



## A Comparative Study of Early Versus Delayed (Conventional) Oral Feeding After Caesarean Delivery

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### ABSTRACT

**Background:** To evaluate the effect of early oral feeding versus delayed after uncomplicated caesarean section, under regional anaesthesia on women's satisfaction and post operation outcome as per ERASS (Enhanced Recovery After Surgery Society) recommendations (Part-3) given in 2019. The study was undertaken at a tertiary care hospital MV Jayaram medical college and research hospital Bangalore, India; between 2020-2021. It was a prospective observational study. All healthy pregnant women undergoing caesarean delivery were selected and informed about ERASS protocol, out of which those with uncomplicated singleton pregnancy undergoing caesarean under spinal anaesthesia were allocated into two groups EF (Early Feeding: after 2 hours) and DF (Delayed feeding: 18-24 hours) and initiated oral feeding.

Maternal satisfaction was studied as primary outcome and gastro intestinal function (i.e. Return of bowel sounds, passage of flatus and stool), mobilization and any complications in post-operative period as secondary outcome.

**Results:** Out of 626 women admitted to our hospital for delivery, 148 women undergoing C-section were randomized into delayed feeding (n=78) and early feeding (n=70). Maternal satisfaction was almost similar in both the groups DF=80%; EF=98.57%. High statistical difference was noted in EF group for return of bowel sounds  $4.71 \pm 1.83$  hours vs.  $13.72 \pm 3.08$  hours; passage of flatus  $9.89 \pm 3.00$  hours vs.  $13.72 \pm 3.08$  hours and ambulation  $9.57 \pm 1.62$  vs.  $14.95 \pm 3.9$  hours.

**Conclusion:** ERASS strategy is safe, approach to post-operative care in clinical practice in those undergoing caesarean delivery. Though our observations on maternal satisfaction were equivalent but our variables on secondary outcome were highly significant without any adverse gastro intestinal complications.

**Keywords:** Caesarean section, Early Feeding (EF), Delayed Feeding (DF), Bowel Sounds (BS), Flatus, Ambulation, Maternal Satisfaction.

### INTRODUCTION

The incidence of caesarean delivery as safe method of delivery has increased tremendously in the last decade. As per the latest data (National Family Health Survey 2015-2016 (NFHS-4)), the caesarean rates at population level in

India seem to be 17.2% caesarean sections are generally short operations involving minimal, if any bowel manipulation in young healthy women. Practices vary among individual practitioners and different institutions worldwide regarding the post-partum dietary management and safe timing for reintroduction of solids [1].

Historically patients were fasted following abdominal surgery until return of bowel sounds or passage of flatus. Based on a physiologic study of digestive tract, stomach and small bowel resume function within eight hours [2], large bowel activity returns within 48 hours and recto sigmoid function recovers within 72 hours post operatively.

Some studies have reported that Early Oral Feeding (EOF) enhanced gastrointestinal function recovery, resulting in good nutritional status, rapid wound healing, early ambulation and an early return to normal daily life activities.

Enhanced Recovery After Surgery (ERAS) is a standardized, perioperative care program that is embedded firmly with in multiple surgical disciplines, which has shown to result in both clinical benefits (reduction in length of stay, complications, re-admissions) and health system benefits (reduction in cost) [3].

## MATERIALS AND METHODS

This was a hospital based prospective observational study in department of obstetrics and gynecology in MVJ medical college and research hospital for a period of one year. Nov 2020 to Oct 2021. The study included all pregnant women admitted for caesarean delivery, who were informed about the study and “Enhanced Recovery After Surgery Society” (ERASS) protocol. Women who had general anaesthesia, those treated with magnesium sulphate, tocolytic drugs, previous bowel surgery, intra operative bowel injury or other conditions like pre-existing GI disorders (IBS, peptic ulcer) that preclude early feeding were excluded. Hospital ethics committee approval obtained and all subjects gave prior written informed consent. Consenting women, who underwent uncomplicated caesarean delivery, were assigned in 2 groups [4]. The study population having 148 women. Group A (n=78); group B (n=70). Group A received conventional diet schedule fasting for 18-24 hours, that is nil orally for 18-24 hours post operatively, then orally allowed after bowel sounds, were heard, by sipping water, followed by liquid diet, then soft diet/regular diet subsequently. Group B women received EOF (early oral feeding) as per recommendation by ERASS Protocol. That is sipping of water at 2-8 hours post operatively, followed by soft/regular diet liquid diet like tender coconut water, porridge (conjee), soup, fruit juice, milk followed by low residual diet consisting of vegetables and fruits, progressed to regular normal diet of patient’s choice [5].

