The Research of Medical Science Review
ISSN: 3007-1208 & 3007-1216 Volume 3, Issue 3, 2025

ROLE OF GUM CHEWING IN POSTOPERATIVE GUT MOTILITY AFTER CESAREAN SECTION UNDER GENERAL ANESTHESIA

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DOI: https://doi.org/10.5281/zenodo.18309606

Keywords
gum chewing, gut motility, cesarean section, postoperative recovery, general anesthesia.

Article History
Received: 30 Dec 2024
Accepted: 18 Jan 2025
Published: 31 March 2025

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Abstract

Objective: *to evaluate the role of gum chewing in improving postoperative gut motility among women undergoing cesarean section under general anesthesia, and to determine whether early gum chewing can help in faster return of bowel sounds and reduce postoperative discomfort and ileus.*

Place and Duration: *Department of Gynaecology and Obstetrics, Tertiary Care Hospital, data collection from Jan 2024 to Nov 2024.*

Study Design: *Quasi-experimental study*

Methodology: *A total of 150 women undergoing cesarean section under general anesthesia were included through consecutive sampling. Participants were randomly divided into two groups. Group A received standard postoperative care, while Group B were asked to chew sugar-free gum for 15 minutes, three times daily, starting two hours after surgery until the first passage of flatus. The time to first bowel sound, passage of flatus, and tolerance to oral intake were recorded.*

Results: *The two groups were similar at baseline, but women who chewed gum showed a significantly faster return of gut motility, with the first bowel sound occurring at 7.92 ± 1.49 hours in Group B compared with 10.01 ± 2.05 hours in Group A ($p < 0.001$). The mean time to first passage of flatus was also shorter in the gum-chewing group at 14.01 ± 1.89 hours versus 17.83 ± 2.99 hours in the routine-care group ($p < 0.001$). Women in Group B tolerated oral intake earlier, at 17.96 ± 1.94 hours compared with 21.93 ± 3.04 hours in Group A ($p < 0.001$), and had lower postoperative abdominal discomfort scores (4.03 ± 0.91 vs 6.04 ± 1.50, $p < 0.001$). Although postoperative ileus and nausea were not significantly different between the groups, abdominal distension was significantly less common among women who chewed gum (12.0% vs 28.0%, $p = 0.014$).*

Conclusion: *The study concluded that gum chewing is a simple, safe, and cost-effective method to stimulate bowel activity and improved recovery after caesarean section under general anaesthesia.*

INTRODUCTION

Caesarean section is one of the most commonly performed surgical procedures worldwide, and its rate continues to rise every year. According to the World Health Organization, the global caesarean section rate has increased from around 12 percent in 1990 to more than 21 percent in recent years, with some regions reporting rates as high as 40 to 50 percent.[1,2] In Pakistan, the rate of caesarean deliveries has also increased steadily. National surveys show that caesarean births have risen from

about 14 percent in 2012 to more than 22 percent in recent years, especially in urban and tertiary care hospitals. With this growing number of caesarean deliveries, attention to postoperative recovery has become even more important to ensure patient comfort, early mobility, and reduced hospital stay.[3]

One of the common problems after caesarean section, especially under general anaesthesia, is delayed return of gut motility. General anaesthesia, surgical manipulation of the intestines, pain medications, and reduced early mobility can slow down bowel function.[4,5] As a result, many women experience abdominal discomfort, bloating, nausea, and delayed passage of flatus. This temporary slowing of gut activity, known as postoperative ileus, can prolong the recovery period, delay oral intake, and increase emotional and physical discomfort. In some cases, it may even require additional medical treatment, increasing the burden on both patients and healthcare systems.[6]

To improve postoperative gut motility, different non-pharmacological methods have been explored. One of the simplest and most cost-effective methods is gum chewing. Gum chewing is believed to stimulate the digestive system through a mechanism known as "sham feeding." When a person chews gum, the body senses chewing as the start of eating and activates digestive reflexes.[7] This increases saliva production, stimulates the vagus nerve, and triggers movement of the gastrointestinal tract. International studies have reported that gum chewing after abdominal surgeries can reduce the time to first bowel sound, shorten time to passage of flatus, and support early tolerance to oral intake. Several meta-analyses have shown positive effects of postoperative gum chewing across various surgical procedures, including colorectal surgery, gynaecological surgery, and caesarean section.[8,9,10]

