

Chewing Gum after Caesarean Section: Effect on Bowel Function Recovery

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Abstract: Increased caesarean - associated morbidities and postoperative complications, such as postoperative ileus, which affects up to 20% of post - caesarean cases, are observed in India. Chewing gum appears to be a solution to expedite bowel function in patients following caesarean sections. To assess the effects of gum chewing on post - caesarean women, 150 patients were equally divided and randomly assigned into a gum - chewing group and a control group. The control group was given the usual post - operative directions, whereas the chewing group was instructed to chew sugar - free gum post - operatively. Bowel function recovery was evaluated with an oral questionnaire which enquired about the time taken for the first feeling of hunger, and the first passage of flatus and stool. The study revealed that the gum chewing group had a significantly earlier recovery of bowel function and also a notably shorter hospital stay. The mean time for the first feeling of hunger was 7.43 hours earlier in the gum chewing group. The mean time for passage of flatus and stool was 9.55 and 5.28 hours earlier, respectively, in the gum chewing group. The patients in the gum - chewing group were discharged at a mean of 0.92 days (22.08 hours) earlier than the standard care group. Gum chewing, a safe, practical, and inexpensive practice, can be a vital strategy to prevent such a common postoperative complication like post - operative ileus apart from contributing to their dental care.

Keywords: post-caesarean recovery, gum chewing benefits, bowel function recovery, postoperative ileus prevention, shorter hospital stay

1. Introduction

The rate of caesarean section in India has been steadily rising in the last few decades. ¹ As per the latest data (NFHS - 5), the caesarean rate in India is around 21.5%, a significant jump from 17.2%, as reported in NFHS - 4 (2015 - 16). The NFHS - 5 (2019 - 21) data also reveals that Assam's caesarean rate is 18.1%. ² With this rise comes an increased burden of caesarean - associated morbidities and postoperative complications. One such commonly faced complication is postoperative ileus, which affects up to 20% of post - caesarean cases. ³

Post - operative ileus is a prolonged absence of bowel function after surgery, which can lead to abdominal distension, vomiting, post - operative pain/discomfort and prolongation of hospital stay, thus resulting in significant morbidity. ⁴ Though its aetiology and pathophysiology are unclear, it is one of the most common complications in abdominal surgeries, including caesarean sections. Stimulation of pain fibres, excessive sympathetic tone, and the release of inhibitory neurotransmitters from the intestinal wall linked to peritoneal irritation and bowel manipulation have all been proposed as the underlying processes. ³

Various measures have been recommended to hasten bowel recovery after caesarean delivery, such as early ambulation, early hydration, rectal stimulation and early oral feeding. ⁵ With early oral feeding, there is always a risk of vomiting, which may lead to aspiration pneumonia, wound dehiscence and anastomotic leakage. Gum chewing is a form of "sham feeding" which stimulates the cephalic vagal pathway, causing humoral and neural stimulation of gut motility. ⁶ Sham feeding has been suggested as a safe method to stimulate early recovery of bowel function without the complications that may be associated with real feeding. It has been demonstrated to accelerate the resumption of gastrointestinal motility in colorectal surgeries. ⁶

Although a wealth of evidence supports the use of postoperative gum chewing during colorectal surgery, there is not much evidence on its role in post - caesarean section patients. It would not be suitable to directly apply colorectal patient data to women undergoing caesarean sections as both these procedures are vastly different. This study aims to assess the effect of gum chewing on the recovery of bowel function in patients following caesarean section and whether it can reduce the incidence of postoperative ileus.

2. Materials and Methods

This comparative study was conducted over three months at the Department of Obstetrics & Gynaecology, Assam Medical College and Hospital, Dibrugarh. Women over the age of 18 years undergoing caesarean section under spinal/epidural anaesthesia were eligible for the study. Patients with pre - existing chronic gastrointestinal conditions (like Crohn's disease, ulcerative colitis, malabsorption syndromes, previous bowel surgeries), medical conditions (like thyroid disorders, diabetes, water/electrolyte imbalance, intellectual disabilities), eclampsia, and those suffering intraoperative complications such as bowel injury were excluded from the study. Age, parity, weight/height and details of caesarean section (nature, indication, intraoperative complications, duration) were noted. A total of 150 patients were randomly assigned into 2 groups of 75 each – the gum - chewing group (group A) and the control group (group B). The control group was given the usual post - operative directions, whereas group A was instructed to chew a sugar - free gum post - operatively. They received pellets of a standard brand of sugar - free gum to chew immediately after the surgery, thrice a day, till the passage of flatus and stool. They were asked to continuously chew the gum for half an hour without swallowing it.

