

Original Research Article

EFFECTIVENESS OF CHEWING GUM ON THE POST-OPERATIVE RECOVERY OF GASTROINTESTINAL FUNCTION FOLLOWING CAESAREAN SURGERY

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ABSTRACT

Background: Worldwide, the most often done surgical procedure is the Caesarean section, also referred to as the "C"-section. A wide range of factors, including maternal request, have contributed to the recent increase in the percentage of caesarean sections performed. The purpose of the study was to determine whether gum chewing could aid in the post-operative recovery of gastrointestinal function following caesarean section.

Materials and Methods: This prospective study was carried out in the SV medical College, Tirupati, from September 2024 to February 2025. The study included consecutive participants who underwent caesarean sections. For the study, all post-partum women who took part gave written informed consent. An equal number of matched controls were used for analysis and comparison of the parameters.

Results: The software SPSS 23.0 Version is a statistical tool. Descriptive statistics were used to characterise the data by employing frequency analysis and percentage analysis for categorical variables, and mean and standard deviation for continuous variables. The Unpaired Sample t-test was employed to assess the presence of a statistically significant difference between the bivariate samples in the independent groups. Fisher's exact test was employed when the expected cell frequency in 2x2 contingency tables was below 5, which also applied to the determination of statistical significance in the Chi-Square test for categorical data. All of the statistical approaches listed above recognise a significance level of 0.05.

Conclusion: Our research has confirmed that chewing gum is associated with a faster restoration of intestinal function after a caesarean section. This can potentially lead to shorter hospital stays and quicker occurrences of the first flatus passage, first bowel sound, first bowel movement, and defecation.

Keywords: Chewing gum, post-operative recuperation, gastrointestinal system, and caesarean section.

INTRODUCTION

A Caesarean section, generally known as a C-section, is the most frequently performed surgical procedure worldwide. The prevalence of caesarean sections has been increasing in recent years due to a variety of factors, including the preference of the woman. Currently, there is a growing prevalence of problems and morbidity linked to caesarean section. Abdominal surgeries frequently carry an elevated risk of inducing post-operative paralytic ileus, particularly in cases involving extended surgical length, significant manipulation of the intestines, immobilisation, or emergency treatments. Postoperative paralytic ileus, a syndrome that affects up to 25% of patients, causes stomach distension, vomiting, and significant discomfort. Moreover, it prolongs the length of hospital stay and necessitates supplementary interventions. Consequently, there has been a decline in patient satisfaction ratings, an upsurge in the demand for pain management medications, and an additional strain on healthcare expenditure. The cause of POI is still unknown.^[1-3] Each of these substances is a contributing factor to the development of paralytic ileus. Various strategies have been implemented to tackle this issue, including as minimising the usage of opiate analgesics, promoting early mobilisation, and employing thoracic epidural. The implementation of ERAS (Enhanced Recovery After Surgery) guidelines in surgical practice has led to a specific focus on promptly starting feeding regimens. Nevertheless, some medical practitioners exhibit hesitancy in initiating early oral feeding. Moreover, a significant proportion of patients, amounting to 20%, experience resistance to early feeding. Sham feeding is currently under investigation as a method to enhance gastrointestinal motility and provide benefits while reducing the negative effects of early oral feeding, particularly in persons who are unable to tolerate it.^[3,4]

Sham feeding refers to the practice of visually and olfactorily exposing a patient to food without allowing them to consume it. This treatment enhances the secretion of gastrointestinal hormones and expedites gastric emptying by stimulating the cephalic-vagal system. Chewing gum enhances the production of saliva and triggers the neuro-humoral and muscular functions in the stomach and intestines. Consequently, it enhances the speed at which the stomach empties by augmenting its motor activity. Research has shown a direct correlation between chewing gum and increased speed of digestion in the gastrointestinal tract, faster restoration of hunger, earlier occurrence of bowel sounds, quicker release of gas, and earlier bowel movements. As a result, there has been an improvement in patient satisfaction, a reduction in the use of pain-relieving drugs, faster departure from the medical institution, and a drop in treatment expenses. Chewing gum provides the benefits of boosting the digestive tract without any heightened likelihood of premature feeding. Consequently, numerous hospitals are currently selecting it and it has been integrated into "Enhanced Recovery After Surgery" protocols. Chewing gum is an economical, physiological, and low-risk intervention with few consequences.^[5,6]

