Original Article

Early versus Late Initiation of Oral Feeding after Cesarean Section

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Abstract

Background: *In cesarean delivery patients there has been an ongoing debate about the optimal timing for introducing oral intake. Few recent studies have demonstrated that, after cesarean delivery early oral feeding of patients is well-tolerated and is associated with a more rapid return to a normal diet. The aim of the study was to evaluate the safety of early oral feeding after uncomplicated cesarean delivery.* ***Materials and Methods:*** *It is a Randomized controlled trial (RCT) conducted in Department of Obstetrics and Gynecology, ICMH, Matuail, Dhaka from December 2011 to November 2012 over 172 pregnant women aged 20-40 years old. Pregnant women with term singleton pregnancy, uncomplicated cesarean section (CS) and cesarean section under spinal anesthesia were purposively selected as study population. Data were collected from face to face interview of the patient and recorded in a data collection sheet. Statistical analysis performed with SPSS (version 12) software for windows.* ***Results:*** *Among 172 study subjects, in group A 7(8.9%) and in group B 5(5.4%) developed mild ileus symptoms, which was not statistically significant ($p > 0.1$). Mean(±SD) of time interval of recovery of bowel sound after CS in group A was 7.86(±1.18) hours and in group B was 18.04(±2.84) hours which was statistically highly significant ($p < 0.001$). The mean(±SD) time interval between passing of stool and CS in group A was 20.25(±6.25) hours and in group B was 57.67(±4.21) hours which was statistically highly significant ($p < 0.001$).* ***Conclusion:*** *Early initiation of oral feeding after uncomplicated CS under spinal anesthesia did not increase the risk of gastrointestinal symptoms or paralytic ileus. In fact, it led to better outcomes and better patient satisfaction.*

Keywords: Caesarean section, Early oral feeding, Delayed oral feeding, Post-operative ileus, Bowel function.

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Introduction

Cesarean section (CS) is the most common major surgical procedure performed in gynecology and obstetrics department. In the industrialized world, it accounts for more than one-fourth of all deliveries in the USA in 2003 and 21% of all deliveries in England.[1] Post-cesarean section patient feeding practices vary considerably between institutions and individual practitioners, ranging from early oral fluids or food to delayed introduction of oral fluids and food which may be after 24 hours or more. The practice of allowing early oral fluids or food after cesarean section is often based on the assumption that the bowels are not usually exposed or handled during CS and therefore bowel function may not get disturbed. It has been suggested that, even following bowel surgery, bowel sounds change in character but bowel function continues uninterrupted. Studies have suggested that perioperative nutritional status is of more important to wound healing than overall nutritional status. In spite of these reports, the tradition of withholding or delaying the intake of fluids immediately postoperatively has been practiced without supportive evidence.[2] Traditionally, women who had a cesarean section had solid food withheld for the first 24 hours in the belief that this would prevent gastrointestinal complications.[1] Patients are usually given a graduated dietary regimen after cesarean delivery to decrease the likelihood of developing postoperative ileus.[3] Postoperative ileus (POI) is a common and clinically important problem occurring after surgical procedures that may contribute to significant postoperative morbidity, including delaying enteral nutrition, patient discomfort, prolonging hospitalization, increased postoperative pain, poor wound healing, increased risk of other postopera-