In Pakistan, limited local research has been conducted on the effectiveness of gum chewing after caesarean deliveries, especially under general anaesthesia. Most women undergoing caesarean section are young, and faster recovery is important for early breastfeeding, new-born care, and overall well-being. A simple and inexpensive intervention such as gum chewing could offer meaningful benefits in resource-limited healthcare settings. Therefore, this study aims to evaluate the role of gum chewing in improving postoperative gut motility in women undergoing caesarean section under general anaesthesia and to provide evidence that may support its routine use in postoperative care.

Methodology:

This study was conducted as a quasi-experimental study to assess the role of gum chewing in improving postoperative gut motility among women who underwent caesarean section under general anaesthesia. The study was carried out over a defined period at the Department of Gynaecology and Obstetrics, Tertiary Care Hospital, where all data collection took place. Ethical approval for the study was obtained from the Institutional Ethics Review Committee before the start of participant recruitment, and the study was conducted in accordance with ethical standards for research involving human participants.

A consecutive sampling technique was used to select eligible participants from among women presenting for elective or emergency caesarean section under general anaesthesia.

Inclusion Criteria:

Women aged between specific reproductive age ranges, undergoing caesarean delivery under general anaesthesia, who were hemodynamically stable after surgery, and able to understand and follow instructions related to gum chewing, were included.

Exclusion Criteria:

Women with known gastrointestinal disease, bowel obstruction, paralytic ileus before surgery, metabolic disorders affecting gut motility, diabetes requiring insulin, severe anaemia, postoperative complications that required surgical intervention, or those who were unable or unwilling to chew gum were excluded from the study.

Written informed consent was obtained from all participants after explaining the purpose of the

research, expected benefits, and the voluntary nature of participation. Privacy and confidentiality of all patient information were ensured throughout the research process. Sample size was calculated using WHO sample size calculator taking confidence interval 95%, margin of error 5%, The mean time to first bowel sounds was 18.06 ± 5.11 hours in the experimental group compared to 24.42 ± 8.33 hours in the control group .[4] The estimated sample size came out to be 38 patients. (19 each group).

The recruitment process involved screening all women undergoing caesarean section during the study period, assessing them against the inclusion and exclusion criteria, and inviting those who met the criteria to participate. Once consent was obtained, each participant was assigned to one of two groups using simple random allocation. Women in Group A received routine postoperative care according to hospital protocol. Women in Group B received the same standard postoperative care but were additionally instructed to chew sugar-free gum for fifteen minutes, three times daily, starting two hours after surgery and continuing until the passage of first flatus.

Data collection was carried out using a structured proforma designed specifically for this study. The proforma included demographic information such as age, parity, indication for caesarean section, and duration of surgery. It also captured clinical details related to postoperative recovery. The key operational definitions applied in the study included return of bowel sounds, which was defined as the first audible bowel sound heard on auscultation; passage of flatus, which was considered the first self-reported release of gas; and tolerance of oral intake, which referred to the ability to take and tolerate clear fluids without nausea or vomiting. Postoperative ileus was described as delay in the return of gut motility beyond the expected time frame, accompanied by abdominal discomfort, distension, or nausea.

Study parameters included the time taken for the first bowel sound, the time to first passage of flatus, and the time when the participant tolerated oral intake. These variables were recorded by trained nursing staff who were briefed about the study requirements to ensure consistency in measurements. The intervention of gum chewing was monitored to ensure adherence, and participants were reminded to follow the chewing schedule. Any postoperative complications or deviations from the protocol were recorded for analysis.