Relevant information collected to study the outcome in both the groups which included maternal age, parity, gestational age, previous abdominal surgery (Intra operative adhesions), whether emergency or elective caesarean section, time of maternal ambulation, time of return of gastrointestinal motility, post-operative gastrointestinal complications, maternal satisfaction, any other complications were documented by faculty consultant, resident on call in department of OBG [6].

Intra operative intravenous fluid was given to all groups until the women tolerated oral intake well. IV hydration was discontinued when patient successfully completed a meal without nausea or vomiting. Patients received Inj ceftaxim 1 gm bd. Early breast feeding was encouraged in both the groups. Baseline demographical and operative characteristics were obtained. Duration of surgery defined as the time from onset of surgery to skin closure, cessation of IV hydration and removal of IV cannula were recorded in hours after completion of surgery. Maternal satisfaction pertaining to feeding regime was recorded on a (0-10) Visual Analogue Scale (VAS) with 0, meaning not satisfied to 10 being most satisfied. The women were examined [7] and documentation done by consultant/obstetrician/gynaecology resident. Patients were considered ready for discharge, if they were tolerating solid food without emesis, ambulating afebrile with minimal post-operative pain that was easily controlled with oral analgesics. Post-operative GI complications like nausea, vomiting, abdominal discomfort, distention and paralytic ileus or any other undesirable outcome noted [8].

## RESULTS

148 women were randomized immediately post caesarean in to two groups over a period of one year. Group A (n=78); (delayed) group (n=70) (EOF) (Tables 1 and 2).

**Table 1 Both groups were comparable with respective demographics**

		Group (A) N=78	Group (B) N=70	T Value	P Value
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S. no					
1	Age (m+SD)	24.79 ± 4.37929	25.09 ± 3.86265	0.42638	0.335231 (ns)
2	Gest. Age (m+SD)	37.96 ± 3.38811	38.06 ± 2.0351	0.3001	0.382265 (ns)
3	Primigravide	33	37	CSS 1.6471	0.199353 (ns)
4	Previous past cs	45	33	1.6471	0.199353

**Table 2 The operative characteristics of both the groups were comparable**

S. no		Group A	Group B	Chi square score	P Value
1	Adhesions	3	1	0.82	0.365191(ns)
2	PPH (>1 litre)	2	1	0.2395	0.624544 (ns)
3	Duration of surgery	54.35 ± 15.87342	53.36 ± 11.98433	T. Score 0.41846	0.338111 (ns)
4	Nausea vomiting	8	6	CSS 0.1223	0.726558 (ns)

No difference in adhesion rate, surgical duration, blood loss and nausea, vomiting, was observed.

Group B had received early oral sips within 2-8 hours, once bowel sounds were heard ( $4.71 \pm 1.83479$  hours vs.  $13.72 \pm 3.08704$  hours) and ambulated early ( $9.57 \pm 1.62919$  hours versus  $14.95 \pm 3.93089$  hours) which were highly significant [9].

High statistical significant difference was observed in passage of flatus (in hours) due to early ambulation in group B ( $9.89 \pm 3.00503$  hours vs.  $13.72 \pm 3.08704$  hours) and also passage of first stool, was significant ( $47.31 \pm 15.81005$  vs.  $55.15 \pm 18.9592$ ) (Table 3) [10].

