (hours)	10.8±2.8	15.6±3.7	4-5.7	<0.001
Post-op passage of flatus (hours)	18.9±4.8	24.4±7.4	4.7-8	<0.001
Post-op passage of motion (hours)	22.4±4.7	32±8.3	7-10.8	<0.001
Post-op hospital stays (hours)	72±10.6	83±9.1	7-11.5	<0.001

Values are mentioned as mean ± SD, or range.

The time to return of gastro-intestinal function was significantly shorter in the study group compared to the control group (Table 3). The passage of first bowel motion occurred within 24 hours in 85 (94%) subjects in study group compared to 50 (45%) subjects in control group. The post-operative stay was significantly longer in the control group as compared to the study group.

DISCUSSION

The present study shows a further improvement in post-operative management of patients who have had a caesarean section. Our study shows a beneficial effect of gum chewing in terms of shorter mean time interval to return of intestinal sound (10.8 versus 15.6 hours), passage of flatus (18.9 versus 24.4 hours), passage of motion (22.4 versus 32 hours) and post-op hospital stay (72 versus 83 hours). The time-intervals noted for passage of flatus and defecation are comparatively shorter than those noted reported with gum feeding or early enteral feeding after caesarean section in previous studies.

In a study which included 32 women, post-operative gum chewing was associated with early passage of flatus by 15.5 hours compared with the control group (28.4 versus 43.9 hours respectively).[14] With early enteral feeding, the mean time interval to return of normal bowel sounds were reported to be 10.3 versus 14.5 hours, 24.2 versus 34.2 hours and 25.5 versus 28.7 hours.[15-17] The mean time interval to passage of flatus were reported to be reported to be 32.3 versus 42.4 hours, 45.3 versus 47.3 hours and 51.6 versus 62.1 hours.[16-18] The time interval to first motion in the study and control groups were reported to be 30 versus 43.3 hours, 34.5 versus 51 hours and 67.8 versus 75.8 hours.[16.19,20]

The increased frequency of gum chewing in the present study (every 2 hours) might explain the earlier recovery of bowel activity compared with less frequent gum chewing (three times in a day) in previous study.[14]

As noticed in a previous study, most of the women who chewed gum were generally pleased, felt more comfort and reported less dryness of the mouth.[13] Although early consumption of solid food in women is also reported to be well tolerated, with no significantly increased gastrointestinal complications, it might be associated with decreased tolerance to the first postoperative diet.[18-20] As with early enteral feeding, we found no difference in mild ileus symptoms, yet abdominal distension was less in the gum chewing group. Although severe ileus is rare after caesarean section, it was found by us in traditional management of one patient only.[20]

Early discharge of selected cases after caesarean section was suggested as a safe, feasible and cost-effective option. Major determinants of early discharge include post-operative nausea and return of normal bowel function. Our study shows a beneficial effect of chewing after CS in terms of earlier discharge from the hospital (72 hours) compared to those reported after early enteral feeding ranging upto 5.5 days.[16,18,20]

The findings of the present study, involving 200 subjects, concur with 2 recent meta-analyses of 5 randomised trials, entailing 158 patients undergoing bowel surgery.[21, 22]

CONCLUSION

In conclusion, our study shows that gum chewing enhances early return of bowel activity in post-caesarean section patient as it stimulates bowel motility and it is a

safe, well tolerated, inexpensive and acceptable method. Moreover, it has an economic impact as it lets the patients to be discharged from the hospital on a earlier basis which is important in a developing country with limited resources.

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