



## Early Resumption of Food Intake After Cesarean Section Under Spinal Anesthesia: A Study on Safety, Effectiveness, and Patient Comfort

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### ABSTRACT

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**Objective:** This study aims to assess the safety and effectiveness of early food intake after cesarean section under spinal anesthesia, addressing the importance of postoperative care and patient comfort.

**Materials and methods:** A descriptive, prospective, single-center study was conducted over one year at the maternity unit of our University Hospital. A total of 157 eligible cesarean section patients under spinal anesthesia were included and divided into two groups based on their preference for resuming food intake before or after the third postoperative hour. Data on the time to resume food intake, recovery of intestinal transit, postoperative nausea and vomiting (PONV), and patient satisfaction were collected.

**Results:** Patients who resumed food intake before the third postoperative hour experienced a faster recovery of intestinal transit. No significant difference in PONV incidence was observed between the groups. High patient satisfaction was reported in both groups.

**Conclusion:** Early resumption of food intake after cesarean section under spinal anesthesia enhances intestinal transit without increasing PONV, ensuring patient comfort and postoperative care.

**KEY WORDS:** cesarean section, food intake, ileus, postoperative nausea, patient satisfaction, spinal anesthesia

### INTRODUCTION

The postoperative period following a cesarean section, like any abdominal surgery, has traditionally been characterized by prolonged fasting. However, the underlying reasons for this practice remained ambiguous, primarily based on medical conventions and concerns related to surgical complications, the onset of postoperative ileus, and the prevention of nausea and vomiting, which could compromise the healing process.

Over time, studies have indicated that early resumption of feeding post-surgery, beginning with liquids, followed by semi-liquid and solid foods, may enhance patient recovery. The potential benefits of early feeding include a faster recovery of intestinal transit, a reduction in postoperative

complications, and an overall improvement in the patient's experience.

In the context of cesarean sections, early feeding holds significant importance. Indeed, the mother must not only take care of herself but also care for her newborn, especially regarding breastfeeding. This dual responsibility emphasizes the importance of efficient recovery and optimal management after a cesarean section.

The objective of this study is to assess the safety of early resumption of feeding in patients who underwent a cesarean section under spinal anesthesia. By questioning traditional practices and exploring the potential benefits of early feeding resumption, this research contributes to improving post-cesarean care, with the goal of promoting the well-being of mothers and their newborns.

### MATERIALS AND METHODS

**Study Type:** This is a prospective, single-center, descriptive study conducted at the maternity unit of the University Hospital Center over a one-year period. The primary

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objective of this study is to assess the safety of early feeding in patients who have undergone a cesarean section under spinal anesthesia.

**Study Population:** The study included 157 patients aged over 18 years, free from major comorbidities, and without any medical-surgical contraindications to spinal anesthesia. All patients provided informed consent before participating in this protocol.

**Anesthesia and Prevention Procedures:** Cesarean sections were performed under spinal anesthesia with a maximum intravascular co-loading of 1000 ml, accompanied by the systematic administration of ephedrine for prevention and, if necessary, treatment of vasoplegia and post-spinal anesthesia hypotension. For the prevention of postoperative nausea and vomiting (PONV), dexamethasone was administered during the surgical procedure, and ondansetron (Zophren) was administered if nausea and vomiting occurred post-surgery.

**Postoperative Pain Management:** Postoperative pain management adopted a multimodal approach, including intrathecal morphine mimetics, continuous infusion of nefopam after clamping the umbilical cord, and oral analgesia including first-line analgesics such as acetaminophen and ketoprofen.

**Resumption of Feeding:** Patients were allowed to hydrate themselves one hour after the surgery if thirsty and consume a light meal (date + yogurt / light soup) from the second hour postoperatively in the absence of complications. Resumption of a regular meal was allowed from the fourth hour.

**Definition of Comparison Groups:** The distribution of patients into the two groups of interest in our study (those who started feeding before the 3rd hour post-cesarean and those beyond the 3rd hour) was based on individual patient preference. In line with our patient-centered approach, they were allowed to decide when to resume feeding based on their own feelings and needs. Therefore, no randomization method was applied, and the allocation to study groups was based on each participant's autonomous decision. This approach was adopted to best reflect clinical reality and patient needs while respecting their individual rights and preferences.

