

ROLE OF GUM CHEWING IN POST-OPERATIVE GUT MOTILITY AFTER CESAREAN SECTION

Original Research

Maryam Aslam^{1*}, Erum Parvaiz¹, Abida Bilal¹, Anam Mahreen¹

¹CMH Gujranwala, Pakistan.

Corresponding Author: Maryam Aslam, CMH Gujranwala, Pakistan, maryamchaudhary29.mc@gmail.com

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ABSTRACT

Background: Postoperative ileus is a common complication following cesarean section, resulting in delayed bowel motility, abdominal discomfort, and prolonged hospital stay. Various non-pharmacological strategies have been explored to enhance gastrointestinal recovery, among which gum chewing is gaining recognition. Acting as a form of sham feeding, gum chewing stimulates the cephalic-vagal pathway, which in turn promotes intestinal motility. However, there is limited local evidence to support its implementation in post-cesarean care.

Objective: To compare the outcomes of gum chewing versus control in promoting postoperative gut motility after cesarean section.

Methods: This randomized controlled trial was conducted over six months (May to October 2024) in the Department of Obstetrics and Gynecology at CMH Gujranwala. A total of 60 pregnant females undergoing cesarean delivery under spinal anesthesia were enrolled and randomized equally into two groups. Group A received sugar-free chewing gum 6 hours postoperatively, three times daily until the passage of first flatus. Group B received routine postoperative care. Clinical parameters recorded included time to first feeling of hunger, time to first flatus, time to first fecal passage, and duration of hospital stay. Data were entered and analyzed using SPSS version 25, and independent sample t-tests were applied. A p-value ≤ 0.05 was considered statistically significant.

Results: The mean time to first hunger sensation was 11.13 ± 1.87 hours in the chewing gum group and 15.33 ± 2.11 hours in the control group ($p < 0.001$). Time to first flatus was 12.37 ± 2.54 hours vs. 17.93 ± 1.64 hours ($p < 0.001$), while time to first fecal passage was 21.13 ± 2.27 hours vs. 27.67 ± 5.19 hours ($p < 0.001$), respectively. Mean hospital stay was significantly shorter in the chewing gum group (2.67 ± 0.61 days) compared to control (4.17 ± 1.12 days; $p < 0.001$).

Conclusion: Chewing gum significantly enhances postoperative gastrointestinal motility and facilitates earlier discharge following cesarean section.

Keywords: Cesarean Section, Chewing Gum, Flatus, Gastrointestinal Motility, Hunger, Postoperative Care, Recovery of Function.

INTRODUCTION

The Cesarean section (C-section) has become an increasingly common mode of childbirth, with its prevalence ranging from 15% to over 50% in various parts of the world (1,2). While often necessary for maternal or fetal indications, the procedure is not without postoperative complications. One such concern is the temporary cessation of bowel function, commonly referred to as postoperative ileus, which occurs as a physiological response to abdominal surgery. Following a cesarean delivery, the colon typically takes 48 to 72 hours to resume normal function, while the stomach and small intestine recover within 24 to 48 hours and a few hours, respectively (3-5). This delay in gastrointestinal (GI) motility may lead to symptoms such as abdominal distension, cramping, nausea, vomiting, and discomfort due to the accumulation of gas and intestinal secretions. In many cases, these symptoms hinder oral intake, delay wound healing, and prolong hospital stay, negatively impacting maternal recovery and increasing healthcare costs (6). The use of opioid analgesics during and after surgery has been shown to further exacerbate delays in bowel function due to their inhibitory effects on GI motility (7). As healthcare providers seek safe and cost-effective strategies to expedite recovery, attention has turned to non-pharmacological interventions. One such intervention is gum chewing, which has been explored in various abdominal surgeries for its potential to stimulate the digestive tract through a process termed “sham feeding.” By mimicking the act of eating, gum chewing triggers cephalic-vagal stimulation, leading to increased secretion of digestive enzymes and early activation of gastrointestinal motility (7,8). Clinical studies and meta-analyses have indicated that women who chew sugar-free gum for 30 to 60 minutes, at least three times daily following cesarean section, may experience a shorter time to first flatus, first bowel sound, first bowel movement, and reduced incidence of postoperative ileus (9). Despite its promising benefits, gum chewing has not been universally adopted into clinical practice guidelines, largely due to limited high-quality evidence and variations in outcomes reported across studies (10).

