

# A Comparative Study of Early versus Conventional delay in Postoperative oral intake in Women undergoing Cesarean Section under regional anaesthesia

S. Suganya Devi<sup>1\*</sup>, Sheila K Pillai<sup>2</sup>, Jaya Vijayaraghavan<sup>3</sup>

<sup>1</sup>Post Graduate Student, <sup>2</sup>Associate Professor, <sup>3</sup>Professor,  
Sri Ramachandra Medical College and Research Institute, Porur, Chennai, Tamil Nadu – 600116

**\*Corresponding Author:**

E-mail: drsheilasunil@hotmail.com

## ABSTRACT

The rate of cesarean delivery is increasing around the world. A traditional graduated dietary regimen, “nothing by mouth” for 24 hours, or until the presence of bowel sounds or passing flatus is still practised after cesarean delivery. In recent studies, an early oral intake has been recommended instead of the traditional dietary regimen for women after cesarean delivery. Our study aims at comparing the safety and efficacy of early versus conventional post-operative oral intake in patients undergoing caesarean section under regional anaesthesia. It is a prospective comparative study involving 308 patients (153 in study group and 155 in the control group) with strict inclusion and exclusion criteria. The outcomes assessed included incidence of paralytic ileus, time interval for bowel movements to appear, duration of intravenous fluid administration and length of hospital stay. In our study none of the patients in the study group developed ileus and 6.44% in the control group had ileus. Women in the early feeding group had a more rapid return of bowel function, with a substantially shorter mean postoperative time interval to the first active bowel movement. The duration of intravenous fluid administration in the study group was lesser and was statistically significant. This study also confirmed that the early feeding regimen for patients after uncomplicated cesarean section was well tolerated. Also it offers other benefits to the patients such as less suffering from thirst and hunger, shorter hospital stay and reduced hospital expenses. Further studies with larger sample sizes may be needed to confirm the above observations with statistical significance.

**Keywords:** Early oral intake, Conventional oral intake.

## INTRODUCTION

After general abdominal surgery, it is customary for the patient to take no fluid or food by mouth for a specific period of time, or until the return of bowel function as evidenced by propulsive bowel sounds or the passing of flatus or stool. After caesarean section, 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. These discrepancies raise concern as to the bases of the different practices. ‘Standing orders’ may become accepted as part of everyday practice without their validity being questioned. The practice of allowing early oral fluids or food after caesarean section is often based on the assumption that the bowels are not usually exposed or handled during caesarean section, and one would therefore not expect bowel function to be disturbed.

The rate of cesarean delivery is increasing around the world, Cesarean delivery is an abdominal surgery, and postoperative care in hydration and nutrition is a main concern for women with abdominal surgery. A traditional graduated dietary regimen, “nothing by mouth” for 24 hours, or until the presence of bowel sounds or passing flatus is still performed after cesarean delivery.

The main purpose of the traditional dietary regimen is to prevent the occurrence of ileus after an abdominal surgery.<sup>1,2</sup> Recently, early oral intake has been recommended instead of the traditional dietary regimen for women after cesarean delivery. Concerns have been raised about the effect of early oral intake on postoperative ileus and other complications after cesarean delivery.<sup>2,3</sup> A meta-analysis in 2002 revealed no evidence to indicate that early oral intake after cesarean delivery increases the incidence of ileus or other postoperative complications. Early oral intake may improve gastrointestinal recovery after cesarean delivery.<sup>4</sup> A clinical guideline for cesarean delivery developed by the National Institute for Health and Clinical Excellence indicated that women can receive oral intake when they are recovering well without any complications.<sup>5</sup>

Our study aimed to compare the efficacy and side effects of early postoperative oral intake versus conventional oral intake for patients undergoing caesarean section under regional anaesthesia.

## MATERIALS AND METHODS

This was a prospective comparative study carried out at Sri Ramachandra Medical College and Research Institute, Chennai, Tamil Nadu. The study group comprised of early-fed women who were offered a liquid diet within 8 hours after surgery,

advanced to a soft diet on the next meal(14-16hrs) and then a regular diet. The control group comprised of conventionally fed women who were prohibited from mouth-feed for the first 16-24 hours after surgery. They received a liquid diet for the next meal followed by a soft solid diet and then a regular diet.

Women who underwent uncomplicated cesarean section under regional anesthesia, who were kept nil by mouth for more than 8 hours before surgery, with an operative time between 30-60 minutes were included in the study. Women who received general anesthesia, those with bleeding disorders, those who had intra operative bowel or omental adhesions, those with intra operative bowel or bladder injury, those who had estimated intraoperative blood loss of more than 1000 ml, those who received magnesium sulfate treatment and those with prolonged duration of surgery more than 60 minutes were excluded from the surgery.