**Data Collection and Variables Studied:** For each patient, a form was completed, including general data such as age, BMI, ASA classification, obstetric history, and reasons for the cesarean section. Several variables were collected to assess the safety of early feeding, including:

1. Time of resumption of feeding: The moment when patients resumed eating after the cesarean section, measured in hours.

2. Time of gas passage: The moment when patients resumed passing intestinal gas, also measured in hours.
3. Time of bowel movement: The moment when patients had their first bowel movement, expressed in days.
4. Postoperative Nausea and Vomiting (PONV): The occurrence of nausea and vomiting after the cesarean section, assessed as a binary variable (presence/absence).
5. Patient Satisfaction: Patient satisfaction was evaluated using a multiple-choice scale with response options of 'satisfied,' 'neutral,' or 'unsatisfied.' This evaluation reflects the overall perception of patients regarding their post-cesarean experience.

**Data Analysis:** Nominal variables were expressed in numbers and percentages (%). Continuous variables were described using the mean  $\pm$  standard deviation. Significant differences between groups were assessed using appropriate statistical tests, such as the two-sample t-test for age and the Mann-Whitney test for BMI. Qualitative variables were analyzed using the chi-squared test or Fisher's test depending on the conditions. All p-values were reported with a precision of three decimals. Statistical analyses were conducted using IBM SPSS Statistics for Windows, version 23. The statistical results were integrated into the text.

**Ethics and Informed Consent:** This study was approved by our institution's ethics committee, and all patients provided informed consent to participate in the research.

## RESULTS

### General Characteristics of Patients

Table 1 summarizes the general characteristics of the patients divided into two groups based on the time of resuming food intake after cesarean section. Group 1 (feeding < H3) included 91 patients, while Group 2 (feeding > H3) had 66 patients. The results show that both groups were comparable in terms of age ( $33.9 \pm 5.3$  vs.  $34.83 \pm 5.167$ ,  $p = 0.305$ ) and BMI ( $30.5 \pm 4.8$  vs.  $30.1 \pm 3.9$ ,  $p = 0.586$ ). The distribution of ASA (American Society of Anesthesiologists) classes was also similar between the groups ( $p = 0.083$ ). Obstetric history, including parity, previous cesarean sections, and gravidity, were comparable between the two groups. Additionally, the reasons for the cesarean section, whether they were repeat cesareans or related to maternal, obstetric, or fetal causes, showed no significant differences between the groups ( $p = 0.923$ ).

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Table 1. General Characteristics of Patients

General Characteristics of Patients	Group 1 < H3 (n=91)	Group 2 > H3 (n=66)	P
Age (Years)	33,9+/-5,3	34,83+/-5,167	0,305
BMI	30,5+/-4,8	30,1+/-3,9	0,586
ASA Class			0,083
<b>ASA I</b>	26(28,6)	16(24,2)	
<b>ASA II</b>	65(71,4)	50(75,8)	
<b>Obstetric History</b>			
<b>Parity</b>	1(1-3)	1(1-3)	0,677
<b>Previous Cesarean Sections</b>	2(1-3)	2(1-4)	0,709
<b>Gravidity</b>	3(2-8)	3(2-7)	0,796
<b>Reasons for Cesarean Section</b>			0,923
<b>Repeat Cesarean or More</b>	62(68,1)	45(68,2)	
<b>Maternal Causes</b>	2(2,2)	2(3)	
<b>Obstetric Causes</b>	18(19,8)	11(16,7)	
<b>Fetal Causes</b>	9(9,9)	8(12,1)	

Age and BMI are expressed as mean ± standard deviation, while ASA class, obstetric history, and reasons for cesarean section are presented in frequency (percentage).

Age was subjected to an independent samples t-test, and BMI was assessed using the Mann-Whitney test. Qualitative variables were analyzed using the chi-square ( $\chi^2$ ) test or Fisher's test based on the specific study conditions.