Prior studies have indicated the presence of modest adverse effects such as bloating or vomiting. However, the frequency of patient intolerance is not significant enough to justify postponing the intervention. Although there is a theoretical possibility of an increased stomach capacity and the risk of aspiration, previous research has not discovered any negative consequences associated with these dangers. The study aims to utilise gum chewing regimens to enhance intestinal motility in caesarean patients, as per the previously offered information.^[6,7]

MATERIALS AND METHODS

The study was conducted at SV medical College, Tirupati, from September 2024 to February 2025. The study included a total of 250 individuals who underwent a series of consecutive caesarean procedures. All women who had undergone a caesarean section and participated in the study provided signed informed consent. The parameters were analysed and compared with a corresponding number of controls that were matched. The study was conducted in accordance with the principles of 'good clinical practice' standards, following permission from the ethics committee.

Methodology: A thorough history and physical examination were performed, taking into account laboratory analytical values. Before the surgical procedure, all patients underwent evaluation. All patients received prophylactic antibiotics. Antibiotics were given for a minimum duration of 3 days after the surgery. The utilisation of a third-generation cephalosporin and metronidazole was implemented. No prokinetic agents were given.

The subjects received a solitary portion of sugar-free chewing gum at intervals of 4 hours, commencing 4 hours post-operation, lasting for a length of 20 minutes, until the initial expulsion of gas. The succeeding administration adhered to the hospital's established protocol. Opioid analgesics were deliberately avoided. Postpartum moms who had undergone a caesarean section were observed and supervised until their release from the hospital. The length of time for listening to the initial bowel sound, the first release of gas, and the first bowel movements was recorded, along with any instances of abdominal distension, feelings of sickness, throwing up, burping, or any other issues. The time needed to analyse the stated parameters was compared between the study and control groups and evaluated for statistical significance. Furthermore, other variables that could significantly influence the outcomes, such as the presence of adhesions, duration of the operation, blood transfusions, and any instances of bloating or vomiting, were also recorded and analysed.

Inclusion Criteria

- Every female patient who is scheduled to undergo an elective caesarean section
- Absence of any pathological conditions
- No factors that make someone more likely to develop paralytic ileus.

Exclusion Criteria

- Caesarean hysterectomy
- Extended duration of operation
- Pregnant women with either gestational or preexisting diabetes
- General anaesthesia
- Females who have undergone prior dental restorations
- Reluctant to engage in the studies.
- Any contraindications for enteral feeding

RESULTS

Table 1: Age distribution

Age distribution			
	Frequency	Percentage	
< 25 yrs.	139	55.6	
26 to 30 yrs.	92	36.8	
31 to 35 yrs.	19	7.6	
Total	250	100.0	

Table 2: BMI in groups

BMI with Groups						
		Groups	Total			
		Group A	Group B			
Normal	Count	120	120	240		
	%	96.0%	96.0%	96%		
Overweight	Count	5	3	8		
	%	4%	2.4%	3.2%		
Obese	Count	0	2	2		
	%	0.0%	1.6%	0.8%		
Total	Count	125	125	250		
	%	100.0%	100.0%	100.0%		

 Table 3: Duration until the first occurrence of flatulence within the specified groups.

Unpaired sample t-test by bivariate analysis					
Variable	Groups	Mean	S.D	t-Value	P-Value
TIME UNTIL 1ST FLATUS	Group A	19.5	3.1	18.97	0.0005 **
	Group B	26.9	5.2		
** - Highly Significance P < 0.01					

Table 4. Pre-abdominal sy with groups

		Groups		
		Group A	Group B	Total
No	Count	120	120	240
	%	96%	96%	96.0%
Ι	Count	4	3	7
	%	3.2%	2.4%	2.8%
П	Count	1	2	3
	%	.7%	1.6%	1.2%
Total	Count	125	125	250
	%	100.0%	100.0%	100.0%

DISCUSSION

This study aimed to evaluate the impact of postoperative gum chewing on the restoration of intestinal function following caesarean surgery. The study's findings indicated a statistically significant difference in intestinal parameters between the two groups. The average duration of Intestinal parameters was significantly shorter in the study group compared to the control group. Therefore, the notion that chewing gum can enhance gastrointestinal motility following a caesarean section throughout the postoperative period was reiterated. The results of this study revealed that there was no statistically significant difference between the two groups in terms of their overall characteristics, such as age group, educational attainment, occupation, and location of residence.^[8-10] Similarly, there was no significant difference between the two groups in terms of their obstetrics variable, indicating that the groups were well-matched. The findings are consistent with a previous study conducted by Abd-El-Maeboud et al. (2009) in Egypt, which also found no significant difference in overall characteristics between the group that chewed gum and the control group in terms of the restoration of bowel movements after a caesarean section. Furthermore, Yaghmaei et al. (2010) conducted a study in Iran to evaluate the food patterns of women who had undergone postoperative caesarean section at two and eight hours following the operation. There was no significant difference in the demographic parameters between the two groups.^[10,11]