In the postoperative period, bowel function recovery was evaluated using an oral questionnaire. This was done by enquiring the time taken for the first feeling of hunger, and

the first passage of flatus and stool. Other factors like abdominal distension, the need for post-operative prokinetics or antiemetics, and the duration of stay in the hospital were also noted for both groups.

3. Results and Observations

The mean age was 28 years in the gum chewing group and 27 years in the control group. 77.4% of the gum chewing group and 72% of the control group underwent an emergency caesarean section (Table 1)

Table 1: Demographic survey and details of surgery of the 150 patients.

Variables	Gum chewing group	Control group	p - value
Age (years)	28.0 ± 5.4	27.0 ± 5.4	0.4
BMI	26.3 ± 2.8	26.6 ± 3.1	0.6
Parity	0.5 ± 0.6	0.4 ± 0.6	0.7
Duration of surgery	< 90 minutes	66 (88%)	0.5
	≥ 90 minutes	9 (12%)	
Type of caesarean section	Emergency	58 (77.4%)	0.4
	Elective	17 (22.6%)	
Indication of caesarean section	Previous caesarean section	15 (20%)	
	Foetal distress	38 (50.7%)	
	Cephalopelvic Disproportion	13 (17.3%)	
	Placenta praevia	7 (9.4%)	
	Others	2 (2.6%)	

Table 2: Comparison between the first feeling of hunger in patients in the two groups

Time taken for the first feeling of hunger	Gum chewing group, N (%)	Control group, N (%)	p - value
< 10 hours	37 (49.3%)	3 (4%)	<0.01
10 - 20 hours	34 (45.3%)	50 (66.7%)	
>2 0 hours	4 (5.4%)	22 (29.3%)	
Mean ± S. D.	11.88 ± 4.09	19.31 ± 3.56	

Majority (49.3%) of the gum chewing group experienced their first feeling of hunger with 10 hours of surgery while majority (66.7%) of the control group felt it between 10 to 20 hours after surgery (Table 2). The mean time taken for hunger onset was 7.43 hours earlier in the gum chewing group which is statistically significant (p - value < 0.01).

Table 3: Comparison between the time taken to pass flatus in patients in the two groups

Time taken for the first feeling of hunger	Gum chewing group, N (%)	Control group, N (%)	p - value
<10 hours	37 (49.3%)	3 (4%)	<0.01
10 - 20 hours	34 (45.3%)	50 (66.7%)	
>20 hours	4 (5.4%)	22 (29.3%)	
Mean ± S. D.	11.88 ± 4.09	19.31 ± 3.56	

Furthermore, 74.7% of the gum chewing group passed flatus within 10 to 20 hours of surgery while 74.7% of the control group took more than 20 hours for the same (Table 3). The mean time taken for first passage of flatus was 9.55 hours earlier in the gum - chewing which is statistically significant (p - value < 0.001).

Table 4: Comparison between the time taken to pass stool in patients in the two groups.

Time taken for the first passage of stool	Gum chewing group, N (%)	Control group, N (%)	p - value
<20 hours	18 (24%)	2 (2.7%)	<0.01
20 - 30 hours	32 (42.7%)	21 (28%)	
>30 hours	25 (33.3%)	52 (69.3%)	
Mean ± S. D.	28.84 ± 2.91	34.12 ± 3.06	

Similarly, 42.7% of the gum chewing group passed stool by the 10 to 20 hours mark while 69.3% of the control group

took more than 20 hours to pass stool (Table 4). The mean time taken for first passage of stool was 5.28 hours earlier in the gum - chewing which is statistically significant (p - value < 0.01).

Table 5: Comparison between the duration of hospital stay in patients in the two groups.