## Relationship between Resumption of Food Intake, Intestinal Transit, and Postoperative Nausea and Vomiting (PONV)

Table 2 presents the results regarding the relationship between the timing of food resumption, the restoration of intestinal transit, postoperative nausea and vomiting (PONV), and patient satisfaction.

- **Food Intake (H):** The time of food resumption after cesarean section was significantly shorter in Group 1 ( $2.0 \pm 0.00$  hours) compared to Group 2 ( $4.25 \pm 3.048$  hours) ( $p < 0.001$ ).

- **Gas Resumption (H):** Group 1 showed a faster resumption of gas ( $14.24 \pm 8.21$  hours) compared to Group 2 ( $20.44 \pm 9.74$  hours) ( $p < 0.001$ ).
- **Stool Resumption (D):** Although the time of stool resumption did not show a statistically significant difference between the two groups, Group 1 had a trend towards slightly earlier resumption ( $2.60 \pm 0.897$  days) compared to Group 2 ( $2.85 \pm 0.989$  days) ( $p = 0.069$ ).
- **PONV:** No significant difference was observed in the incidence of PONV between the two groups (26.7% vs. 26.9%,  $p = 0.973$ ).
- **Satisfaction:** Patient satisfaction, assessed on a multiple-choice scale, was high in both groups, with no significant difference (96.8% vs. 100%,  $p = 0.235$ ).

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**Table 2. Relationship Between Food Resumption, Intestinal Transit, and Postoperative Nausea and Vomiting (PONV)**

	Food Intake < H3	Food Intake > H3	P
Food Intake (Hours)	2.0 ± 0.00	4.25 ± 3.048	<0.001
Gas Resumption (Hours)	14.24 ± 8.21	20.44 ± 9.74	<0.001
Stool Resumption (Days)	2.60 ± 0.897	2.85 ± 0.989	0.069
PONV	26 (26.7%)	27 (26.9%)	0.973
Satisfaction	90 (96.8%)	43 (100%)	0.235

The Mann-Whitney test for quantitative variables, chi-square ( $\chi^2$ ) test for NVPO, and satisfaction.

## DISCUSSION

In our study, we explored the impact of early resumption of food intake after a cesarean section on the recovery of intestinal transit, nausea, vomiting, and patient satisfaction. Unlike the conventional practice at our maternity, which mandated a six-hour delay before allowing patients to drink or consume a light meal after the return of transit, we permitted our patients to drink one hour after the procedure and consume a light meal as early as the second postoperative hour, provided there were no foreseeable complications. Subsequently, we compared two groups of patients: those who resumed food intake before the third hour and those who did so after this period.

Our findings indicated that early resumption of food intake did not result in a significant increase in nausea, vomiting, or other gastrointestinal complications, as there were no significant differences observed between the two groups. However, a notable improvement in the recovery of intestinal gas transit was observed in the group that resumed food intake earlier ( $p < 0.001$ ). Furthermore, patient satisfaction was similar regardless of the timing of food resumption ( $p = 0.235$ ).

Our findings are consistent with those of the study conducted by Yu-Yun Hsu et al., which examined the impact of early resumption of food intake after a cesarean section on gastrointestinal outcomes. Hsu's study collected 17 studies published between 1980 and 2011 and demonstrated that early food intake promoted the recovery of gastrointestinal functions, significantly reducing the time required for the return of bowel sounds, the passage of gas, and the evacuation of stools. Moreover, their research showed that early resumption of food intake did not result in a significant increase in gastrointestinal complications [3].

Our results, therefore, strengthen the notion that early resumption of food intake after a cesarean section can enhance the recovery of intestinal transit without increasing the risk of gastrointestinal complications. This approach can be considered a safe and beneficial option for cesarean section patients, improving their postoperative comfort while maintaining their safety.

Other studies have also supported this approach. In 1991, Guedj et al. demonstrated that immediate oral rehydration after a cesarean section did not lead to more side effects (nausea, vomiting, complications) and had no negative effects on peristalsis [3]. More recent studies have also shown that early refeeding significantly improves transit recovery. For instance, Soriano et al., in a study involving 221 patients, found that patients who received early nutrition (liquid from the 2nd hour and solid from the 6th postoperative hour) regained their bowel sounds more quickly [4].