The time of onset of surgery was designated as zero hour. The day of surgery (day 0) was considered to be the first 24 hours, the first postoperative day (day 1) encompassed the next 24-48 hours and the second post-operative day (day 2) covered the next 48-72 hours. The operative time was defined as the time from the onset of surgery to the completion of skin closure. The duration of intravenous fluid administration was defined as the time from the onset of surgery to the removal of intra- venous cannula. Intravenous fluid was stopped when patients were capable of consuming adequate liquid diet. The Foley's catheter was removed at the same time as intravenous cannula.

Time interval for bowel movements to appear was defined as the time from the onset of surgery until the first detection of active bowel sounds. Mild ileus symptoms included symptoms of anorexia, abdominal cramping, non-persistent nausea and vomiting as well as mild abdominal distension on physical examination.<sup>6</sup> Severe ileus symptoms were defined as marked abdominal distension with more than three episodes of vomiting in a 24-hour period or an inability to tolerate oral liquids and a need to delay the stepped up diet. Patients who required a nasogastric tube or abdominal radiography were also designated as having severe ileus symptoms.<sup>6</sup>

The length of hospital stay was counted from the day of surgery (day 0) to the day the patients were allowed to be discharged from the hospital and signed by the physician under the conditions that 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.<sup>6</sup> Postoperative febrile morbidity was considered to be an oral temperature equal to or exceeding 38°C or 100.4°F on 2 or more occasions, at least 6 hours apart, occurring greater than 24 hours

after the surgery. The patients were examined twice a day by our team.

## OBSERVATIONS AND RESULTS

The study was conducted to compare the efficacy and possible side effects of early postoperative feeding versus conventional feeding for patients undergoing cesarean section. Three hundred and nine patients who underwent uncomplicated cesarean section were studied. 153 women were in the early feeding regimen and 155 women were in the conventional feeding regimen. Women in both groups had similar demographic characteristics, including age, parity, gravidity, gestational age, time since nil by mouth before surgery, indications for caesarean section, operative findings, estimated blood loss, and mean duration of surgery.

**Table 1: Age Distribution**

| Age YEARS | Early feeding group (n=153) | Conventional feeding group(n=155) |
|-----------|-----------------------------|-----------------------------------|
| 20-30     | 113(73.8%)                  | 111(71.6%)                        |
| 30-40     | 40(26.2%)                   | 44(28.4%)                         |

In the study group,73.8% of women were between 20-30 years.26.2% of the women were between 30-40 years.In the control group,71.6% were between 20-30 years and 28.2% were between30-40 years.

**Table 2: Parity Distribution**

| Parity       | Early feeding group N=153 | Conventional Feeding Group N=155 |
|--------------|---------------------------|----------------------------------|
| Primigravida | 49(32.02%)                | 66(42.58%)                       |
| Multigravida | 106(69.28%)               | 89(57.42%)                       |

In our study, out of 153 women in early feeding group, 32.02% were primi gravida and 69.28% were multigravida. In the conventional feeding group, 42.58% were primigravida and 57.42% were multi gravida.

**Table 3: Gestational Age Distribution**

| Variables      | Group      | N   | Mean  | Std. Deviation | P value |
|----------------|------------|-----|-------|----------------|---------|
| Gest age (wks) | Delayed    | 155 | 37.88 | 1.331          | 0.386   |
|                | Early feed | 153 | 37.70 | 1.617          |         |

In the early feeding group the mean gestational age was 37.70 weeks with the standard deviation of 1.617. In the conventional feeding group, the mean gestational age was 37.88weeks with the standard deviation of 1.331.

**Table 4: Surgery Related Characteristics**

| Characteristics                       | Early feeding group (N=153) | Delayed feeding group (N=155) | p value |
|---------------------------------------|-----------------------------|-------------------------------|---------|
| Preoperative Nil By Mouth time(hours) | 9.96±1.385                  | 9.98±1.331                    | 0.649   |
| Duration of surgery(min)              | 50.26±8.91                  | 48.98±8.03                    | 0.231   |
| Estimated blood loss(ml)              | 322.8±85.26                 | 324.5±92.29                   | 0.875   |

Women in both the groups had similar pre-operative Nil by Mouth time, duration of surgery and estimated blood loss.

