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Early versus Conventional Feeding and Onset of Lactation in Emergency Cesarean Parturient Mothers

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ABSTRACT

Objectives: To study the onset of lactation between early and conventional feeding in emergency cesarean parturient mothers.

Materials and Methods: Emergency cesarean parturient mothers under spinal block with intrathecal morphine were randomized into two groups. The early feeding group received clear liquid diet 200 milliliter at 6 hours postoperation and then stepped diet as tolerate. The conventional group took a sip of water at 24 hours postoperation then stepped to liquid, soft and regular diet. All participants were informed about signs and symptoms of maternal perception of onset of lactation that consisted of breast fullness, breast tingling and milk leakage. Then they had to record timing if she had any one of signs and symptoms of onset of lactation.

Results: Two hundred and thirty-eight participants were participated in the study, 119 in each group. The onset of lactation was 30.1 ± 12.9 hours and 46.3 ± 10.8 hours in early feeding and conventional feeding group, respectively ($p < 0.01$). Only mild symptoms of bowel ileus were found in both groups.

Conclusion: Early feeding in emergency cesarean parturient mothers had a significant earlier onset of lactation when compare with conventional feeding without serious adverse gastrointestinal complications.

Keywords: Onset of lactation, emergency cesarean section, early feeding, conventional feeding.

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การรับประทานอาหารเร็วเปรียบเทียบกับการรับประทานอาหารตามขั้นตอนกับการเริ่มหลั่งของน้ำนมเต็มเต้าในมารดาหลังคลอดที่ผ่าตัดคลอดฉุกเฉิน

ธัญธร ศรีสถาพร, รุ่งฤดี จีระทรัพย์

บทคัดย่อ

วัตถุประสงค์: *เพื่อศึกษาถึงระยะเวลาการเริ่มหลั่งของน้ำนมเต็มเต้าในมารดาหลังคลอดที่ผ่าตัดคลอดฉุกเฉิน เปรียบเทียบระหว่างการรับประทานอาหารเร็ว และการรับประทานอาหารตามขั้นตอน*

วิธีการดำเนินวิจัย: *มารดาหลังคลอดที่ผ่าตัดคลอดฉุกเฉินโดยระงับความรู้สึกด้วยการฉีดยาชาและมอร์ฟีนเข้าช่องไขสันหลัง ถูกสุ่มแบ่งเป็น 2 กลุ่ม ได้แก่ กลุ่มที่รับประทานเร็ว รับประทานน้ำหวาน 200 มิลลิลิตร 6 ชั่วโมงหลังผ่าตัด แล้วรับประทานอาหารอื่นได้เท่าที่ต้องการ และกลุ่มที่รับประทานตามขั้นตอน จิบน้ำที่ 24 ชั่วโมงหลังผ่าตัด และรับประทานอาหารเหลว อ่อน และปกติ ตามลำดับ และผู้เข้าร่วมวิจัยทุกคนได้รับข้อมูลเรื่องอาการและอาการแสดงของการเริ่มหลั่งน้ำนมเต็มเต้า ประกอบด้วย เต้านมคัดตึง เสียวแปลบที่บริเวณเต้านม และมีน้ำนมไหล ซึ่งจะมีการบันทึกเวลาเมื่อมีอาการหรืออาการแสดงอย่างหนึ่งของการหลั่งน้ำนมเต็มเต้า*

ผลการศึกษา: *มีมารดาเข้าร่วมการศึกษา 238 คน กลุ่มละ 119 คน พบการหลั่งของน้ำนมเต็มเต้าที่ 30.1 ± 12.9 ชั่วโมง และ 46.3 ± 10.8 ชั่วโมง ในกลุ่มที่รับประทานอาหารเร็วและกลุ่มที่รับประทานอาหารตามขั้นตอน ตามลำดับ ($p < 0.01$) พบเพียงอาการท้องอืดเล็กน้อยทั้งสองกลุ่ม*