In 2002, Benhamou et al. confirmed these results and showed that early food intake after a cesarean section had no adverse gastrointestinal effects. Furthermore, it reduced feelings of hunger and thirst without side effects while increasing maternal satisfaction [5].

An even faster approach to refeeding was proposed by Teoh et al. in a randomized controlled trial involving 196 patients. They received clear fluids from the 30th minute postoperatively, supplemented with solid food from the 2nd postoperative hour, compared to no solid or liquid food before the 2nd hour. The authors demonstrated that early nutrition after a cesarean section under spinal anesthesia did not lead to an increase in ileus. Moreover, it offered additional benefits, including earlier removal of the intravenous infusion and greater maternal satisfaction in the group receiving early nutrition [5].

Other studies conducted in Turkey by Mulayin et al. [6] and in Argentina by Izbizky et al. [7] also showed good tolerance of early solid food intake after a cesarean section, using respective intervals of two hours and four hours for solid food resumption.

However, it is important to note that postoperative nausea and vomiting (PONV) remain a common and distressing complication during cesarean section. Their incidence can vary from 21% to 79% [8, 9, 10, 11, 12, 13]. The etiology of PONV is not clearly defined, but several factors, including the elevated level of progesterone during pregnancy, post-spinal anesthesia hypotension, and the use of intraspinal morphine, may contribute to their occurrence [14].

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According to M. Balki and A. Carvalho, during a cesarean section under spinal anesthesia, PONV prevention through hypotension control, optimizing neuraxial morphine use, minimizing surgical stimuli, and judicious administration of oxytocin appears to be more effective than prophylactic treatment with antiemetics [14].

In our study, PONV prevention was achieved using dexamethasone intraoperatively and ondansetron postoperatively. Furthermore, we systematically prevented intraoperative hypotension through vascular filling and ephedrine administration. Despite these preventive measures, 27.6% of patients experienced varying degrees of PONV in the perioperative and postoperative periods, requiring ondansetron treatment.

A study conducted by Akpan Imeh in 2014 showed that the combination of dexamethasone and ondansetron was more effective than dexamethasone alone for PONV prevention after a cesarean section under spinal anesthesia [15].

According to the Enhanced Recovery After Surgery (ERAS) recommendations in 2019, managing hypotension reduces the incidence of perioperative and postoperative nausea and vomiting, with moderate-level evidence and a strong recommendation. Moreover, a multimodal approach should be applied to treat postoperative nausea and vomiting, with moderate-level evidence and a strong recommendation [8].

In conclusion, this study has explored the safety and implications of early resumption of feeding following cesarean sections performed under spinal anesthesia. Our findings indicate that early food intake, initiated as soon as one hour post-surgery, did not lead to a significant increase in gastrointestinal complications or postoperative nausea and vomiting. Moreover, the faster recovery of intestinal transit observed in patients who resumed food intake early suggests a potential benefit.

A notable strength of our approach is the patient-centered model, which respects individual preferences, enhancing the clinical relevance of the results and acknowledging the importance of personalized care.

While this study sheds light on the safety and advantages of early resumption of feeding, further research with larger samples and longer-term follow-ups is warranted. The patient's well-being is at the forefront, and optimizing post-cesarean care is essential for both maternal and neonatal health.

### LIMITATIONS

This study has certain limitations that should be acknowledged. Firstly, the sample size is relatively small, which may limit the generalizability of the results to a larger population. It is important to recognize that in larger samples, trends or significant differences may emerge. Additionally, the lack of randomization in the allocation of patients may introduce a potential selection bias, thus affecting the representativeness of the study participants.

### STRENGTHS

However, a major strength of this study lies in its patient-centered approach. By allowing patients to individually decide when to resume food intake based on their comfort and needs, the study reflects a respectful approach to patient preferences. This approach enhances the clinical relevance of the results by acknowledging the diversity of patients' experiences and needs. Emphasizing patient satisfaction and care personalization, this approach can contribute to the improvement of the quality of post-cesarean care.

### DECLARATION OF COMPETING INTEREST

All authors declare no conflict of interest.

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