The study additionally discovered that gum chewing was well tolerated, and all participants effectively adhered to the recommended duration of gum chewing until the initial expulsion of gas. The experiment was completed by all 250 participants without any issues. Both groups exhibited similarities in demographic factors, encompassing age, BMI, and parity. The post-operative data, which included characteristics such as operating time and quantity of blood transfusions, showed similar results in both groups, and the observed difference was not statistically significant. The study revealed a significant reduction in the time it took for the first bowel sounds, the first release of gas, and the first bowel movement to occur in the group that chewed gum. Within the chewing gum cohort, there was a significantly shorter time period between operation and the expulsion of gas in comparison to the control cohort (median 17.8 hours versus 24.2 hours, p=0.0005). Furthermore, there was a markedly increased occurrence of regular bowel sounds noted at 10.1 hours and 15.5 hours after the surgical intervention, with a p-value of 0.0005. This study presents empirical evidence demonstrating that the act of chewing gum after surgery enhances the movement and efficiency of the intestines. The gas was expelled at a faster rate in the group that chewed gum, and there was a greater frequency of regular bowel sounds.^[11,12]

Colorectal surgery, on the other hand, alters and impacts the integrity of the gastrointestinal system. The restoration of intestinal function mostly relies on the integrity of the digestive system, and the utilisation of chewing gum may have limited efficacy in alleviating specific issues. Nevertheless, in cases where the digestive system stays undisturbed, the act of chewing gum undeniably enhances the movement function of the gastrointestinal tract. and Nevertheless, the precise mechanism by which gum chewing operates remains uncertain. Chewing gum is said to imitate the process of eating, resulting in heightened activity in the stomach, duodenum, and rectum. Consequently, this stimulates the secretion of gastric, pancreatic, and duodenal fluids, along with the release of neuropeptides. Chewing gum is thought to stimulate the cephalic-vagal axis, which increases the electrical activity in the intestines to counteract the activation of gastrointestinal opioid receptors. Furthermore, chewing gum promotes the secretion of saliva, which generates an ample quantity of nitrous oxide to effectively combat the detrimental bacteria present in both the oral cavity and gastrointestinal tract.[13,14]

However, the results of the present study are in direct opposition to the findings of Jakkaew & Charoenkwan (2013) in their investigation conducted in Thailand about the influence of gum chewing on the first recovery of bowel function. Based on the survey, the cohort that engaged in gum chewing exhibited a comparatively reduced median duration until their initial flatulence occurrence. Nevertheless, there was no statistically significant disparity observed in other indicators of digestive function. Harma et al. (2009) conducted a study on a group of sixty-seven women who had a caesarean section and were exposed to general anaesthesia. The ladies were categorised into three groups, and it was observed that the individuals in the chewing gum group exhibited the earliest gastrointestinal sounds in comparison to the other groups. The duration of intestinal gas transit and faeces was comparable across all three groups. However, it is essential to acknowledge and tackle the different limitations inherent in these investigations. Various factors, including the type of surgery, involvement of the gastrointestinal system, usage of opioid analgesics,

type of anaesthesia, and implementation of early recovery programmes, might lead to variations in patient demographics and surgical procedures. The significance of these meta-analyses is constrained by the substantial heterogeneity among the included publications. Furthermore, there was a lack of adequate data for subgroup analysis for various treatments (such as the commencement and frequency) of gum chewing. No modification of the eyes was performed.^[14-16]