Furthermore, most existing studies have been conducted in populations outside the local context, and there is a noticeable lack of indigenous data to guide evidence-based practices in this setting. Given the safety, affordability, and ease of implementation associated with gum chewing, there is a compelling need to evaluate its efficacy in improving postoperative bowel function among women undergoing cesarean section in the local population. Therefore, this study was designed to assess the impact of gum chewing compared to standard care on gastrointestinal motility after cesarean delivery, with the objective of generating local evidence that could potentially support its routine use as a postoperative intervention.

METHODS

This randomized controlled trial was conducted in the Department of Obstetrics and Gynecology at CMH Gujranwala over a six-month period, from May 2024 to October 2024, following approval from the institutional ethical review board (Approval ID: ERB-29-2024, dated May 1, 2024). The trial was also registered on ClinicalTrials.gov (Registration ID: NCT06952985; Unique Protocol ID: 275), ensuring compliance with international clinical trial registration standards. Sample size was calculated using OpenEpi software, based on prior estimates of mean hospital stay following cesarean section— 3.23 ± 0.6 days with gum chewing versus 4.18 ± 1.28 days without it—using a 95% confidence level and 80% power. This yielded a required sample size of 60 participants, with 30 individuals in each study group (11). Women aged 18 to 40 years with parity less than five, presenting at term (≥ 37 weeks gestation), and undergoing lower segment cesarean section under spinal anesthesia were considered eligible for inclusion. Exclusion criteria comprised known history of chronic constipation, obstructed labor, hypothyroidism, intraoperative complications such as bowel injury, prior gastrointestinal surgeries, water or electrolyte imbalances, and abnormal placental conditions (e.g., placenta accreta, increta, previa, or abruption). Participants who met the eligibility criteria were recruited consecutively using a non-probability sampling technique from the operation theatre after obtaining informed written consent.

Baseline demographic and clinical information—including name, age, parity, gestational age, body mass index (BMI), history of diabetes, hypertension, anemia, and indication and type of cesarean (elective or emergency)—was recorded in a predesigned proforma. Duration of surgery was also noted from the operative record. Participants were then randomly allocated to one of two groups using the lottery method to ensure unbiased distribution. Women in Group A (intervention group) were advised to begin chewing sugar-free gum six hours postoperatively, three times daily, and to continue until the passage of first flatus. Group B (control group) received standard

postoperative care, which involved resumption of oral intake only after the return of bowel sounds. Participants in both groups were monitored in the postnatal ward for key indicators of gastrointestinal recovery, including time to first sensation of hunger, time to first passage of flatus, time to first bowel movement, and overall hospital stay. Women were discharged once they were tolerating oral intake, experiencing minimal pain, and managed with oral analgesics. All observations were carefully documented using structured data collection tools. Statistical analysis was performed using SPSS version 25. Quantitative outcomes—such as time to first hunger, flatus, defecation, and total duration of hospitalization—were compared between the two groups using the independent samples t-test. A p-value of ≤ 0.05 was considered statistically significant to determine the effect of gum chewing on postoperative bowel motility.

RESULTS

A total of 60 women who underwent cesarean section were enrolled and randomized equally into two groups. The mean age of participants in the chewing gum group was 26.23 ± 6.38 years, while in the control group it was 27.07 ± 7.45 years. The mean gestational age at delivery was 38.63 ± 1.27 weeks in the chewing gum group and 38.77 ± 1.36 weeks in the control group. Participants in the chewing gum group had a mean BMI of 26.80 ± 3.85 kg/m², compared to 28.47 ± 4.19 kg/m² in the control group. Regarding parity, the chewing gum group included 15 (50%) primigravida, 6 (20%) primiparous, and 9 (30%) multiparous women. The control group included 13 (43.3%) primigravida, 4 (13.3%) primiparous, and 13 (43.3%) multiparous women. A history of diabetes was reported in 13 (43.3%) participants in the chewing gum group and 9 (30%) in the control group. Hypertension was present in 11 (36.7%) participants in the chewing gum group and 9 (30%) in the control group. Anemia was reported in 10 (33.3%) women in the chewing gum group and 13 (43.3%) in the control group. The distribution of emergency and elective cesarean sections was identical in both groups, with 16 (53.3%) undergoing emergency and 14 (46.7%) undergoing elective cesarean delivery. The mean duration of surgery was 38.87 ± 4.29 minutes in the chewing gum group and 37.03 ± 4.36 minutes in the control group. Postoperative outcomes demonstrated statistically significant improvements in gastrointestinal recovery among women who chewed gum. The mean time to first feeling of hunger was 11.13 ± 1.87 hours in the chewing gum group compared to 15.33 ± 2.11 hours in the control group ($p < 0.001$). Similarly, the mean time to first passage of flatus was 12.37 ± 2.54 hours in the chewing gum group, significantly earlier than 17.93 ± 1.64 hours observed in the control group ($p < 0.001$). First defecation occurred at 21.13 ± 2.27 hours postoperatively in the chewing gum group, whereas in the control group it occurred at 27.67 ± 5.19 hours ($p < 0.001$). The duration of hospital stay was also significantly reduced in the chewing gum group, with a mean of 2.67 ± 0.61 days compared to 4.17 ± 1.12 days in the control group ($p < 0.001$).