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tive complications such as pneumonia, pulmonary embolism, atelectasis, other nosocomial infections and increased health care cost.[4] A number of factors may influence the decision regarding early or delayed initiation of fluids and food. These include the type of abdominal incision, whether the peritoneum is closed, the extent of bowel irritation, and the use of additional operative procedures during CS. Low midline skin incision, swab packing during operation or cleaning amniotic fluid or blood in the abdominal cavity and closure of the peritoneum may also reflect the return of bowel function. All these factors need to be considered when determining the applicability of the findings of the trials on 'early' versus 'delayed' initiation of fluids and solid food .[2] Therefore, few recent studies have demonstrated that, after cesarean delivery early oral feeding of patients is well-tolerated and is associated with a more rapid return to a normal diet. Despite studies showing the feasibility of early oral feeding, many institutions still remain reluctant to modify their own practice. Patients are allowed to drink clear liquids only after return of bowel sounds and eat semisolids if flatus has passed.[3] Moreover, food and fluids be withheld on the day of the operation. Clear fluids can be offered the next day, thereafter full fluids and then a regular diet can be commenced. Alternatively, clear hot liquids can be given to women as early as one and a half hours after general anesthesia or immediately after cesarean section if a regional block was used. If these fluids are tolerated without difficulty, a regular diet may be offered at the next feeding if the patient desires it. Evidence shows patients who were fed 6-8 hours after cesarean deliveries had a shorter time interval from surgery to bowel movement, a short duration of intravenous fluid infusion and short hospital stays. Most of these studies had many confounding factors such as emergency cases, adhesions, blood losses, operative findings, and extended operative time.[5]

Opponents of early oral food or fluids argue that cesarean section is a major operation with a risk of complications arising from giving oral fluids or food soon after surgery. Abdominal surgery abolishes normal bowel motility immediately post operatively and the onset of bowel function is influenced by the type of surgery performed and that there may be many factors contributing to paralytic ileus (decreased or absence of intestinal peristalsis following abdominal surgery characterized by abdominal tenderness and distension, absence of bowel sounds, lack of flatus and by nausea and vomiting) other than early feeding, such as neural and hormonal factors, involvement of the sympathetic and the parasympathetic nervous system, use of narcotics and the type of anesthetic agents used.[2] After gastrointestinal surgery, traditional care regimens have usually included restricted oral intake to prevent signs of postoperative ileus and to protect the surgical anastomoses. When postoperative ileus develops, it is usually of short duration. Therefore, feeding within 24 hours after laparotomy is tolerated, and the feed is absorbed. The other rationale for withholding food or feeding orally is to allow anastomoses time to heal before being stressed by food. In addition, starvation changes the body's metabolism within 24 hours by increasing insulin resistance and reducing muscle function. Several studies suggested that after surgery, optimal nutritional status and maintenance of bowel function contribute significantly to wound healing. Early oral intake has also been suggested to reduce sepsis risk because of decreased bacterial colonization and decreased translocation through defects on the bowel mucosa into the blood circulation.[6] Some researchers stated that, food after cesarean section must not be allowed until bowel sounds are heard, as the woman is at risk of developing paralytic ileus due to handling of the bowel and fluids should be gradually introduced followed by light diet. So, the first 12 to 24 hours, food and fluids should be withheld. After this period, graded oral fluids can be given until full fluids are tolerated at about the second day postoperatively. It is only when bowel sounds are heard and flatus

is passed that regular diet can be allowed on about the third postoperative day.[2] Recently, the practice of delayed postoperative oral intake has been challenged by evidence from several gastrointestinal physiologic studies that examine contractile activity of the intestine. Gastric emptying and small intestinal absorptive capacity resume on the first postoperative day although colonic activity normally return within 48 hours after surgery. These data have suggested that the concept of postoperative ileus as paralysis of the entire bowel with complete absence of any functional contractile activity is misleading.[7] If postoperative ileus takes place, it is usually transient and not significant clinically. Also, it is known that typically the stomach and pancreas secrete one to two liters of fluid daily which is readily absorbed in the small intestine. Therefore, postoperative patients without a nasogastric tube are in fact tolerating high volumes of fluid even nothing is given orally. There are studies demonstrating that physical signs suggestive of resolution of postoperative ileus are not well correlated with the incidence of nausea and vomiting. Based on these findings, the concept of withholding oral intake until resolution of postoperative ileus does not seem to be reasonable. Cost saving, which appears to be an important issue in many countries or health care systems, is another potential advantage of early feeding scheme as the patients in this group tend to have a shorter length of hospital stay. Currently, there is an ongoing Cochrane systematic review on early enteral nutrition after colorectal surgery to determine whether there is evidence that early enteral nutrition following colorectal surgery is of clinical benefit.[7] A systematic review in patients undergoing cesarean delivery have shown that early oral intake is safe without any significant increase in complications.[2] Early initiation of oral feeding after CS is well tolerated by patients and cost effective, but is not yet practiced in most institutions. There is some evidence that early oral feeding after CS under spinal anesthesia has got several advantages. So, the aim of this study was to evaluate the safety of early postoperative oral feeding versus conventional delayed feeding for patients undergoing uncomplicated CS.

