DOI: https://doi.org/10.53350/pjmhs02024181761

ORIGINAL ARTICLE

Effect of Gum Chewing for Early Restoration of Bowel Activity after Cesarean Section

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ABSTRACT

Background: Postoperative ileus is a common concern following cesarean section, leading to delayed gastrointestinal recovery. Chewing gum has emerged as a simple and non-invasive intervention to enhance bowel motility through the cephalic vagal reflex and stimulation of gastrointestinal hormone secretion, thereby promoting the early return of bowel sounds and passage of flatus.

Objective: This study aimed to compare the mean postoperative time interval for the return of bowel sounds and the first passage of flatus between women who chewed gum and those who did not following a cesarean section.

Methods: A prospective, randomized controlled trial was conducted at the Department of Obstetrics and Gynecology, Bahawalpur Victoria Hospital, Bahawalpur, over a six-month period after ethical approval. A total of 60 women aged 18 to 40 years undergoing elective cesarean section were included. Patients with electrolyte imbalances, diabetes, or prior intra-abdominal surgery were excluded. Participants were randomly allocated into two groups: Group A (gum chewing) and Group B (non-gum chewing). Women in Group A received one stick (5 grams) of chewing gum three times a day for one hour, starting six hours postoperatively, while Group B received standard postoperative care without gum chewing. The primary outcomes were the mean time to the first auscultation of normal bowel sounds and the first passage of flatus.

Results: The mean age of patients in Group A was 30.20 ± 4.24 years, and in Group B, it was 29.87 ± 4.28 years. The mean time to the return of bowel sounds in Group A was significantly shorter (10.60 ± 1.90 hours) compared to Group B (16.03 ± 2.63 hours) ($p < 0.0001$). Similarly, the mean time to the first passage of flatus was significantly reduced in Group A (18.67 ± 2.38 hours) compared to Group B (25.63 ± 2.89 hours) ($p < 0.0001$).

Conclusion: Chewing gum significantly reduces the time to the return of bowel sounds and the first passage of flatus following cesarean section, suggesting its effectiveness as a simple and safe intervention to enhance postoperative gastrointestinal recovery.

Keywords: Cesarean section, chewing gum, gastrointestinal motility, postoperative ileus, passage of flatus.

INTRODUCTION

Cesarean section (CS) is one of the most commonly performed obstetric procedures worldwide, with an increasing trend in developing countries, including Pakistan. The postoperative recovery period following CS is often associated with gastrointestinal complications such as postoperative ileus (POI), characterized by delayed bowel motility, abdominal discomfort, and bloating[1]. POI prolongs hospital stays, increases patient discomfort, and adds to the healthcare burden in resource-limited settings[2]. Given the high rate of CS in Pakistan, exploring simple and cost-effective strategies for early bowel function restoration is crucial for optimizing maternal recovery and reducing hospital stays.

Gum chewing has emerged as a safe, inexpensive, and physiologically effective intervention for early recovery of bowel function after abdominal surgery. This practice, known as sham feeding, stimulates the cephalic-vagal reflex and increases the release of gastrointestinal hormones, such as gastrin and neurotensin, thereby enhancing bowel motility and reducing the duration of POI[3]. Several studies have demonstrated that gum chewing after cesarean section significantly reduces the time to first flatus, bowel sounds, and first defecation, indicating improved gut motility[4]. However, limited research has been conducted on this intervention in the Pakistani obstetric population, where prolonged postoperative recovery due to dietary habits, low mobility, and inadequate early ambulation practices is common[5].

The rate of cesarean deliveries in Pakistan has increased significantly, with a reported 15–25% prevalence in tertiary care hospitals[6]. Many postpartum women experience discomfort due to delayed bowel function, exacerbated by nutritional deficiencies, Cultural dietary restrictions, and reduced postoperative mobility[7]. Current postoperative practices in Pakistan primarily focus on gradual oral feeding and ambulation, but adjunct interventions like gum chewing remain underutilized despite their potential benefits. Implementing non-pharmacological measures like gum chewing could serve as a valuable approach to enhance early postoperative recovery, improve maternal comfort, and reduce the length of hospital stay[8].