The completed profomas were reviewed for accuracy, and the collected data were entered into a statistical software package for analysis. Descriptive statistics such as mean and standard deviation were calculated for numerical variables, while frequencies and percentages were calculated for categorical variables. The comparison between the two groups was made using appropriate statistical tests such as the independent samples t-test for continuous variables and the chi-square test for categorical variables. The p-value of less than 0.05 was considered statistically significant. Results were presented in tables and narrative form to show the effect of gum chewing on postoperative gut motility.

Results:

A total of 150 females undergoing cesarean section under general anesthesia were included in the study, with 75 individuals in each group. Group A received routine postoperative care, while Group B was instructed to chew sugar-free gum for 15 minutes three times a day starting two hours after surgery. The mean age of Group A patients was 27.54 ± 3.83 years and Group B 27.80 ± 3.73 years, and the difference was not statistically significant (p = 0.676). Parity was also similar between the groups, with no significant difference observed (p = 0.564).The mean gestational age at the time of cesarean section was not statistically significant between Group A (38.14 ± 1.09 weeks) and Group B (38.17 ± 0.94 weeks), i.e p value 0.879. The distribution of elective and emergency cesarean sections was almost same in both groups. In Group A, 38 (50.7%) cases were elective and 37 (49.3%) were emergency, while in Group B, 36 (48.0%) were elective and 39 (52.0%) were emergency. This difference was not statistically significant (p = 0.781).However, Group A had a mean surgical duration of 46.08 ± 8.19 minutes compared to 43.26 ± 8.10 minutes in Group B, and this

difference was significant (p = 0.035). The baseline characteristics of both groups shown in Table-I. The mean time to the first bowel sound was smaller in Group B (7.92 ± 1.49 hours) as compared to Group A (10.01 ± 2.05 hours), with highly statistically significant p value < 0.001. Similarly, the time to first passage of flatus was reduced in Group B (14.01 ± 1.89 hours) as compare to Group A (17.83 ± 2.99 hours) with significant p value < 0.001.Moreover, females in Group B tolerated oral intake at an average of 17.96 ± 1.94 hours compared to 21.93 ± 3.04 hours in Group A, showing a statistically significant improvement (p < 0.001). Furthermore, postoperative abdominal discomfort scores were lower in Group B (4.03 ± 0.91) than in Group A (6.04 ± 1.50), significant reduction in discomfort among participants who chewed gum (p < 0.001) shown in Table-II. The frequency of postoperative ileus was slightly higher in Group B (12.0%) compared to Group A (9.3%), but this difference was not statistically significant (p = 0.792). Similarly, nausea and vomiting occurred in 26.7% of participants in Group A and 18.7% in Group B, but the difference was not statistical significance (p = 0.330. However, abdominal distension was significantly more common in Group A, where 28.0% of women reported this complication, compared to only 12.0% in Group B. This difference was statistically significant (p = 0.014) shown in Table-III.

Table-I: Baseline Characteristics of Study Participants (n=150)

Variables	Group A (n=75)	Group B (n=75)	p value
Mean Age (Years)	27.54±3.83	27.80±3.73	0.676
Parity	2.00 (3.00 – 1.00)	1.00 (3.00 – 1.75)	0.564
Gestational Age	38.14±1.09	38.17±0.94	0.879
Indication for Cesarean Section • Elective • Emergency	 38 (50.7%) 37 (49.3%)	 36 (48.0%) 39 (52.0%)	0.781
Duration of Surgery (minutes)	46.08±8.19	43.26±8.10	0.035

Table-II: Comparison of Postoperative Gut Motility Outcomes among the study Groups (n=150)

Variables	Group A (n=75)	Group B (n=75)	p value
Time to First Bowel Sound (Hours)	10.01±2.05	7.92±1.49	< 0.001
Time to First Passage Flatus (Hours)	17.83±2.99	14.01±1.89	< 0.001
Time to Tolerance of Oral Intake (hours)	21.93±3.04	17.96±1.94	< 0.001
Postoperative Abdominal Discomfort Score	6.04±1.50	4.03±0.91	< 0.001

Table-III: Postoperative Complications of Study Groups (n=175)

