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# Early versus delayed oral feeding after cesarean section: A Randomized controlled trial

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**Keywords:** early feeding; delayed feeding; elective CS; intestinal recovery; postoperative pain.

## Synopsis

Early oral feeding is superior to delayed oral feeding in gastrointestinal recovery and bowel opening after cesarean section

## Abstract

**Objective:** to compare the effects of early versus delayed oral feeding after Cesarean section (CD).

**Study design:** A Randomized controlled trial included 200 pregnant women who underwent elective CD under regional anaesthesia. They were randomized into two feeding groups. Group I [early feeding] in which women started oral feeding 6 hours after surgery. Group II [delayed feeding] in which women started oral feeding only after return of bowel sounds. The primary outcome parameter was women satisfaction.

**Results:** Women in the early feeding group have earlier bowel sounds ( $6.71 \pm 1.612$  vs.  $8.32 \pm 3.156$ ,  $P = 0.01$ ), bowel opening ( $8.53 \pm 1.55$  vs.  $10.96 \pm 2.156$ ,  $P < 0.001$ ) and discharge from hospital ( $21.2 \pm 4.6$  vs.  $29.2 \pm 6.1$ ,  $P < 0.001$ ) when compared to those in the delayed feeding group. No difference between women in the 2 groups regarding Pain score at 2,6 and 12 hours after surgery or GIT symptoms named nausea, vomiting or distension ( $P > 0.05$ ). Women in the early feeding group were significantly more satisfied after the operation than women in the delayed feeding group ( $P < 0.001$ ).

**Conclusion:** Early oral feeding after uncomplicated CD was safer, more convenient and reduces hospital stay costs and it's strongly recommended for all women after uncomplicated CD.

**Keywords:** early oral feeding; elective caesarean section; gastrointestinal symptoms.

## **Introduction**

Caesarean delivery [CD] is the most common surgical procedure in modern obstetric practice that excessively performed in the last few decades [1]. CD has an essential role in decreasing perinatal mortality and morbidity [1,2]. 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 [2,3]. After CD, 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 [4]. 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 CD is often based on the assumption that the bowels are not usually exposed or handled during CD [5,6]. There is no specific time for early oral feeding after CD, it depends on practical custom. Oral feeding is considered after 2-24 hours in different trials. There are controversies about the optimum time of feeding after CD. Some studies provide evidence that early oral feeding after surgery enhances the return of bowel function and does not increase the risk of postoperative complications [7] and advised that early feeding should be initiated without fear of any side effects [8]. while others could not provide such information. Our prospective randomized controlled trial aim to compare the effects of early oral feeding versus delayed oral feeding on gastrointestinal function and women satisfaction after CD.

## **Materials and methods**

This prospective, two-arm, single blind, randomized controlled trial was conducted at

KASR ALAINY maternity hospital between September 2018 and October 2019. The study was prospectively registered at clinicaltrials.gov [registration ID NCT03680391] after approval of the local ethical committee of Cairo university.

A total of 200 women who underwent elective CD participated in this work. Their age ranged between 20 and 40 years old, carry a singleton full term fetus and they were candidate of elective lower segment CD under spinal anaesthesia. Exclusion criteria included women with medical disorders as anemia, heart, liver or kidney diseases, those who had a known GIT disease or GIT symptoms presented before pregnancy and women with psychological or neurological complains that may affect the GIT symptoms or subjective assessment of pain and satisfaction scores. Women with intraoperative complications as organ or major vessel injury, women with previous GIT surgery and those who had postpartum hemorrhage were also excluded. All participants have signed an informed written consent.

Before assignment, all participants were evaluated through complete history and examination to ensure stickiness to the inclusion and exclusion criteria. Transabdominal obstetric ultrasonography was done to confirm the gestational age and evaluate the fetal condition and routine laboratory investigations were done to evaluate fitness for surgery and anaesthesia.

Randomization was done on the same day of the operation using computer-generated random numbers to either early or delayed feeding group. The surgeon and the outcome assessor were blinded for randomization process.

All CD were done by an obstetrician with at least 5 years of experience using the same technique. All used The Munro-Kerr technique through a pfannenstiell incision, uterine incision was transverse located at the lower segment which was closed in 2 layers

followed by closure of both visceral and parietal peritoneum. Neither towel packing of the gutters nor peritoneal irrigation was done.

transverse lower uterine segment incision, immediate cord clamping after delivery of baby, closure of uterus by 2 layers, closure of abdomen in layers. After the operation, women in group 1 (103 women) started oral fluids after 6 hours of surgery irrespective to intestinal sounds, flatus or stool while women in group 2 (97 women) started oral fluids after audible intestinal sounds and semisolid food after passage of flatus or stool.