**Table 5: Time Interval to Start of Diet**

| Variables                                     | Early feeding group (N=153) | Delayed feeding group (N=155) | p-value |
|---|-----------------------------|-------------------------------|---------|
| Time interval to start of liquid diet (hours) | 6.89±0.81                   | 21.26±2.1                     | <0.001  |
| Time interval to start of soft diet (hours)   | 15.09±1.003                 | 33.03±6.15                    | <0.001  |

The early feeding group was given a liquid diet soon after surgery (6.89 hours +/-0.81 hours). The conventional feeding group had liquid diet at 21.26 hours +/-2.1 hours). Also the early feeding group had soft diet after 15.09 hours+/-1.003 hours versus 33.03 hours +/- 6.15 hours for the conventionally fed group.

**Outcome of the study was assessed based on:**

- Symptoms and signs of mild and severe ileus
- Duration of intravenous fluid administration
- Post-operative time interval for bowel movements to appear
- Length of hospital stay.

**Table 6: Grade of Post Operative Ileus**

| Ileus  | Group        |      |            |     |
|--------|--------------|------|------------|-----|
|        | Delayed feed |      | Early feed |     |
|        | N=155        | %    | N=153      | %   |
| Mild   | 9            | 5.8  | 0          | 0.0 |
| Severe | 1            | 0.64 | 0          | 0.0 |

| Chi-Square Tests    | P-Value      |
|---------------------|--------------|
| Fisher's Exact Test | <b>0.014</b> |

In our study, mild ileus symptoms occurred in 9 (5.8%) conventionally fed patients. None of the patients in the early feeding group had ileus symptoms. All patients who developed mild ileus had spontaneously resolution of symptoms. One patient

in the conventional feeding group(0.64%) who had severe ileus symptoms, marked abdominal distension and the stepped up diet was delayed. After supportive treatment, the patient improved within 3 days.

**Table 7: Duration of Intravenous Fluids**

| Variables             | Group                      | Mean  | Std. Deviation | P value |
|-----------------------|----------------------------|-------|----------------|---------|
| Duration of IVF (hrs) | Early feeding N=153        | 23.4  | 2.97           | <0.001  |
|                       | Conventional feeding N=155 | 40.39 | 4.78           |         |

In our study, women in the early feeding group had significantly lesser mean duration of intravenous fluid administration of 23.4 hours +/-2.97 hours compared to the conventionally fed women with mean of 40.39 hours +/- 4.78 hours. The mean duration of intravenous fluid administration was found to be lesser in early fed group, due to shorter postoperative time interval to start liquid diet (p value< 0001).This is statistically significant. The duration of intravenous fluid administration was longer than necessary in this study as it was typically continued after the first meal through the night time to prevent possible dehydration.

**Table 8: Time Interval for Bowel Movements to Appear**

| Variables                               | Group                   | Mean  | Std. Deviation | P value |
|---|-------------------------|-------|----------------|---------|
| Time interval to bowel movement (hours) | Early feed N=153        | 6.97  | 0.71           | <0.001  |
|   | Conventional feed N=155 | 14.96 | 4.97           |         |

In our study, women in the early feeding group had significantly shorter time interval to first noticed bowel movement after surgery of 6.97 hours +/- 0.71 hours compared with the conventionally fed women with 14.96 hours +/- 4.97 hours. (P value <0.001). This is statistically significant.

**Table 9: Length of Hospital Stay**

| Variables            | Group                      | Mean | Std. Deviation | P value |
|----------------------|----------------------------|------|----------------|---------|
| Hospital Stay (days) | Early feeding N=153        | 4.66 | 0.827          | <0.001  |
|                      | Conventional feeding N=155 | 6.68 | 1.04           |         |

The length of hospital stay was found to be significantly shorter in early feeding group of 4.66

days +/- 0.827 days compared to conventionally fed women with 6.68 days +/- 1.04 days. (p value <0.001). This is statistically significant.

## **DISCUSSION**

### **Incidence of Paralytic Ileus**

In this study, we compared the outcomes of early and conventional oral feeding after cesarean sections done under regional anaesthesia. Traditionally obstetricians routinely withhold oral feeding during the postoperative period until there is resolution of the postoperative ileus, demonstrated by passage of flatus. Recent studies have demonstrated that early initiation of oral feeding is well tolerated and also beneficial to the patients.<sup>6,7,8,9</sup> Most of these studies were conducted in well-equipped specialised hospitals and majority of Caesarean sections were performed under general anaesthesia.

Chantarasorn et al<sup>10</sup> in his study observed that the rate of mild ileus symptoms in the early feeding group was significantly less than the conventional group (19.6% versus 31.1%, p value <0.03). In our study, those in the early feeding group did not have ileus symptoms whereas 6.45% of women in the conventional group had mild ileus symptoms which was statistically significant. In their study midline skin incisions were routinely used and those with intraoperative adhesions were not excluded. In this study all patients had low transverse skin incisions and those with intrauterine adhesions were excluded. This could account for the difference in the findings.