Internationally, a growing body of evidence supports the role of gum chewing in accelerating gastrointestinal recovery after abdominal surgery. A meta-analysis of randomized controlled trials (RCTs) reported that gum chewing after CS significantly reduced the time to first flatus by approximately 6–12 hours[9]. Another study found that women who chewed gum postoperatively had a 35% reduction in POI duration compared to those receiving standard postoperative care[10]. Despite these promising findings, the implementation of this practice remains inconsistent in low- and middle-income countries (LMICs) like Pakistan, where traditional dietary restrictions post-surgery may influence bowel recovery[11].
This study aims to evaluate the effect of gum chewing on the early restoration of bowel activity following cesarean section in Pakistani women. By assessing its impact on the time to first flatus, first defecation, and first bowel sounds, this research will provide evidence for integrating gum chewing into standard postoperative protocols to enhance maternal recovery and reduce hospital stays. The findings will help in developing cost-effective, non-invasive, and patient-friendly strategies for managing postoperative ileus in obstetric practice in Pakistan.

METHODOLOGY

This randomized placebo-controlled trial was conducted in the Department of Obstetrics and Gynecology at Bahawalpur Victoria Hospital, Bahawalpur, from May 12, 2018, to November 11, 2018. A total of 60 patients undergoing cesarean section under spinal

Received on 15-08-2023
Accepted on 29-12-2023

anesthesia were included in the study, with 30 patients assigned to each group. The sample size was determined using a 95% confidence level and 80% power of the test, based on a previously reported difference in the postoperative time interval to the initial hearing of normal intestinal sounds between gum-chewing and non-gum-chewing groups. The sampling technique used was non-probability consecutive sampling.

Eligible participants included women aged 18 to 40 years who had undergone cesarean section under spinal anesthesia and were alert and attentive enough to follow instructions. Patients with diabetes (HbA1c ≥ 6.5% or previously diagnosed cases), electrolyte imbalance prior to surgery (serum potassium < 3.5 mEq/L, serum sodium < 130 mEq/L), or those requiring extensive intra-abdominal surgery due to intraoperative complications were excluded from the study. Approval was obtained from the institutional ethics review committee, and all participants provided written informed consent before enrollment.

Participants were randomly assigned to either the intervention group (Group A) or the control group (Group B) using a random number table. Patients in Group A received one stick (5 grams) of chewing gum three times a day for one hour, beginning six hours postoperatively, in addition to standard postoperative care. Standard care included nil per oral status, intravenous fluid administration, analgesia, and monitoring and correction of serum electrolyte levels until the resolution of ileus and passage of flatus. Patients in Group B received standard postoperative care without chewing gum. The primary outcomes were the postoperative time interval to the initial hearing of normal intestinal sounds and the time interval to the first passage of flatus. The researcher directly observed and recorded these outcomes for each participant.

Data were collected using a structured proforma, including demographic details and clinical variables. Statistical analysis was performed using SPSS version 20. Continuous variables such as age, parity, number of previous cesarean sections, BMI, postoperative time interval to the initial hearing of normal intestinal sounds, and postoperative time interval to the first passage of flatus were presented as mean and standard deviation. Categorical variables, including gestational diabetes mellitus, pregnancy-induced hypertension, and place of residence (rural or urban), were presented as frequencies and percentages. The independent samples t-test was used to compare the mean postoperative time interval to the first hearing of normal intestinal sounds and the first passage of flatus between the two groups, with a p-value of <0.05 considered statistically significant. Further stratification was performed based on age, parity, number of previous cesarean sections, BMI, gestational diabetes mellitus, pregnancy-induced hypertension, and place of residence to assess their potential influence on the outcomes. Post-stratification analysis was conducted using the student's t-test, with a significance level of $p < 0.05$.

RESULTS

Table 1: presents the demographic characteristics of the study population, including age, parity, previous cesarean sections (CS), BMI, place of living, and comorbidities such as pregnancy-induced hypertension (PIH) and gestational diabetes mellitus (GDM). The distribution between Set A (gum chewing) and Set B (non-gum chewing) groups is comparable, ensuring a balanced study population.

Table 2: compares the mean time intervals for the return of bowel sounds and the passage of first flatus after cesarean section. The gum-chewing group (Set A) demonstrated a significantly shorter time to the initial hearing of normal intestinal sounds (10.60 ± 1.90 hours) and first passage of flatus (18.67 ± 2.38 hours) compared to the non-gum chewing group (Set B) ($p=0.0001$).

Table 3: provides the stratification of postoperative time to the initial hearing of bowel sounds across different variables. Across all subgroups, Set A consistently exhibited a shorter recovery time than Set B, with statistically significant differences ($p=0.0001$).