The primary outcome parameter was maternal satisfaction measured using VAS scale where 0 indicated complete dissatisfaction and 10 indicates the maximum satisfaction. Secondary outcomes included the time of bowel opening, occurrence of nausea, vomiting or abdominal distension, postoperative pain score and the time of discharge from the hospital

Sample size calculation was done using the comparison of patient satisfaction between early and conventional late feeding after CD. Calculation was done based on comparing two proportions from independent samples in a prospective study using Chi test. The  $\alpha$ -error level was fixed at 0.05. The power was set at 90% and the intervention groups' ratio was set at 1:1. As previously published, the incidence of patient satisfaction among mother with early feeding was 73% while it was 39% in conventional feeding mothers' group [9]. Accordingly, the minimum optimum sample size should be 94 participants in each arm. We recruited 105 women in each group to compensate for any drop out cases. Sample size calculation was done using PS Power and Sample Size Calculations software, version 3.0.11 for MS Windows.

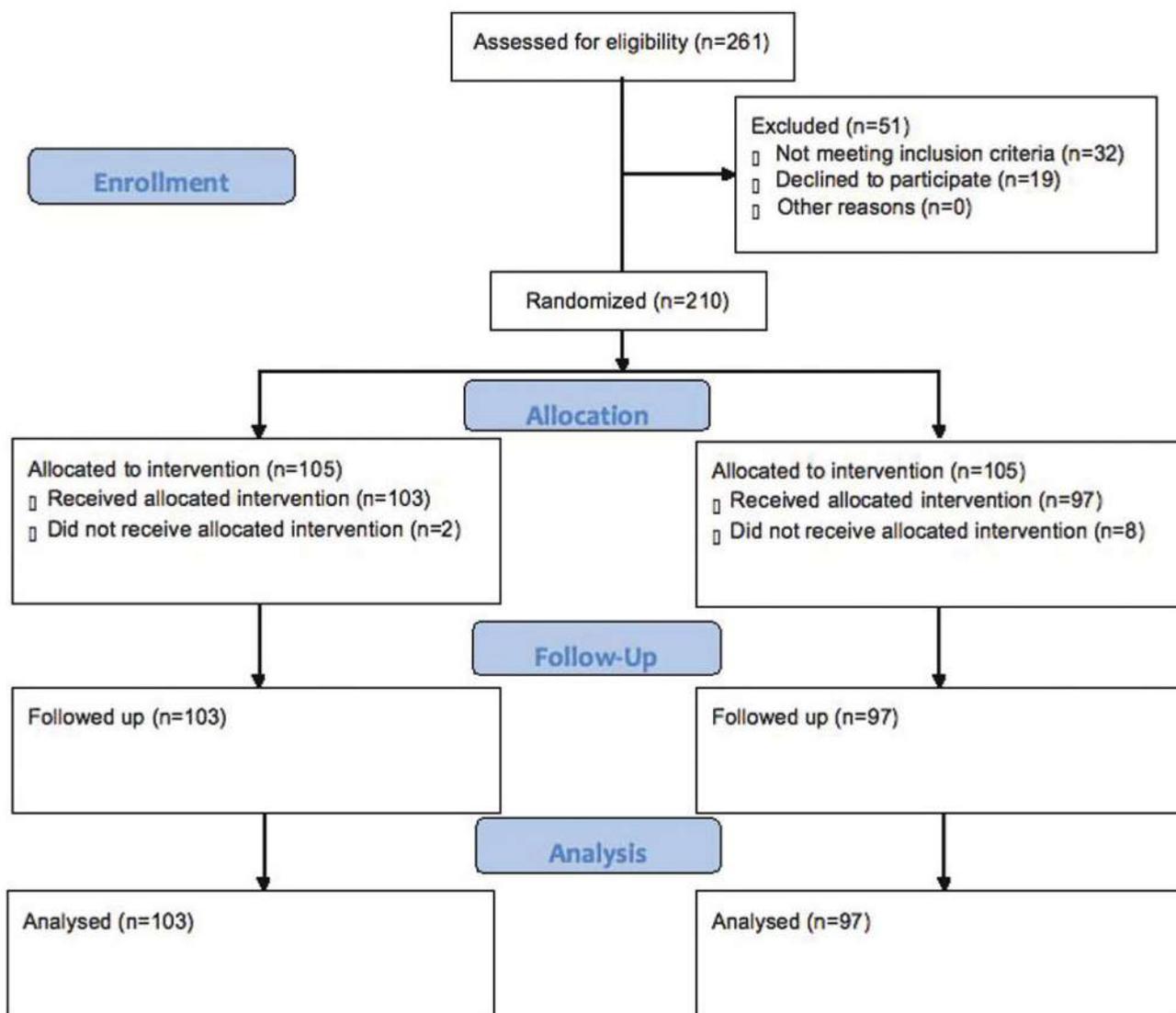
## **Statistical analysis**

Data were collected and then were analyzed using the software package for the social sciences [SPSS], version 25.0 [Armonk, NY]. Demographics and menstrual data were summarized with descriptive statistics such as frequencies, percentages, and means. Categorical variables will be described as numbers and percentage and analyzed using the chi-square test. Continuous variables will be presented as a mean and standard deviation and compared with Student's t-test [The independent sample t-test for intergroup analysis of continuous variables, and dependent sample t-test for intragroup analysis between the discrete time points in the same group]. Besides, a two-sided  $P < 0.05$  was considered as statistically significant.