Materials and Methods

It is a Randomized controlled trial (RCT) conducted in Department of Obstetrics and Gynecology, ICMH, Matuail, Dhaka from December 2011 to November 2012 over 172 pregnant women aged 20-40 years old. Pregnant women with term singleton pregnancy, uncomplicated CS and CS under spinal anesthesia were purposively selected as study population. Pregnant women having hypertension, diabetes mellitus, complicated pregnancy were excluded from the study. After CS study population were divided into two groups as early feeding group (Group A; n = 79) and late feeding group (Group B; n = 93) by random sampling. All subjects had more than 6 hours of nothing per oral (NPO) time before surgery and underwent CS under spinal anesthesia. Women assigned to the early feeding started sips of water immediately after operation, followed by liquid at 2 hours, semi-solid at 4 hours and solid (rice, dal and fish) at 6 hours. Patients assigned in the delayed feeding started sips of water orally only after return of bowel sounds, approximately 24 hours after surgery, received a liquid diet for the next meal, followed by a soft diet for three subsequent meals and then solid food. Intravenous (i.v) fluids stopped when semisolid food tolerated well. In this study, it was acceptable if the patients ingested more than 75% of all offered food for one meal. The patients were examined thrice to observe nausea, vomiting, temperature, return of bowel sounds, and passage of flatus or stools. The following parameters were assessed and statistically compared between the two groups: patient profile, postoperative findings, symptoms and signs of mild to severe ileus, time to recovery of bowel sounds, passage of flatus, bowel movements, and febrile morbidity. The patients were allowed to be discharged from the hospital when they were able to tolerate a regular diet without

emesis, passed flatus or had a bowel movement, and demonstrated no febrile morbidity for at least 24 hours. In this study the time of onset of surgery was designated as 0 hour, the day of surgery was considered being the first 24 hours, second POD encompass hours 24-48 hours, third POD consisted of hours 48-72 , the operative time was defined as the time from the onset of the surgery to the completion of skin closure, the length of hospital stay was defined as the time interval between the onset of surgery to hospital discharge, mild ileus symptoms was included symptoms of anorexia, abdominal cramping, or non-persistent nausea and/or vomiting, severe ileus was defined as abdominal distention, greater than three episodes of vomiting in a 24-hour period, patients who required a nasogastric tube or abdominal radiographs and the inability to tolerate oral liquids and postoperative febrile morbidity was considered to be oral temperatures equal to or exceeding 100.4°F on two or more occasions, at least 6 hours apart, occurring greater than 24 hours after the surgery.

Data were collected from face to face interview of the patient and recorded in a data collection sheet. Statistical analysis performed with SPSS (version 12) software for windows. Comparison between both groups performed using the two-tailed student t-test for continuous variables, and the chi square test for categorical variables. Normally distributed data were reported by mean and standard deviation (SD), and means were compared by independent t-test. Throughout all analyses, $p < .05$ was considered statistically significant. The ethical committee of the Institute of Child and Mother Health (ICMH), Matuail, Dhaka, approved the study. Written informed consent was obtained from all participants.

Results

Among 172 women most (79.9% and 63.4%) were in 21-30 years age group where group A (79.7%) had mean(±SD) age 23.8(±3.34) years and group B (63.4%) had mean(±SD) 24.05(±4.59); exhibits in Table I. Table II shows previous cesarean section was the most common indication (32.9% and 37.6% in Group A & B respectively) followed by fetal distress (24.1% and 18.3%).