Adupa et al<sup>11</sup> in his study of 192 women who underwent cesarean section under both regional and general anaesthesia observed the effect of time of initiation of oral feeding on patient acceptability and also the benefits on gastrointestinal functions. The early feeding group were encouraged to take sips of water within six to eight hours followed by oral soup or milk at least 150 ml at a time within eight to twelve hours post-operative under supervision. The routine group had oral sips of water administered 24 to 48 hours postoperative. There was no significant difference in the incidence of paralytic ileus symptoms among the early and conventional feeding groups (15.6% versus 29.5%). The incidence of ileus symptoms was lesser in our study which had 0% versus 6.44% among the two groups. This could be due to the strict inclusion and exclusion criteria that we followed.

Izbizky et al<sup>12</sup> in a similar study of 200 women who underwent cesarean section under regional anaesthesia, evaluated the effect of early versus delayed feeding on patient satisfaction. The incidence of ileus which was considered as a secondary outcome in this study was 17% versus 16% among the early and delayed feeding groups.

Jalalian et al<sup>13</sup> compared the postoperative outcomes associated with early oral feeding (liquid diet two hours after surgery) versus late oral feeding (liquid diet eight hours after surgery) in 140 women who underwent elective cesarean section under regional anaesthesia. There were no significant differences between the two groups in the postoperative gastrointestinal complications. A study by Kovavisarath et al<sup>14</sup> compared the possible adverse gastrointestinal effects after cesarean section in 151 women who took their first meal early compared with those whose first meal was delayed (8 hours versus 24 hours). There were no significant demographic differences between the two groups. It was observed that there were no significant differences in postoperative gastrointestinal complications among the two groups. Similarly our study also showed that early oral feeding after cesarean delivery (8 hours) caused no significant adverse gastrointestinal effects compared with delayed oral feeding (24 hours).

A randomised controlled trial of early initiation of oral feeding after cesarean section by Orji et al<sup>15</sup> evaluated the safety and efficacy of early oral feeding after cesarean delivery under general and regional anaesthesia in 200 women. In this trial, women in the early feeding group were encouraged to take sips of water 8 hours post-operatively, followed by 100 ml oral tea at the time of supervision. Women in the routine feeding group were managed by restricting oral intake for the first 24 hours and administration of sips of water 24-48 hours post-operatively. The incidence of paralytic ileus symptoms was not significantly different among the two groups (15% versus 13%). In our study this was 0% versus 6.44% and only women who had caesarean section under regional anaesthesia were included in our study. Table 10 compares the incidence of ileus symptoms among the various studies.

### **Time Interval for Bowel Movements to Appear**

Sellers 1993<sup>16</sup> recommended withholding of fluids and food for the first 12-24 hours after caesarean section. This was followed by graded oral fluids until full fluids were tolerated at about the second postoperative day. Regular diet could be allowed after flatus was passed on about the postoperative day. Sweet 1997<sup>17</sup> suggested that fluids could be allowed soon after the surgery and a light diet started when the woman feels ready to eat. Only when the surgeon requests that food be withheld until bowel sounds are heard, should the woman be considered for delayed feeding.

In our study, the mean time interval to first noticed bowel movement after surgery was compared among the early fed and the conventionally fed groups (6.97 +/- 0.71 hours versus 14.96 +/- 4.97

hours, p value <0.001). Table 11 compares the time interval to the first noticed bowel movement between the early feeding and conventional feeding groups among the various other similar studies. All these studies demonstrate that women with early initiation of oral feeding had more rapid return of their bowel function after surgery with significant shorter mean post-operative time intervals to first noticed bowel sounds and first bowel movements.

#### **Duration of Intravenous Fluid Administration**

In the present study, women in the early feeding group had mean duration of intravenous fluid administration of 23.4 hours with a standard deviation of 2.97 hours compared to the conventionally fed women with mean duration of 40.39 hours with a standard deviation of 4.78 hours (p value <0.05). This was statistically significant. This is due to the shorter postoperative time interval to the starting of liquid diet in the early feeding group. Table 12 compares the above parameter among the similar studies available.