Table 1: Age and gestational age of females enrolled in the study (n = 60)

	Group	
	Chewing gum	Control
n	60	60
Age (in years)	26.23 ± 6.38	27.07 ± 7.45
Gestational age (weeks)	38.63 ± 1.27	38.77 ± 1.36
BMI (kg/m ²)	26.80 ± 3.85	28.47 ± 4.19
Parity		
Primigravida	15 (50%)	13 (43.3%)
Primiparous	6 (20%)	4 (13.3%)
Multiparous	9 (30%)	13 (43.3%)
History of:		
Diabetes	13 (43.3%)	9 (30%)
Hypertension	11 (36.7%)	9 (30%)
Anemia	10 (33.3%)	13 (43.3%)
Type of cesarean section		
Emergency	16 (53.3%)	16 (53.3%)
Elective	14 (46.7%)	14 (46.7%)
Duration of cesarean section	38.87 ± 4.29	37.03 ± 4.36

Table 2: Comparison of both groups for outcome of trial (n = 60)

	Group		P-value
	Chewing gum	Control	
n	30	30	
Time of first feeling of hunger:	11.13 ± 1.87	15.33 ± 2.11	0.000
Time of first passage of flatus:	12.37 ± 2.54	17.93 ± 1.64	0.000
Time of first passage of feces:	21.13 ± 2.27	27.67 ± 5.19	0.000
Duration of hospital stay:	2.67 ± 0.61	4.17 ± 1.12	0.000