Variables	Group A (n=75)	Group B (n=75)	p value
Postoperative ileus	07 (9.3%)	9 (12.0%)	0.792
Nausea/Vomiting	20 (26.7%)	14 (18.7%)	0.330
Abdominal Distension	21 (28.0%)	9 (12.0%)	0.014

Discussion:

The main findings of this study showed that gum chewing significantly improved postoperative gut motility in women who underwent caesarean section under general anaesthesia. Women in the gum-chewing group had an earlier return of bowel sounds, with a mean time of 7.92 ± 1.49 hours compared with 10.01 ± 2.05 hours in the routine-

care group, and this difference was highly significant ($p < 0.001$). The time to first passage of flatus was also markedly reduced in the intervention group at 14.01 ± 1.89 hours, whereas women in the control group passed flatus at 17.83 ± 2.99 hours ($p < 0.001$). In addition, tolerance to oral intake occurred earlier in the gum-chewing group, with the mean time recorded as 17.96 ± 1.94 hours compared with 21.93 ± 3.04 hours among women who received routine care ($p < 0.001$). Women who chewed gum also reported lower postoperative abdominal discomfort scores (4.03 ± 0.91) compared with the control group (6.04 ± 1.50), demonstrating a significant reduction in discomfort ($p < 0.001$). Although the rate of postoperative ileus and nausea did not differ significantly between the groups, abdominal distension was significantly less frequent in the gum-chewing group at 12.0 percent compared with 28.0 percent in the routine-care group ($p = 0.014$). These results clearly indicate that gum chewing played a meaningful role in supporting faster gastrointestinal recovery after caesarean section under general anaesthesia.

These findings are consistent with several international studies demonstrating the beneficial effect of gum chewing on postoperative gastrointestinal function. A meta-analysis by O'Connell et al.[11] reported that gum chewing reduced the time to first bowel sound by nearly 2.8 hours and shortened the time to passage of flatus by approximately 4.2 hours following caesarean section, which aligns closely with the 2.09-hour and 3.82-hour reductions observed in the present study. Similarly, a randomized controlled trial by Abasi et al.[12] found that women who chewed gum after caesarean delivery passed flatus around 14.5 hours postoperatively compared with 20.2 hours in the routine-care group, which closely matches the mean times observed in the current findings. The marked improvement in oral intake tolerance found in this study also supports previous evidence from Yenigul et al.,[13] who showed that postoperative gum chewing stimulated early gastrointestinal activity by promoting vagal stimulation and increasing bowel movement. Furthermore, the significant reduction in abdominal discomfort and distension recorded in this study resembles the findings of Elkan Kiyat et al.,[14] who reported that gum chewing reduced postoperative bloating and enhanced patient comfort after gynaecological surgery.

In the South Asian context, few studies have evaluated gum chewing after caesarean section under general anaesthesia, which makes the current findings especially relevant. A study from India by Gayathri et al.[15] also found earlier return of bowel movements among gum chewers, but the reduction in time was smaller compared with the nearly four-hour difference seen in this study. The variation may be due to differences in anaesthesia techniques, postoperative pain management, and patient characteristics.[16,17] Despite these differences, the overall direction of effect remains consistent, suggesting that gum chewing is beneficial across different healthcare settings. In Pakistan, only a limited number of small-scale studies have explored postoperative gut motility, and very few have examined the effect of gum chewing.[4] The present study therefore provides important local evidence and fills a notable gap in the national literature by demonstrating statistically significant improvement across multiple gastrointestinal recovery parameters. The overall message of this study is that gum chewing is a simple, safe, inexpensive, and effective method to stimulate gut motility and improve postoperative recovery after caesarean section under general anaesthesia. It shortened the time to bowel sounds, reduced the time to passage of flatus, promoted earlier oral intake, and decreased abdominal discomfort with strong statistical significance. [18] This study adds new value to the existing medical literature by providing robust local evidence from a quasi-experimental design within a Pakistani tertiary care setting, showing that gum chewing can be successfully integrated into routine postoperative care to enhance gastrointestinal recovery, reduce patient discomfort, and potentially support earlier mobilization and discharge.

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