Table III shows that early initiation of oral feeding after cesarean section in group A developed mild ileus symptoms in 7(8.9%) patients and late initiation of oral feeding developed mild ileus symptoms in 5(5.4%) patients which was not significant statistically ($p > 0.10$).

Table IV shows the time interval between recoveries of bowel sound after cesarean section. Mean(±SD) time interval of recovery of bowel sound after cesarean section in group A was 7.86(±1.18) hours and in group B was 18.04(±2.84) hours which was statistically highly significant ($p < 0.001$).

Table V shows that the mean(±SD) time interval between passing of stool and cesarean section in group A was 20.25(±6.25) hours and in group B was 57.67(±4.21) hours which was also statistically highly significant ($p < 0.001$).

Table I: Distribution of study population by age group (*n*=172)

Age group (years)	Group A(*n*=79)	Group B(*n*=93)	*p*
	n (%)		
<20	16 (20.3)	26 (28.0)	
21-30	63 (79.7)	59 (63.4)	
31-40	0	8 (8.6)	
Mean(±SD) years	23.80(±3.38)	24.05(±4.59)	>0.50
Range (years)	18.0-30.0	18.0-36.0	

p, sig. 2-tailed; $p < 0.05$ = statistically significant

Table II: Indications for cesarean section (*n*=172)

Indications	Group A (*n* = 79)	Group B (*n*= 93)
	n (%)	
Previous cesarean section	26 (32.9)	35 (37.6)
Failure to progress	18 (22.8)	6 (6.5)
Fetal distress	19 (24.1)	17 (18.3)
Cephalopelvic disproportion	7 (8.9)	3 (3.2)
Malpresentation	4 (5.1)	11 (11.8)
Unfavorable cervix	1 (1.3)	0 (0)
Others	4 (5.1)	21 (22.6)

Table III: Distribution of study population by appearance of postoperative ileus symptom (*n* =172)			
Variables	**Group A(*n* =79)**	**Group B(*n* =93)**	***p***
	***n* (%)**		
Ileus symptom absent	72 (91.1)	88 (94.6)	> 0.10
Mild Ileus symptom	7 (8.9)	5 (5.4)	
p, sig. 2-tailed; $p < 0.05$ = statistically significant			

Table IV: Time interval between recovery of bowel sound and cesarean section (*n* =172)			
Time interval (hours)	**Group A(*n* =79)**	**Group B(*n* =93)**	***p***
	n (%)		
≤6	6 (7.6)	0	< 0.001
7-12	73(92.4)	0	
13-18	0	74(79.6)	
19-24	0	19(20.4)	
Mean (±SD) hours	7.86±1.18	18.04±2.84	
Range (hours)	3.0-12.0	14.0-24.0	
p, sig. 2-tailed; $p < 0.05$ = statistically significant			

Table V: Time interval between passing of stool and cesarean section (*n* =172)			
Time interval (Hours)	**Group A (*n* =79)**	**Group B (*n* =93)**	***p***
	***n* (%)**		
<20	43(54.4)	0	< 0.001
21-40	36(45.6)	1	
41-60	0	84(90.3)	
60-80	0	8(8.6)	
Mean(±SD)	20.25±6.25	57.67±4.21	
Range	8.0-36.0	28.0-68.0	
p, sig. 2-tailed; $p < 0.05$ = statistically significant			