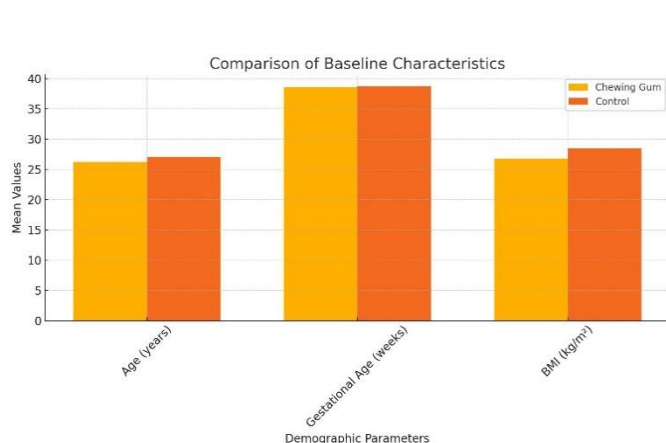


Figure 1 Comparison of Baseline Characteristics

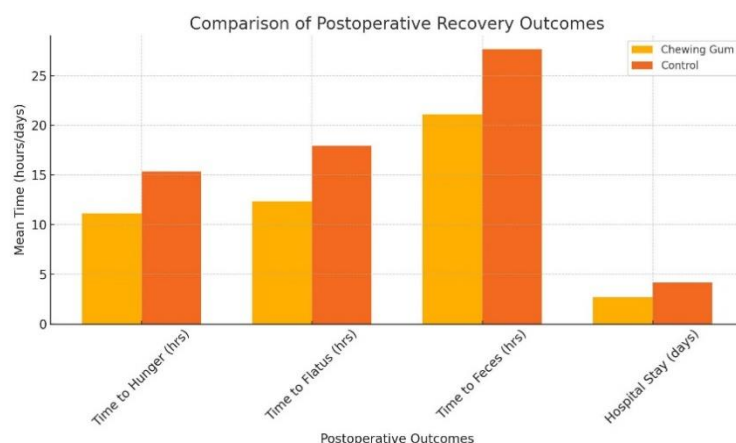


Figure 2 Comparison of Postoperative Recovery Outcomes

DISCUSSION

The present study demonstrated that postoperative chewing gum significantly improved gastrointestinal motility in women undergoing cesarean section. Participants in the chewing gum group experienced earlier onset of hunger, first passage of flatus, and first bowel movement compared to those receiving standard care. These outcomes were accompanied by a notable reduction in the length of hospital stay. The observed differences were statistically significant and aligned with findings reported in previous clinical trials and systematic reviews, reinforcing the potential value of gum chewing as a non-pharmacological intervention in postoperative recovery (12). The physiological mechanism underlying this improvement is believed to be linked to the stimulation of the cephalic-vagal pathway. Chewing gum activates neural and hormonal pathways through the process of sham feeding, leading to enhanced intestinal myoelectric activity and the release of gastrointestinal hormones such as neurotensin, gastrin, and pancreatic polypeptide (13,14). This cascade of events contributes to the earlier resumption of bowel activity and reduced gastrointestinal symptoms, such as abdominal distension and nausea, commonly seen after abdominal surgery (15). Increased duodenal alkaline secretion further supports this effect, mimicking the digestive responses triggered by actual food intake.

Several previously published trials have reported similar findings, with significantly reduced times to passage of flatus and feces in gum-chewing groups. Studies conducted in varied clinical settings have reported reductions in time to bowel activity ranging from 5 to 10 hours, highlighting the reproducibility of this intervention across populations (16-18). These findings are consistent with meta-analyses that have concluded that gum chewing enhances bowel motility, reduces discomfort, and facilitates faster discharge from hospital settings (19,20). The current study's results strengthen this body of evidence, particularly within the context of the local population, where data have been limited. The reduction in hospital stay noted in the chewing gum group is of particular clinical relevance. Earlier discharge reduces the burden on healthcare systems, lowers hospitalization costs, and minimizes the risk of nosocomial complications. While some prior studies have reported relatively modest reductions in hospital stay duration, the present study observed

a difference of more than 1.5 days between the two groups (21,22). Such findings not only reinforce the physiological benefits but also highlight the potential administrative and economic impact of routine gum-chewing protocols post-cesarean section.

Despite the promising results, several limitations must be acknowledged. The sample size, although statistically calculated, was relatively small and may not capture all variations in patient response. The use of non-probability consecutive sampling may have introduced selection bias, and while randomization was implemented through the lottery method, blinding was not feasible, which may have influenced patient-reported outcomes. Furthermore, adherence to gum-chewing frequency and duration was not objectively monitored, and outcomes such as postoperative pain scores, incidence of nausea or vomiting, and maternal satisfaction were not assessed—factors that could provide a more comprehensive view of recovery. The study's strength lies in its randomized design, clearly defined outcomes, and uniform perioperative management protocols. Moreover, it adds valuable local evidence supporting the integration of gum chewing into post-cesarean recovery protocols, particularly in resource-constrained settings where low-cost interventions can have a high yield.

Future research should focus on larger multicenter trials with blinded assessment of outcomes and objective monitoring of compliance. Inclusion of additional endpoints such as patient comfort, gastrointestinal symptom scores, cost analysis, and safety profile will further refine the clinical utility of this intervention. Longitudinal follow-up to assess any delayed adverse effects or recurrence of gastrointestinal symptoms may also be beneficial. In conclusion, the findings of this study support the use of postoperative chewing gum as an effective, safe, and low-cost strategy to accelerate bowel recovery and reduce hospital stay after cesarean section. These results provide a foundation for future large-scale investigations and potential updates to clinical practice guidelines in postoperative obstetric care.

CONCLUSION

This study concluded that chewing gum is an effective and safe strategy to enhance gastrointestinal motility following cesarean section, contributing to quicker recovery, earlier return of bowel function, and timely hospital discharge. By generating local evidence, the trial reinforces the clinical value of this low-cost, non-pharmacological intervention in postoperative care. These findings support the inclusion of chewing gum in post-cesarean recovery protocols, with the potential to improve maternal outcomes and reduce healthcare burden. Based on the observed benefits, routine recommendation of gum chewing after cesarean delivery may be considered in future clinical practice.

AUTHOR CONTRIBUTION

Author	Contribution
Maryam Aslam*	Substantial Contribution to study design, analysis, acquisition of Data
	Manuscript Writing
	Has given Final Approval of the version to be published
Erum Parvaiz	Substantial Contribution to study design, acquisition and interpretation of Data
	Critical Review and Manuscript Writing
	Has given Final Approval of the version to be published
Abida Bilal	Substantial Contribution to acquisition and interpretation of Data
	Has given Final Approval of the version to be published
Anam Mahreen	Contributed to Data Collection and Analysis
	Has given Final Approval of the version to be published

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