## **Result**

A total of 261 women were assessed for eligibility. Fifty-one women were excluded from the study (32 don't meet the inclusion criteria and 19 refused to participate). Randomized allocation of 210 women equally to groups. In the early feeding group 2 women didn't receive the intervention as intraoperative complications were encountered during the operation while in the delayed feeding group 8 women didn't receive the intervention as 3 had intraoperative complications and 5 refused to complete the study (figure 1).

**Figure 1: consort flow chart**



There was no significant difference between the early feeding and the delayed feeding groups regarding maternal age, body mass index, gestational age, neonatal birth weight, number and indications of CD. Similarly, no significant difference was found between women in the 2 groups regarding intraoperative blood loss, operative time, or the time of ambulation after surgery (table 1).

**Table 1 baseline characteristics of the study population**

		Early feeding (n=103)	Delayed feeding (n=97)	P value	
Age (years)		27.96 ± 4.551	28.26 ± 5.261	0.271	
BMI (Kg/m <sup>2</sup> )		28.3 ± 5.039	28.11 ± 4.318	0.761	
Gestational age (weeks)		38.24 ± 1.033	38.28 ± 0.944	0.812	
Neonatal birth weight (gm)		3243±475	3314±525	0.532	
Cesarean section (CS)	Number of previous CS	1.23 ± 0.797	1.47 ± 0.812	0.293	
	Indication of CS	Repeated CS	31 (30.1%)	25 (25.77)	0.169
		Malpresentation	28 (27.18%)	31 (31.96%)	
		CPD	21 (20.39%)	18 (18.56%)	
		Failure of progress	17 (16.5%)	11 (11.34%)	
		Others	6 (5.82%)	12 (12.37%)	
	Operative time (min)	49.2±14.2	51.6±16.2	0.152	
Intraoperative blood loss (ml)	623±216	584±278	0.153		
Time of ambulation		5.9±0.7	6.1±0.8	0.721	
Start of feeding		6	10.65 ± 2.15	<0.001	

Data are presented as mean ± SD or Number (percent)

BMI Body mass index; CPD cephalopelvic disproportion

There was no significant difference between women in the early feeding group and those in the delayed feeding one regarding Pain score at 2,6 and 12 hours after surgery or GIT symptoms named nausea, vomiting or distension (table 2).

Women in the early feeding group have earlier bowel sounds ( $P=0.01$ ), bowel opening ( $P<0.001$ ) and discharge from hospital ( $P<0.001$ ) when compared to those in the delayed feeding group (table 2). Women in the early feeding group were significantly more satisfied after the operation than women in the delayed feeding group (table 2).