Discussion

Following cesarean section (CS), the traditional practice is to withhold oral feeding until resolution of postoperative ileus (POI), often defined by passage of flatus and/or a bowel movement, with a physician-dictated regimen of gradual expansion of enteral feeding. This has been based upon concern about the possibility that early enteral feeding could exaggerate postoperative ileus, a pervasive problematic condition that might to be minimized because of its possible serious consequences including significant postoperative morbidity, prolonged hospitalization and increase healthcare costs. The exact etiology of ileus is unknown, but it is believed to be more common after laparotomy and major abdominal surgical procedures that enter the peritoneal cavity, notably those involving the bowel. In fact many factors are believed to contribute to the perpetuation of postoperative ileus, including intraoperative bowel manipulation, anesthetic agents, perioperative narcotics and postoperative sympathetic hyperactivity.[8]

This study found that early initiation of oral feeding after cesarean section in group A developed mild ileus symptoms in 7 (8.9%) patients and late initiation of oral feeding (group B) developed mild ileus symptoms in 5 (5.4%) patients, which was not statistically significant. This study is consistent with the findings of Ali et al.[4]

There is widespread belief that intestinal stasis or paralytic ileus follows all abdominal surgery. The exact cause of this clinical phenomenon is unknown, but it has been proposed that stimulation of pain fibers, excessive sympathetic tone, and the release of inhibitory neurotransmitters from the gut wall are involved mechanisms.[9]

This study found that the mean(±SD) recovery time of bowel sounds in early oral feeding group was shorter: 7.86(±1.18) hours then delayed oral feeding group: 18.04(±2.84) hours which was statistically highly significant ($p < 0.001$). Similar result was found by Abd and Mehta et al. where patients experienced rapid return of propulsive bowel movements during early oral hydration after elective cesarean section. It also effectively maintained fluid balance, successful breast feeding, less side effects and shorter hospital stay than the conventional intravenous hydration.[10,3]

In this study, authors found short time interval between passing of stool and cesarean section in group A 20.25±6.25 hours (mean±SD) than group B 57.67±4.21 hours, which was statistically highly significant ($p < 0.001$). Yaghmaei et al. also found

similar result where the early feeding group had a shorter mean time to first flatus and higher satisfaction compared to the late postoperative feeding.[11] Kramer et al. also reported that early consumption of solid food in women was well tolerated, with no significantly increased gastrointestinal complications.[12] Moreover, Reissman et al. concluded that, the safety of early postoperative oral intake, evidence from general surgical studies and a systematic review in patients undergoing cesarean delivery is safe without any significant increase in complications.[13] Additionally, Maeboud KAE examined the effects of gum chewing after cesarean section where they found that, gum chewing stimulates early return of bowel motility and it might be associated with decreased tolerance to the first postoperative diet. As with early enteral feeding the authors found no difference in mild ileus symptoms, yet abdominal distension was less in gum chewing group. So, they conclude that gum chewing after cesarean section is safe, well tolerated, and associated with rapid resumption of intestinal motility and shorter hospital stay; This has a potential impact on reducing the overall healthcare costs in case of routine implementation.[8] On the contrary, Watters et al. reported that early feeding was associated with a high rate of intolerance and might even lead complications.[14]

Benhamou et al. 2002 showed that early feeding after cesarean delivery reduced the severity and incidence of distressing symptoms of hunger and thirst, thus improving overall satisfaction score, with no increased side-effects.[15] Kramer et al. conclude that routine early feeding of subjects undergoing cesarean delivery can be implemented without an increase in gastrointestinal symptoms or paralytic ileus.[12]

Several clinical trials and a systematic review have shown that early feeding is as safe as the traditional progressive approach. Moreover, some additional benefits have been reported such as a more rapid return of bowel sounds and regular oral diet.[14] It is suggested that the early feeding regimen be considered as it offers benefits to the patients such as less suffering from thirst, hunger, shorter hospital stay and save cost. However, the management of postoperative feeding is dependent on the patients' desire after they have been counseled about the detail of both regimens.[5]

Conflicts of interest: The authors declare no conflict of interest.

Conclusion

Early initiation of oral food, following uncomplicated cesarean section under regional anesthesia, is safe, beneficial, well tolerated and does not cause significant increase in postoperative ileus; produces a better outcome, compared to delayed initiation of feeding.

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