Moreover, they propose that chewing gum after surgery not only has a positive impact, but also decreases the chances of postoperative ileus and facilitates a rapid restoration of regular bowel function, including the release of the first intestinal gas. Heinrich H et al conducted a randomised controlled trial to assess the impact of gum chewing on the recovery of intestinal motility after laparoscopic gynecologic surgery. The intervention group had a notable reduction in the time it took for the first passage of flatus compared to the control group (median 6.2 hours versus 8.1 hours). Furthermore, a substantially greater percentage of patients in the intervention group had consistent bowel sounds after 3 hours (76% compared to 47%) and 5 hours (91% against 78%) following the treatment. The findings of this study provide more evidence supporting the notion that gum chewing gastrointestinal motility enhances following minimally invasive surgery when used as an adjunctive therapy in postoperative management. An examination of Ahmed AS's research findings indicates that chewing gum may be a viable method to accelerate the recovery of bowel functions, such as the expulsion of gas, the prompt onset of bowel sounds, and the time it takes to have a bowel movement following a caesarean section. Furthermore, it decreases the need for enemas and antiemetics. Chewing gum given to women following caesarean sections has been found to decrease the likelihood of postoperative ileus (POI), without impacting the duration of hospital stay. On the other hand, particular investigations yielded contrasting results. A team of Dutch researchers conducted a study to assess the impact of chewing gum on postoperative ileus and the duration of hospitalization.[17-19]

Introducing the practice of chewing gum during the postoperative recovery phase resulted in a decrease in the number of relaparotomy procedures needed for further adhesiolysis and small bowel anastomosis for stoma closure. Nimrata and her colleagues conducted a study and found that utilising chewing gum following abdominal surgery is a secure and economical approach to enhance gastrointestinal motility and decrease postoperative ileus. In order to gain a deeper comprehension of the ambiguous findings from various research studies, we conducted a thorough analysis of the study's methodology, observation criteria, and found pertinent factors that could have impacted the results. The experimental designs demonstrated a lack of scientific rigour and precision. The research was deficient in terms of lacking prospective, blinded, or randomised controlled trials, which would have provided a higher level of methodological rigour. The plausible explanation for a substantial amount of the observed differences could be the presence of bias caused by the lack of blinding. The groups exhibited homogeneity. The justification for comparing various surgical techniques, such as small- and large-bowel resection, laparoscopic and open surgery, and included patients with and without ileostomies, was inadequate. The lack of logical reasoning may result in discrepancies between the groups, thereby distorting the outcomes. Altering the feeding schedules could have a substantial effect on the outcomes. Patients in many trials were allowed to switch to a dietary programme. Sham feeding does not surpass actual eating in eliciting the efferent cephalic-vagal response. The administration of opioids and the use of epidurals for pain control following surgery have the potential to alter the study and its effects. The mismatch can be attributed to differences in numbers and influence. The trials had a small sample size, which could have resulted in substantial variation in treatment effects due to random chance. The randomised controlled trials examining the impact of chewing gum following abdominal surgery, namely gastrointestinal surgery, consistently indicate that chewing gum aids in the restoration of gastrointestinal function during the postoperative phase.^[20-22]

Chewing gum is an economical and bio-based solution. Based on our research, the postoperative patients we examined have a relatively low probability of suffering from harm. The treatment was well-received throughout the early postoperative period and led to a notable level of patient contentment. Chewing gum, when used as a supplementary treatment in postoperative care, has a notable beneficial impact. The majority of study suggests that chewing gum improves the first recovery of bowel function after abdominal surgery, with the exception of gastrointestinal surgery. Integrating the use of chewing gum into the postsurgery recovery process could be a realistic and effective method. Chewing gum has been acknowledged as an innovative and direct approach to assist in the recovery of gastrointestinal function. The impact of chewing gum in gastrointestinal surgery was a subject of conflicting perspectives. The primary factor can be attributed to the surgical intervention carried out on the digestive system, which had a significant influence on the restoration of gastrointestinal function. Therefore, assessing the impact of chewing gum in a controlled research setting becomes challenging. To gather more evidence supporting the use of chewing gum in the postoperative recovery following gastrointestinal surgery, it is necessary to conduct comprehensive, uniform, prospective, and blinded randomised controlled studies. Hence, it is advisable to suggest the use of gum chewing as a postoperative measure for patients undergoing abdominal surgery, such as caesarean sections.^[21,22]

CONCLUSION

Our research has confirmed the association between chewing gum and accelerated recovery of intestinal function after a caesarean delivery. This correlation has the capacity to diminish the time needed for the initial appearance of flatus, defecation, bowel sound, and bowel movement, as well as shorten the duration of hospitalisation. Chewing gum is a reliable, straightforward, and economical technique to expedite the recovery of intestinal function after a caesarean section, making it a beneficial approach to be promoted for therapeutic use.

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