**Table 3 Post-operative outcome of the study group**

S. no		Group A	Group B	T Value	P Value
1	Volume of IV Fluids (in litres)	$2.52 \pm 0.41437$	$1.76 \pm 0.30387$	2.63575	<0.00001 (HS)
2	Time for B.S (Bowel sound) (hours)	$13.72 \pm 3.08704$	$4.71 \pm 1.83479$	21.2595	<0.00001 (HS)
3	FLATUS (in hours)	$13.72 \pm 3.08704$	$9.89 \pm 3.00503$	7.63525	<0.00001(HS)
4	Stool passed (hours)	$55.15 \pm 18.9592$	$47.31 \pm 15.81005$	2.69147	0.03981 (S)
5	Vomiting	8	3	CSS 1.9116	0.166789 NS
6	Ambulation (in hours)	$14.95 \pm 3.93089$	$9.57 \pm 1.62919$	10.65074	<0.00001 (HS)
7	Removal of Foley's	$18.09 \pm 2.68321$	$11.51 \pm 1.43196$	T.V 18.29396	<0.00001 (HS)

8	VAS maternal satisfaction ( $\geq 8$ )	63	69	CSS 12.1257	0.000497 (S)
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Not much difference was observed in both groups with respect to immediate post-operative nausea and vomiting. Group B patients had shorter duration of IV hydration ( $1.76 \pm 0.30387$  hours vs.  $2.52 \pm 0.41437$ ) and hence early removal of Folley's catheter ( $11.51 \pm 2.68321$ ) which was statistically significant [11].

However, a small but statistically significant difference was noted in woman's satisfaction in favour of early feeding group. Both groups did not display any major operative complication before discharge.

## DISCUSSION

From time immemorial traditional feeding practices were followed by most clinicians worldwide, which have been challenged by many studies and clinical trials. Globally rising trends of caesarean section rates ignited concern for post-operative care, which is vital for multiple surgical disciplines. ERAS Society 2019, (Enhanced Recovery after Surgery) has come up with guidelines for post-operative care in caesarean delivery with strong recommendation to provide quality care and focused on maternal safety. Taking in to account (ERAS) [12] society recommendations part-3, we have undertaken the study to evaluate the impact of ERAS guidelines to our post-operative care, with maternal satisfaction as primary outcome. And time of return of gastrointestinal function, maternal ambulation and any adverse post-operative complications as secondary outcome.

Incorporating VAS scale (Visual Analog Scale) based on the validated previous studies we have assessed maternal satisfaction. Though our early feeding group had higher sense of satisfaction and enthusiasm for early breast feeding, statistical significance was small when compared to conventional group. Most of the clinicians do agree, satisfaction is based on psychological response and influenced by several other factors for example post-operative pain and in our country gender of baby matters to many women.

Teoh and Mohammad otthman, Saudi Arabian study 2019, in Pakistan study by Nadia in 20201, registered in favour of high maternal satisfaction in early feeding regimen. Our results were more or less consistent with Izbizky RCOG and Esra ozbaslin Turkish study 2020 where they documented as equivalent [13].

Though IV antibiotics, IV antiemetic given 1hour prior to surgery keeping with standard ward practice, however nausea was main concern in our early fed group but not significantly enough to demotivate our participants. Similar analysis was made by Hsu YY 2013 meta-analysis and Ezra (Table 4).