Duration of hospital stay	Gum chewing Group, N (%)	Control Group, N (%)	p - value
≤3 days	18 (24%)	2 (2.7%)	<0.01
4 - 7 days	56 (74.7%)	68 (90.6%)	
≥7 days	1 (1.3%)	5 (6.7%)	
Mean ± S. D.	3.99 ± 0.77	4.91 ± 0.88	

Patients in the gum chewing group had a shorter hospital stay (3.9 days) compared to those in the control group (4.9 days), which is statistically significant (p - value < 0.01) (Table 5).

None of the women in the chewing gum group reported any side effects. All the patients were complaint to the instructions given to them and were counselled well before being given the gum pellet. They were also under the direct supervision of the resident doctors and ward nurses. None of the patients in the gum chewing had nausea, vomiting or abdominal distension requiring antiemetics, nor did they have any postoperative complications until they were discharged. 3 women in the control group had nausea and abdominal distension that required administration of prokinetics and enemas.

4. Discussion

After a caesarean section, like any major open abdominal surgery, transient paralytic ileus may occur. The underlying mechanisms have been suggested to involve stimulation of pain fibres, excessive sympathetic tone, and release of inhibitory neurotransmitters from the intestinal wall due to peritoneal irritation and bowel manipulation. ⁴

This prolonged absence of bowel function can lead to abdominal distension, vomiting, and postoperative

pain/discomfort, resulting in added morbidity. Early oral feeding following surgery has raised concerns since it might cause vomiting, which can then result in aspiration pneumonia, anastomotic leakage, and wound dehiscence. Because of this, many physicians have historically delayed postoperative oral intake until the ileus resolves, made evident by the passing of flatus and bowel sounds, even without clear scientific data to support this practice.⁵ "Sham feeding" is a safe way to encourage bowel function recovery without the potential problems of ingesting actual food.⁶

This study used a standard Indian brand of sugar - free chewing gum containing xylitol. Lee *et al.* demonstrated that the xylitol ingredient in sugar - free gum is associated with earlier recovery of bowel function and, therefore, may be superior to non - xylitol gums.⁷ Studies have shown that xylitol can influence the composition and activity of gut microbes in *in vitro* and animal models. However, the evidence of its effects on human gut health is still sparse.⁸ Our study participants were instructed to chew the gum immediately after surgery. However, in previous studies, the time of starting the chewing ranged from the immediate postpartum period to up to 12 hours after surgery.^{7, 9, 10}

A few randomised control trials have been conducted to test the efficacy of gum chewing after caesarean sections for bowel recovery, which has yielded conflicting results. In 2017, Ciardulli *et al.*¹¹ conducted a systematic review and meta - analysis of 17 trials, including 3041 women, to determine the efficacy of chewing gum in improving postoperative recovery of gastrointestinal function after caesarean delivery. They recommend chewing gum three times a day, immediately following caesarean delivery, for around 30 minutes till the first flatus for early recovery of intestinal motility. Hua - Ping's 2015 meta - analysis¹² of 5 randomised control trials revealed no advantages to postoperative gum chewing following a caesarean section. Hochner's meta - analysis¹³ in the same year, which included 846 participants, showed that gum - chewing had a beneficial impact on intestinal motility. Thus, there are a lot of conflicting data in this regard.

The present study carried out on 150 patients from the north - eastern states of India could be compared with the studies performed on patients from the southern states by Gayathri R. *et al.* in Pondicherry in 2020.¹⁰ They found the mean time for passage of flatus and stool to be 6 and 5 hours earlier, respectively, whereas it was 9.55 and 5.28 hours earlier, respectively, in our study. 20% of the patients in the Pondicherry study were not compliant to gum chewing. All our study participants chewed the gum pellet as instructed as they were under direct supervision and were counselled properly. Nonetheless, both studies have found gum chewing to be a safe approach to hasten bowel function recovery.

5. Conclusion

Gum chewing, being a safe, practical, and inexpensive practice can prove to be a vital strategy to prevent such a common postoperative complication. It can significantly improve bowel recovery in patients who have undergone caesarean section. Patients need to be counselled and

observed to ensure that they are compliant.

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