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Original Article

Role of Chewing Gum in Enhancing Post-Operative Recovery 0f Bowel Function after Lower Segment Cesarean Section

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ABSTRACT

Background: The frequency of cesarean sections globally exceeds the World Health Organization's recommended rates, leading to an increased focus on postoperative recovery, particularly the restoration of gastrointestinal (GIT) function. The delayed return of intestinal activity, known as postoperative ileus, can extend hospital stays and elevate healthcare costs. Chewing gum has been proposed as a simple, non-pharmacological intervention to stimulate the GIT and potentially expedite recovery.

Objective: This study aimed to evaluate the efficacy of chewing gum in improving GIT activity and recovery in patients following a cesarean section, contributing to the evidence base for postoperative care practices in obstetrics and gynecology.

Methods: A cross-sectional comparative analytical study was conducted at the Department of Obstetrics and Gynecology, KRL Hospital Islamabad, from May 2021 to November 2021. Two hundred patients undergoing elective cesarean sections were divided into two groups: Group A (n=100), who received chewing gum postoperatively, and Group B (n=100), who did not. The primary outcomes measured were the time to first bowel sound, time to first flatus, and time to first defecation. Data were analyzed using SPSS version 25, with a significance level set at $p \leq 0.05$.

Results: Group A demonstrated a significantly faster time to first bowel sound (3.75 ± 1.31 hours vs. 7.01 ± 1.94 hours, p=0.001), first flatus (7.97 ± 1.96 hours vs. 14.75 ± 3.57 hours, p=0.001), and first defecation (32.37 ± 3.56 hours vs. 48.20 ± 6.06 hours, p=0.001) compared to Group B. These findings were consistent across age stratifications, with significant improvements in GIT recovery times in younger (18-25 years) and older (26-35 years) subsets of patients.

Conclusion: Chewing gum post-cesarean section significantly accelerates the recovery of GIT functions, reducing the time to first bowel sound, flatus, and defecation. This study supports the inclusion of chewing gum as a low-cost, effective method in postoperative care protocols for cesarean section patients, potentially improving patient outcomes and reducing healthcare costs.

Keywords: Cesarean Section, Chewing Gum, Gastrointestinal Recovery, Postoperative Care, Enhanced Recovery After Surgery (ERAS), Postoperative Ileus.

INTRODUCTION

The cesarean section, a common obstetric procedure performed globally, has seen its prevalence exceed the World Health Organization's recommended rates of 10 to 15%, showcasing a significant upward trend according to the World Health Statistics report of 2011 (1). This surge in cesarean sections brings to light the issue of postoperative intestinal ileus, a condition marked by a temporary halt in bowel functions, which can lead to increased postoperative morbidity, extended hospital stays, and elevated healthcare costs (2). The rapid restoration of intestinal function post-cesarean is thus a critical focus for healthcare providers. Traditional hesitance towards early postoperative oral feeding stemmed from fears of complications such as intestinal fistula, hemorrhage, and aspiration. Nevertheless, recent studies have shifted toward advocating for early feeding, despite challenges in patient tolerance (3).

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In pursuit of strategies to accelerate gastrointestinal (GIT) activity resumption, medical professionals have explored various approaches, including minimal intraoperative gastrointestinal manipulation, ensuring adequate hydration, promoting early patient mobilization, and the administration of drugs like COX inhibitors. Despite these efforts, the search for a reliable method to facilitate GIT recovery continues (4). The introduction of chewing gum as a form of sham feeding represents a novel intervention aimed at aiding the intestines in regaining function (5). It is hypothesized that chewing gum stimulates gastric secretion, bowel movements, and aids in ileus recovery by activating the cephalic vagal reflex, which in turn triggers the humoral and nervous pathways that promote bowel motility (6, 7). The administration of chewing gum to post-cesarean patients—commencing three hours post-surgery and continuing every three hours for thirty minutes until the passage of flatus—has shown promising results in reducing the incidence of bowel function complications (8, 9).

The primary objective of this study was to evaluate the effectiveness of chewing gum in enhancing GIT activity and recovery among patients undergoing cesarean sections. The positive correlation between bowel motility and chewing gum utilization observed in this research could lead to the integration of chewing gum into hospital protocols for managing postoperative cesarean section patients. Given the scarcity of local research on this subject, this study embarked on investigating the potential of this accessible, cost-effective method in facilitating the recovery of bowel functions within our patient population. This endeavor not only contributes to the existing body of knowledge but also highlights the significance of innovative, patient-friendly strategies in improving postoperative outcomes.