**Table 4 Table showing the DF and EF of all stages after delivery**

	Maternal Satisfaction		Time for return of BS (hrs.)		Passage of Flatus (hrs.)		Passage of Stools (hrs.)		Ambulation (hrs.)	
	EF	DF	EF	DF	EF	DF	EF	DF	EF	DF
Our Study	98.5%	80%	4.71 +/- 1.834	13.72 +/- 3.0814	9.89 ± 3.00	13.72 ± 3.08	47.31	55.15	9.57 ± 1.629	14.95 +/- 3.93
Nadia	80%	49%	7.8 ± 0.93	11.75 +/- 0.91	12.38 ± 0.66	15.12 ± 0.54			77% in <15 hrs	65% in <15 hrs
Esra Ozbasli	92.30%	89.65%			17.32 ± 8.19	18.73 ± 9.51	32.26 ± 9.55	33.57 ± 11.73	5.69 ± 1.20	5.95 ± 1.45
Teoh	90%	60%	95.90%	90.80%	14.4	21.0	44.4	65.6		
Ernest O. Orji			18.90 ± 4.17	36.21 ± 3.52	44.81 ± 3.73	60.58 ± 4.40	58.30 ± 5.91	72.76 ± 4.25		
Chalaithom	90%	90%			26.9 ± 16.1	36.8 ± 16.8			20.3 ± 3.6	30.0 ± 4.4

Izbizky	77 ± 13	73 ± 17			22 ± 14	23 ± 12	12 ± 11	15 ± 11		
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Evidence based on studies and RCT by Jallian, Teoh, Orji Masood, Nantuspha, Hsu YY, early resumption of solid food result in accelerated return of bowel motility and demonstrated reduction in thirst, hunger influencing maternal satisfaction. Time for return of bowel sounds passage of flatus was highly significant in our study. Similar observations were made by Nadia and Hsu, Jallian. Most of our participants in both groups mobilized within groups 15 hours  $P < 0.00001$ . Similar findings reported by Masood. However Nadia reported only 77% ambulated in early fed group within 15 hours.

Requirement of IV fluids was considerably decreased once tolerance to oral feeds was established without any undesirable outcomes like dehydration and electrolyte imbalance. Our observations were comparable to Masood (Pakistan study), where requirement was 1-1.5l in EF group when compared to DF group (Delayed feeding group).

Early resumption of fluids and food motivated the participants to ambulate and hence early discontinuation of IV fluids, once better tolerance to diet and compliance was established. It also reinforced the enthusiasm and energy in the EF study group and encouraged participants for early Breast feeding. Removal of indwelling foleys catheter was done 11.51 hours in early feeding group when compared to conventional group. ERAS society emphasized on removal of catheter “in those who do not need strict monitoring of urine output.” Studies by Senawayake, Nasar indicated low incidence of urinary retention, shortens mean time to ambulate and void and hence length of hospital stay from which NICE guidelines were based for early removal of catheter.

Return of GI function and Ambulation aided bowel movement (passage stool in hours). Our observation regarding this was 47.31 hours in EF, when compared to 55.15 hours in conventional diet group. Our findings were supported by 2 studies Ernest and Teoh. However Turkish study found their equivalent in both arms.

ERAS strategy raised concern regarding post-operative complications like paralytic ileus, abdominal distention based on previous studies; some of them classified ileus as mild, severe. Mild defined as nausea and abdominal pain in first 12 hours and severe ileus was defined as persistent nausea, vomiting more than 4 times, associated with abdominal pain, distention  $> 6$  cm at the level of umbilicus 12 to 24 hours. However, such adverse outcomes were not encountered in our study. Most of the recent trials supported this.

Description of diet varied in many studies, subjected to cultural norms, availability and resources. Many studies and multiple clinical trials focused from post-operative sham feeding to on-demand feeding. Chewing gum appeared as safe low risk approach of sham feeding, which was effective but evidence is low for recovery of gastro intestinal function. Immediate compared with on-demand feeds by Tan based on NICE guidelines, (UK) emphasized on a starting feeds. During immediate post-operative period (Subway Sandwich with substantial salad vegetables considered as normal meal item in his trial; concluded that in the excitement of initiation of early feeding, the study sidelined the post-operative care as priority.

In present study the diet chosen was liquids like tender coconut water, porridge, soup, fruit juice, and milk followed by low residual diet supplementing calories, consisting of fruits and vegetables which was advanced to regular normal diet, as tolerated [14].

Hospital stay was not considered as study variable in present study; as the institute standard protocol is to discharge mother after 6-7 days. Since our study is in tertiary care hospital consisting of rural population, most of the participants prefer to stay for neonatal care which added to our advantage; to observe the effect of early oral feeds on wound healing and delayed outcomes.