Table 4: presents the stratification of time to the first passage of flatus based on different patient characteristics. In all categories, the gum-chewing group showed significantly faster recovery, reinforcing the effectiveness of gum chewing in early postoperative bowel function restoration ($p=0.0001$).

Table 1 Demographics of the study population

Construct	Category	Set A (n=30) – No. of Patients (%)	Set B (n=30) – No. of Patients (%)	Sum (n=60) – No. of Patients (%)
Age Group	18-30 years	14 (46.67%)	16 (53.33%)	30 (50.0%)
	31-40 years	16 (53.33%)	14 (46.67%)	30 (50.0%)
	Mean ± SD	30.20 ± 4.24	29.87 ± 4.28	30.3 ± 4.25
Parity	0-3	16 (53.33%)	20 (66.67%)	36 (60.0%)
	>3	14 (46.67%)	10 (33.33%)	24 (40.0%)
	Mean ± SD	3.57 ± 0.68	3.73 ± 0.69	3.61 ± 0.68
Previous CS	0-2	19 (63.33%)	20 (66.67%)	39 (65.0%)
	>2	11 (36.67%)	10 (33.33%)	21 (35.0%)
	Mean ±SD	2.47 ± 0.68	2.47 ± 0.73	2.47 ± 0.71
BMI	<28.8	12 (40.0%)	09 (30.0%)	21 (35.0%)
	> 28.8	18 (60.0%)	21 (70.0%)	39 (65.0%)
	Mean ± SD	28.80 ± 2.67	29.00 ± 2.13	28.92 ± 2.33
Place of Living	Rural	16 (53.33%)	16 (53.33%)	32 (53.33%)
	Urban	14 (46.67%)	14 (46.67%)	28 (46.67%)
PIH	Yes	15 (50.0%)	17 (56.67%)	32 (53.33%)
	No	15 (50.0%)	13 (43.33%)	28 (46.67%)
GDM	Yes	18 (60.0%)	15 (50.0%)	33 (55.0%)
	No	12 (40.0%)	15 (50.0%)	27 (45.0%)

Table 2: Comparison of mean time interval for return of bowel sound and path of first flatus after cesarean section in women with gum chewing versus without gum chewing.

	Set A (n=30)	Set B (n=30)	p-value
	Average ± SD	Average ± SD	
Time intermission to initial hearing of normal intestinal sounds (hours)	10.60 ± 1.90	16.03 ± 2.63	0.0001
Time to first path of flatus (hours)	18.67 ± 2.38	25.63 ± 2.89	0.0001

Table 3: Stratification of postoperative time interval to initial hearing of normal intestinal sounds with respect to different variables.

Variables	Set A (n=30) Time interlude to initial hearing of normal intestinal sounds (hours)			Set B (n=30) Time interlude to initial hearing of normal intestinal sounds (hours)		P-value
	Average		S.D	Average	S.D	
Age (years)	18-30	9.64	1.50	16.56	2.97	0.0001
	31-41	11.44	1.86	16.43	2.14	0.0001
Parity	0-3	10.31	1.89	16.08	2.78	0.0001
	>3	10.93	1.94	16.00	2.61	0.0001
Numbers of previous CS	0-2	10.53	1.81	16.45	2.74	0.0001
	>2	10.73	2.15	15.20	2.30	0.0001
BMI	≤27	10.58	2.19	17.22	2.91	0.0001
	>27	10.61	1.75	15.52	2.40	0.0001
PIH	Yes	11.33	1.95	16.31	2.75	0.0001
	No	9.87	1.67	15.82	2.60	0.0001
GDM	Yes	10.83	1.40	16.13	2.56	0.0001

	No	10.44	2.20	15.93	2.79	0.0001
Place of living	Rural	10.38	1.86	16.06	2.14	0.0001
	Urban	10.86	1.99	16.00	3.19	0.0001

Table 4: Stratification of postoperative time interval to first hearing of normal intestinal sounds with respect to different variables.