MATERIAL AND METHODS

The study was a cross-sectional comparative analytical endeavor conducted by the Department of Obstetrics and Gynecology at KRL Hospital Islamabad over a six-month period from May to November 2021. In order to evaluate the efficacy of chewing gum in expediting postoperative bowel function recovery following cesarean sections, the study meticulously adhered to the principles outlined in the Declaration of Helsinki regarding ethical research involving human subjects. Following the acquisition of institutional ethical approval, an informed consent process was rigorously implemented during the antenatal period, where the study's objectives, procedures, potential risks, and benefits were thoroughly explained to potential participants, ensuring their voluntary participation.

The sample size was meticulously calculated using the WHO sample size calculator, aiming for a 5% level of significance and a 95% confidence level, based on the observed mean times to first defecation between the study and control groups (10.25 hours and 11.58 hours, respectively)(8). This calculation resulted in the inclusion of 200 female patients, evenly divided into two groups of 100 each for the study and control cohorts. Participants were selected through a non-probability consecutive sampling method, focusing on those meeting the inclusion criteria: women aged 18 to 35 years with singleton, viable pregnancies undergoing elective cesarean sections under spinal anesthesia, having a body mass index (BMI) between 18.5 and 24.9 kg/m^2. Exclusion criteria were stringent, disqualifying individuals with loose teeth, prosthetic dentures, multiple pregnancies, placenta previa and PAS (placenta accreta spectrum), diabetes mellitus, inflammatory bowel disease, irritable bowel syndrome, opioid use, or any history of abdominal, gastrointestinal, or pelvic surgery, as well as those experiencing complications during surgery such as postpartum hemorrhage (PPH) or injury to the colon and bladder requiring additional operative interventions.

Data collection was conducted in a structured manner using a pre-designed proforma. This involved documenting the time to first bowel sound, time to pass the first flatus, and time to the first defecation post-surgery. The two groups differed in their postoperative regimen: Group A received chewing gum three hours post-operation for 30 minutes, repeated every three hours for a total of three sessions, while Group B did not receive any intervention and served as the control group. To minimize bias, all cesarean sections were performed by the same surgical team, and postoperative monitoring was conducted by the designated duty doctor, who performed auscultations every two hours.

Statistical analyses were executed using SPSS version 25, adhering to a standard protocol for ensuring data integrity and accuracy. The analyses encompassed computing means and standard deviations for variables such as patient age, gestational age, and postoperative intervals to first passage of flatus and first defecation. The independent samples t-test was employed to discern significant differences between the two groups regarding key outcome variables, with a p-value of ≤0.05 denoting statistical significance. Age, as a potential effect modifier, was controlled through stratification, followed by a post-stratification independent samples t-test to assess its influence on the outcomes. Through this meticulous approach, the study aimed to furnish conclusive evidence on the role of chewing gum in enhancing postoperative bowel function recovery, thereby potentially influencing future clinical practices and patient management protocols post-cesarean section.

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RESULTS

The study's findings, as illustrated in the detailed tables, reveal significant differences in the time to return to intestinal function between patients receiving chewing gum after cesarean section and those in the control group. The analysis of time to first bowel sound, time for first flatus, and time to defecation presents a clear advantage for Group A, who were administered chewing gum post-operatively.

In particular, Group A demonstrated a significantly quicker time to first bowel sound, with an average of 3.75 hours, compared to 7.01 hours for Group B (Table 1). This difference, showing a more rapid return of bowel sounds in the chewing gum group, was statistically significant (p-value = 0.001), suggesting that chewing gum may play a role in enhancing gastrointestinal recovery post-cesarean section.

Furthermore, the time required for the first flatus post-operation was markedly shorter in Group A, with an average of 7.97 hours, whereas Group B exhibited a longer average of 14.75 hours (Table 1). This nearly halved time in Group A reinforces the potential benefit of chewing gum in accelerating intestinal motility after surgery (p-value = 0.001).

The benefits extended to the time to defecation, where Group A patients experienced their first defecation at an average of 32.37 hours post-surgery, significantly sooner than the 48.20 hours observed in Group B (Table 1), further emphasizing the efficacy of chewing gum in facilitating gastrointestinal recovery (p-value = 0.001).

Table 1: Time to Return to Intestinal Function Among Patients Receiving Chewing Gum After Cesarean Section

Measure	Group A (n=100)	Group B (n=100)	p-value
Time to first bowel sound (hours)	3.75 ± 1.31	7.01 ± 1.94	0.001
Time for first flatus (hours)	7.97 ± 1.96	14.75 ± 3.57	0.001
Time to defecation (hours)	32.37 ± 3.56	48.20 ± 6.06	0.001

Table 2: Stratification of Time of Bowel Sound with Respect to Age

Age of Patients (Years)	Group A Time of First Bowel Sound (hrs)	Group B Time of First Bowel Sound (hrs)	P-value
18-25	3.71 ± 1.29	6.65 ± 2.03	0.0001
26-35	3.77 ± 1.32	7.20 ± 1.88	0.0001