Most of the previous studies taken hospital stay as study secondary outcome and derived observations, which indicated decreased hospitalization which reduces financial burden and as a feasible cost effective approach.

## CONCLUSION

ERAS protocol can be implemented safely in a standard tertiary care hospital, in clinical practice as an effective approach to limit financial burden, to encourage mothers for breast feeding, hastens recovery without detrimental effect on bowel function. Our findings are supporting the existing robust literature on safety and benefits of this strategy. It also creates a possibility of setting trend for day care caesarean section in future.

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**REFERENCES**

- [1] Arif N, et al. Impact of early vs delayed oral feeding on hospital stay after Caesarean section under regional anesthesia. *Pakistan Armed Forces Medical Journal*, Vol. 70, No. 4, 2020, pp. 1138-1142.
- [2] Macones GA, et al. Guidelines for postoperative care in Caesarean delivery: Enhanced recovery after surgery (ERAS) Society recommendations (part 3). *American Journal of Obstetrics and Gynecology*, Vol. 221, No. 3, 2019, pp. 247.e1-247.e9
- [3] Masood SN, et al. A randomized comparative trail of early initiation of oral maternal feeding versus conventional oral feeding after Caesarean delivery. *International Journal of Gynecology and Obstetrics*, Vol. 126, No. 2, 2014, pp. 115-119.
- [4] Hsu YY, et al. Early oral intake and gastrointestinal function after Caesarean delivery: A systematic review and meta-analysis. *Obstetrics and Gynecology*, Vol. 121, no. 6, 2013, pp. 1327-1334.
- [5] Ozbasli E, et al. Comparison of early and on-demand maternal feeding after Caesarean delivery: a prospective randomized trial. *Singapore Medical Journal*, Vol. 62, No. 10, 2020, pp. 542-545.
- [6] Teoh WH, Shah MK, Mah CL. Randomized control trial on beneficial effects of early feeding Post-Caesarean delivery under regional anaesthesia. *Singapore Medical Journal*, Vol. 48, No. 2, 2007, pp. 152-157.
- [7] Orji EO, et al. A randomized control trial of early initiation of oral feeding after Caesarean section. *The Journal of Maternal-fetal and Neonatal Medicine*, Vol. 22, No. 1, 2009, pp. 65-71.
- [8] Nantasupha C, et al. Effect of conventional diet schedule, early feeding and early feeding plus Domperidone on Post caesarean diet tolerance: A randomized controlled trial. *Journal of Obstetrics and Gynecology Research*, Vol. 42, No. 5, 2016, pp. 519-525.
- [9] Tan PC, et al. Immediate compared with on-demand material full feeding after planned Caesarean delivery: A randomized trial. *BJOG: An International Journal of Obstetrics and Gynaecology*, Vol. 124, No. 1, 2017, pp. 123-131.
- [10] Othman M. Early versus late oral feeding on the recovery of normal bowel functions after caesarean section: A randomized control study. *Advances in Medicine and Medical Research*, Vol. 2, No. 1, 2019, pp. 21-25.
- [11] Patolia DS, et al. Early feeding after Caesarean: Randomized trial. *Obstetrics and Gynecology*, Vol 98, No. 1, 2001, pp. 113-116.
- [12] Izbizky GH, et al. The effect of early versus delayed Post caesarean feeding of women's satisfaction: A randomised controlled trial. *An International Journal of Obstetrics and Gynaecology*, Vol. 115, No. 3, 2008, pp. 332-338.
- [13] Senanayake H. Elective Caesarean section without urethral catheterization. *The Journal of Obstetrics and Gynaecology Research*, Vol. 31, No. 1, 2005, pp. 32-37.
- [14] Nasr AM, et al. Evaluation of the use vs. nonuse of urinary catheterization during Caesarean delivery: A Prospective, multi-center, randomized controlled trial. *Journal of Perinatology*, Vol. 29, No. 6, 2009, pp. 416-421.