Variables		Set A (n=30)		Set B (n=30)		P-value
		Time interval to initial hearing of normal intestinal sounds (hours)		Time interval to initial hearing of normal intestinal sounds (hours)		
		Average	S.D	Average	S.D	
Age (years)	18-30	17.64	2.50	25.25	2.65	0.0001
	31-41	19.56	1.93	26.07	3.20	0.0001
Parity	0-3	18.50	2.42	25.58	3.26	0.0001
	>3	18.86	2.41	25.67	2.72	0.0001
Numbers of previous CS	0-2	18.68	2.29	25.80	3.02	0.0001
	>2	18.64	2.66	25.30	2.75	0.0001
BMI	≤27	19.25	2.63	25.78	2.64	0.0001
	>27	18.28	2.19	25.57	3.06	0.0001
PIH	Yes	19.07	2.22	25.31	2.75	0.0001
	No	18.27	2.55	25.88	3.06	0.0001
GDM	Yes	18.58	2.07	26.00	2.88	0.0001
	No	18.72	2.63	25.27	2.96	0.0001
Place of living	Rural	18.63	2.39	25.56	2.48	0.0001
	Urban	18.71	2.46	25.71	2.41	0.0001

DISCUSSION

Our study demonstrates that gum chewing significantly accelerates the recovery of bowel function following cesarean section. The gum-chewing group (Set A) experienced earlier returns of bowel sounds and passage of flatus compared to the non-gum-chewing group (Set B). These findings align with previous research and add to the growing evidence supporting the efficacy of gum chewing in postoperative recovery.

In our study, the gum-chewing group had a mean time of 10.60 ± 1.90 hours to the initial hearing of normal intestinal sounds, compared to 16.03 ± 2.63 hours in the non-gum-chewing group. This reduction is consistent with a meta-analysis by Wen et al., which reported that gum chewing reduced the time to first bowel sound by approximately 4.19 hours (95% CI: -6.41 to -1.97)[12]. Similarly, Zhang et al. reported that the time to first bowel sound in gum-chewing groups ranged between 9.8 to 12.5 hours, whereas in control groups, it was 15.7 to 18.2 hours, demonstrating a statistically significant benefit[13]. The time to first passage of flatus in our study was also significantly shorter in the gum-chewing group (18.67 ± 2.38 hours) compared to the control group (25.63 ± 2.89 hours). Wen et al. found that gum chewing reduced the time to first passage of flatus by approximately 5.91 hours (95% CI: -7.08 to -4.73) (12). Another systematic review by Craciunas et al. reported a mean time of 19.2 ± 3.1 hours in gum-chewing groups and 26.1 ± 4.2 hours in non-chewing groups, further supporting our findings[14].

Although our study did not specifically measure the time to first defecation, previous research has shown that gum chewing can reduce this interval by approximately 7.91 hours (95% CI: -11.14 to -4.67) (12). A Cochrane review by Morais et al. reported a reduction in the time to first defecation by 8.5 to 10.2 hours in gum-chewing groups compared to control groups[15]. Additionally, while hospital stay duration was not assessed in our study, past studies suggest that gum chewing may shorten hospital stays by about 0.30 days (95% CI: -0.46 to -0.14) (12). A meta-analysis by Zhu et al. also found that gum-chewing post-cesarean section resulted in a 0.5-day reduction in hospital stay[16].

The beneficial effects of gum chewing are attributed to the concept of sham feeding, where chewing stimulates the cephalic-vagal reflex, leading to increased secretion of gastrointestinal hormones and enhanced bowel motility[17]. The act of chewing also promotes peristalsis, increases saliva production, and enhances digestion through reflex pathways in the enteric nervous system[18]. A study by Huang et al. found that gum chewing increased bowel motility rates by 30-40% postoperatively, reducing the likelihood of postoperative ileus[19]. Li et al. further confirmed that gum chewing significantly increases gastrointestinal motility index values within the first 12-24 hours post-surgery[20].

Our study reinforces existing evidence that gum chewing is an effective strategy for promoting early return of bowel function after cesarean section. Implementing this practice could lead to improved patient comfort and potentially shorter hospital stays. Given its simplicity, cost-effectiveness, and non-invasive nature, gum chewing should be considered a routine intervention in postoperative care.

CONCLUSION

The average time delay between the return of bowel sound and the passing of the first flatus following caesarean section is shorter in women who chew gum than in women who do not chew gum, according to this study. As a result, we urge that every woman undergoing caesarean section in our normal practice be encouraged to chew her gums post-operatively in order to restore bowel function as soon as possible in order to prevent post-cesarean morbidity.

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This article may be cited as: Dilshad A, Yasmin S, Babar N, Ayesha G; Effect of Gum Chewing for Early Restoration of Bowel Activity after Cesarean Section Pak J Med Health Sci, 2023; 18(1): 761-764.