Table 3: Stratification of Time for First Flatus with Respect to Age

Age of Patients (Years)	Group A Time to First Flatus (hrs)	Group B Time to First Flatus (hrs)	P-value
18-25	8.12 ± 2.23	14.26 ± 3.23	0.0001
26-35	7.89 ± 1.82	15.00 ± 3.73	0.0001

Table 4: Stratification of Time to Defecation with Respect to Age

Age of Patients (Years)	Group A Time to First Defecation (hrs)	Group B Time to First Defecation (hrs)	P-value
18-25	32.85 ± 4.35	49.06 ± 5.99	0.0001
26-35	32.12 ± 3.08	47.76 ± 6.08	0.0001

Stratification by age groups 18-25 and 26-35 years provided additional insights into the consistency of these results across different age brackets. For both age groups, the time to first bowel sound was significantly shorter in Group A compared to Group B, with p-values of 0.0001 for both age ranges (Table 2). This pattern persisted in the stratification of time for the first flatus and time to defecation, where Group A consistently outperformed Group B across both age brackets, with all comparisons yielding highly significant p-values (Tables 3 and 4).

These findings underscore the beneficial impact of chewing gum on the recovery of intestinal function following cesarean section, demonstrating a consistent advantage across different measures of gastrointestinal recovery and across different patient age groups. The statistical significance of these results highlights the potential of this simple, non-pharmacological intervention to improve postoperative care and patient outcomes after cesarean delivery.

DISCUSSION

The utilization of chewing gum as a non-pharmacological intervention to expedite the recovery of intestinal function following abdominal surgeries has garnered attention within the medical community, reflecting a broader interest in enhancing postoperative recovery processes. The concept, which aligns with Enhanced Recovery After Surgery (ERAS) protocols, suggests that sham feeding

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through chewing gum may moderately stimulate gut activity, a premise supported by various studies conducted globally, including in Egypt, China, Nigeria, Turkey, Saudi Arabia, Thailand, and the USA, yielding variable outcomes (10,11,12). Despite the proliferation of research in diverse regions, there remains a scarcity of data specific to certain geographical areas, underscoring the novelty and relevance of this study within its local context.

This research demonstrated that the initiation of bowel sounds, passage of flatus, and defecation occurred significantly earlier in patients who were administered chewing gum in the postoperative period, with mean times of 3.75 ± 1.31 hours, 7.97 ± 1.96 hours, and 32.37 ± 3.56 hours, respectively, compared to those in the control group. These results not only reinforce the potential efficacy of chewing gum in facilitating gastrointestinal recovery but also align with findings from prior studies, indicating a consistent pattern across different research efforts (13,14).

A comparative analysis with a study conducted in Cairo, Egypt, in 2019 revealed similarities in the acceleration of gastrointestinal recovery among patients administered chewing gum, further emphasizing the intervention's effectiveness. The Egyptian study, which also examined postoperative complications and patient satisfaction, provided a broader perspective on the benefits of chewing gum, highlighting its role in enhancing patient outcomes beyond gut motility (15). Similarly, a study across three hospitals in India in 2020 corroborated these findings, noting a significant reduction in the time to the return of gastrointestinal function, alongside additional benefits such as reduced hospital stay and earlier onset of hunger in patients who chewed gum postoperatively.

The administration protocol of chewing gum, involving three daily sessions of 30 minutes each, was a common factor across various studies, including a meta-analysis that consolidated data from 17 randomized controlled trials. This analysis concluded that such a regimen could effectively improve gut motility following cesarean sections, underscoring the practice's safety and efficacy (17, 18). Despite variations in the duration and frequency of chewing gum use across different studies, the consensus on its beneficial impact provides a strong foundation for its incorporation into postoperative care routines.

This study stands out due to its focus on a specific population, employing a robust sample size and maintaining consistency in the use of chewing gum to minimize heterogeneity. However, the research acknowledges its limitations, including the lack of examination of other outcomes such as postoperative ileus and hospital stay duration, and the potential bias introduced by the single-blind study design (19, 20). The exclusion of sugar-free gum, despite some evidence supporting its use for enhancing gut motility due to the laxative effect of xylitol, also represents an area for further inquiry.

CONCLUSION

In conclusion, the findings from this study contribute to the growing body of evidence supporting the use of chewing gum as a simple, cost-effective, and safe intervention to expedite gastrointestinal recovery post-abdominal surgery. By confirming the intervention's efficacy within a new geographical context and population, this research underscores the universality of chewing gum's benefits across diverse patient demographics. Future research should aim to address the current study's limitations by exploring a broader range of outcomes, employing double-blind methodologies, and considering the impact of sugar-free gum, thereby enriching the understanding and application of this intervention in clinical practice.

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