#### **Length of Hospital Stay**

Cesarean section is the most common surgical procedure for women with an increasing rate around the world. Reduction of incidence of complications and length of hospital stay have always been evaluated. Early feeding reduced the rate of body protein depletion and also improved wound healing. It reduced the length of hospital stay, the incidence of nosocomial infections and the treatment costs.<sup>18</sup> The women who were fed early, made more rapid recovery and expressed their interest in earlier hospital discharge. This could probably have been because of the adequate rehydration and improved early calorie intake. In our study, the length of hospital stay was found to be significantly lesser in early feeding group compared to the conventionally fed group. (4.66 days versus 6.68 days, p value <0.001). Table 13 shows the average length of hospital stay in similar studies. Early feeding led to more rapid return of bowel function, early ability to ambulate and early initiation of regular diet. Early feeding has the added benefits of earlier intravenous cannulae removal and breastfeeding initiation with potential for shorter hospitalisation.

Mangesi et al<sup>4</sup> conducted a systematic review to assess the effects of early versus delayed introduction of oral fluids or food or both, following caesarean section. They concluded that there was no evidence from the limited randomised trials

reviewed, to justify a policy of withholding oral fluids after uncomplicated caesarean section but further research is justified.

A systematic review and meta-analysis by Hsu et al<sup>18</sup> also indicated that early oral intake significantly reduced the time to return of bowel sounds and did not have a significant effect on postoperative vomiting. Also it showed that early oral intake improved significantly the passage of flatus and bowel evacuation. Early feeding after caesarean section is safe and is cited as an effective strategy to prevent postoperative ileus.<sup>3,19</sup> This could be due to stimulation of cephalic-vagal response, stimulation of gastrointestinal hormones (nitric oxide, vasoactive intestinal peptide and substance P) and direct topical stimulation. The best time to initiate oral intake after caesarean section is still unknown.<sup>19</sup> Current guidelines state that women can be fed as soon as oral intake is tolerated.<sup>1,5</sup> Hsu et al's systematic review showed that majority of the early feeding was provided within six to eight hours after caesarean delivery<sup>18</sup>. The mechanism of postoperative ileus has been noted to be a neurogenic non adrenergic pathway activated through splanchnic nerve during abdominal surgery and until three hours after surgery.<sup>3</sup> To avoid stimulating the splanchnic nerve, oral intake between six to eight hours after caesarean section is suggested though some studies in the review indicate that oral intake as early as one to two hours after caesarean section is safe. Based on the review findings, both a liquid diet and solid diet can be served as the initial intake after caesarean section. One study indicated that women would be rather relieved of thirst than hunger during the early period after caesarean section.<sup>20</sup> Further investigation is needed on the acceptance of dietary texture for early oral intake after caesarean section. Also specific characteristics of early intake like the food types to be served have to be researched.

The present study concluded that early postoperative feeding does not have a significant effect on gastrointestinal complications compared to delayed postoperative feeding. The wide variations between results of previous studies and our study could be due to differences in ethnicity, time of beginning of oral feeds among the early fed women, type of feed given, mode of anaesthesia and the presence or absence of intraoperative complications. However our observations were concordant with those of the previous studies. Further studies with larger sample size may be required to confirm statistically significant results.

**Table 10**

| Rate of ileus symptoms     | Chantarasorn et al | Adupa et al | Izbizky et al | Orji et al | Present study |
|----------------------------|--------------------|-------------|---------------|------------|---------------|
| Early feeding group        | 19.6%              | 15.6%       | 17%           | 15%        | 0%            |
| Conventional feeding group | 31.1%              | 29.5%       | 16%           | 13%        | 6.44%         |

**Table 11**

| Mean time interval to bowel movement (hours) | Chantarasorn et al | Kovavisarach et al | Adupa et al | Izbizky et al | Orji et al | Present study |
|--|--------------------|--------------------|-------------|---------------|------------|---------------|
| Early feeding group                          | 16.7               | 25.49              | 24.2        | 12            | 18.9       | 6.97          |
| Conventional feeding group                   | 25.3               | 28.67              | 34.2        | 15            | 36.21      | 14.96         |

**Table 12**

| Mean duration of IV fluids (hours) | Chantarasorn et al | Kovavisarach et al | Present study |
|------------------------------------|--------------------|--------------------|---------------|
| Early feeding group                | 20.5               | 19.9               | 23.4          |
| Conventional feeding group         | 24.8               | 22.8               | 40.3          |

**Table 13**

| Mean hospital stay(days)   | Chantarasorn et al | Adupa et al | Orji et al | Present study |
|----------------------------|--------------------|-------------|------------|---------------|
| Early feeding group        | 4.66               | 5.5         | 4.8        | 4.66          |
| Conventional feeding group | 6.68               | 6           | 6.69       | 6.68          |

**CONCLUSION**

Early feeding after an uncomplicated cesarean section has reduced the rate of ileus symptoms, mean time interval for bowel movements to appear, duration of intravenous fluid administration, and length of post-operative hospital stay. Further studies with a large sample size are needed to confirm statistically significant findings.

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