**Table 2 Postoperative outcome parameters**

		Early feeding (n=103)	Delayed feeding (n=97)	P value
+ve bowel sounds		6.71 ± 1.612	8.32 ± 3.156	0.01
Bowel opening		8.53 ± 1.55	10.96 ± 2.156	<0.001
Pain score	At 2 hours	0.61 ± 0.31	0.59 ± 0.42	0.612
	At 6 hours	4.13 ± 1.65	4.87 ± 1.81	0.664
	At 12 hours	6.1 ± 2.1	6.3 ± 2.0	0.391
Satisfaction score		8.1 ± 0.8	5.2 ± 1.2	<0.001
GIT symptoms	Nausea	14 (13.59%)	18 (18.56%)	0.259
	Vomiting	3 (2.91%)	5 (5.15%)	0.211
	Distension	3 (2.91%)	4 (4.12%)	0.786
Discharge		21.2 ± 4.6	29.2 ± 6.1	<0.001

Data are presented as mean ± SD or Number (percent)

## **Discussion**

Our prospective randomized controlled trial showed that early oral feeding is superior to delayed oral feeding in gastrointestinal recovery and bowel opening after CD.

Recovery of the normal peristalsis of the small intestine occurs 4 -8 hours after laparotomy and resuming of the gastric emptying occurs in the first day after it [10-12].

Early oral intake enhanced recovery postoperative gastrointestinal movement. This movement have different eating and postprandial forms. It's characterized by alternating periods of forceful contractions and quiescence in between meals and presence of food in the intestine changes that pattern to random bursts of spike potential [13]

Previous studies suggested that oral feeding can started in most cases immediately after surgery as they found no beneficial effects of gastric decompression even after GIT surgery [14].

Three meta-analyses showed that early postoperative feeding is associated with significantly lower complications when compared to the classic delayed feeding and a significantly beneficial effects on bowel recovery and hospital discharge [15-17].

In our study there was no significant difference between early feeding and delayed feeding women regarding GIT complications as nausea , vomiting or distension

Tavasolli and colleagues reported no significant difference between early and delayed feeding groups regarding occurrence of vomiting.[18]. The same findings were reported by Stewart et al [19] and Seenu and Goel [20]

According to our findings, women who started their oral feeding early were significantly more satisfied than those who started it late.

In our study, Women with early feeding were discharged from the hospital earlier than women with delayed feeding.

A meta-analysis that included 2112 adult patients who had upper gastrointestinal surgery included in 15 trials (8 of them were RCTs) proved that early feeding was associated with significantly shorter hospital stay [21].

Recent meta-analysis regarding to our topic made on 11 article indicated that EOF is associated with early back to bowel function recovery and does not increase the risk of postoperative complications. Oral intake within 8 h as a part of standard care for women who undergo CD is recommended. However, this study included some heterogeneity of included studies [7].Several studies reveals that early oral feeding has better effects on gastrointestinal functions compared to delayed oral feeding after CD [8]. Guo et al made meta-analysis on 20 articles showed that early oral feeding is safe and accelerates recovery after CD. Early oral feeding led to a clinically significant reduction in time to return of gastrointestinal function, lowered the amount of postoperative care needed, reduced hospital stay, and shortened time to first breastfeeding, without increasing rates of postoperative complications[22].

Mehta et al stated early oral intake of food, following uncomplicated CD under regional anesthesia, is safe and well tolerated produces a better outcome, compared to delayed feeding; does not cause significant increase in postoperative paralytic ileus; and results in better patient satisfaction[23]. Aydin at al recommended oral feeding 2 hours after CD under regional anesthesia to achieve rapid postoperative recovery and early hospital discharge [24]. Another study reveals that early-oral intake after an elective CD is well tolerated by patients and promoted gut function without an increase in postoperative nausea and vomiting[25].

Moreover, Izbizky et al stated that early feeding after a CD in low-risk women increased women satisfaction, was as safe as the traditional approach with more beneficial effects on women's perceived pain [26].

Jalilian et al revealed that early oral feeding 2 h post-cesarean section reduced the time required for return of normal bowel function. This is without significant detrimental effects on the incidence of gastrointestinal complications[27].

To the best of our knowledge, our study is the first RCT with properly calculated sample size to evaluate all outcomes of patient satisfaction, GIT complications and hospital stay after CD. We can conclude that early oral feeding after uncomplicated CD is safer, more convenient and reduces hospital stay time and costs compared to delayed feeding and it is strongly recommended for all women after uncomplicated CD.

### ***Compliance with Ethical Standards***

The study was performed in accordance with the Declaration of Helsinki ethical standards. Informed consents were taken from study participants.

### ***Author contributions***

MI Mostafa: Data analysis, Manuscript writing, manuscript revision

BM Elbokl : Data collection, Manuscript writing

M Shalaby: Data analysis, manuscript revision, project development

### ***Disclosure***

The authors report no conflicts of interest in this work

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