สรุป: *มารดาหลังผ่าตัดคลอดฉุกเฉินที่รับประทานอาหารเร็ว มีระยะเวลาการเริ่มหลั่งของน้ำนมเต็มเต้าเร็วกว่ากลุ่มที่รับประทานอาหารตามขั้นตอน อย่างมีนัยสำคัญทางสถิติ โดยไม่พบภาวะแทรกซ้อนของระบบทางเดินอาหารที่รุนแรง*

คำสำคัญ: *การเริ่มหลั่งของน้ำนมเต็มเต้า, การผ่าตัดคลอดฉุกเฉิน, การรับประทานอาหารเร็ว, การรับประทานอาหารตามขั้นตอน*

Introduction

Lactogenesis is the term meaning the initiation of lactation and divided into 2 stages. Lactogenesis I begins at last 12 weeks of pregnancy. Lactogenesis II or onset of lactation (OL), resulting in a copious increase of milk, begins at 2-3 days postpartum. The gold standard for documentation of OL is test weighing. Infants were weighed before and after breastfeeding three times a day continuously to determine milk transfer in each feed then plot graph to find out the maximal point of milk production. However, this method is expensive, invasive and impractical to use in general[1]. Maternal perception of OL is another way to detect OL that consists of breast fullness, breast tingling and milk leakage. This method is practical, noninvasive and inexpensive[1].

Several studies found mothers who had early OL had longer breastfeeding rate and duration[1, 2, 3]. Routes of delivery can affect OL. Previous study found cesarean section had longer time to OL compared with vaginal delivery[4]. Cesarean delivery affects OL due to post-operative pain and fatigue, anemia due to intra operative blood loss, interference from medications caused delay to access the baby and prolonged post-operative starvation when compare with vaginal delivery[5].

Lactating mother increases metabolism and consumes 25% of total energy to produce breast milk[6]. There were several studies had early feeding in post cesarean mothers under spinal block from thirty minutes to eight hours postoperation. They found early post-operative feeding was safe, no significant bowel ileus, earlier ambulation, shorter length of hospital stay and more maternal satisfaction compare to delayed feeding[7, 8]. One study showed early feeding in uncomplicated post cesarean mothers under spinal block also had earlier OL compare with conventional feeding[9].

However, there was no previous study of OL in emergency cesarean section compare between early feeding and conventional feeding. The aim of the current study was to compare OL between early and conventional feeding in emergency cesarean parturient mothers.

Materials and Methods

This randomized controlled trial was conducted at Khon Kaen Hospital. Postpartum emergency cesarean mothers under spinal block with intrathecal spinal morphine were enrolled into the study. Inclusion criteria were postpartum emergency cesarean mother whom performed operation between 06.00 a.m. – 04.00 p.m., singleton and term pregnancy, normal breasts and nipples, neonatal birth weight 2,500 gram or more, rooming-in mother and infant. Exclusion criteria were uncontrolled maternal medical complications such as severe hypertension, poor-controlled diabetes mellitus, heart diseases, serious intraoperative and postpartum complications such as early postpartum hemorrhage, contraindication for breastfeeding such as HIV infection, neonatal birth asphyxia (APGAR score at 1 minute ≤ 7), congenital fetal abnormalities such as tongue ties, clef lip, clef palate.

After operation, mothers with infants were transferred from recovery room to postpartum ward or private room and informed about the study when she was fully consciousness and prompted to receive study information usually within 3-4 hours postoperatively. All participants whom voluntary to join the study were written informed consent and randomized into two groups, early feeding and conventional feeding group, by computer generated list with allocation concealment by sequentially opaque envelopes.

The early feeding group received clear liquid diet 200 milliliters at 6 hours postoperation and then stepped diet as tolerate, the conventional group took a sip of water at 24 hours postoperation then stepped to liquid, soft and regular diet, respectively. They were informed about signs and symptoms of maternal perception of OL that consisted of breast fullness, breast tingling and milk leakage. Then they had to record timing if she had any one of signs and symptoms of OL. The clocks at postpartum wards and private rooms were set for standard time. The maternal perception of OL would be asked by staff nurses who did not involve in the previous procedure three times daily to remind mothers

and confirm signs and symptoms of OL.

The standard postoperative cesarean section care, breast feeding support such as initiated breastfeeding within 1 hour as soon as both mother and infant prompted, positioning and latch on, breastfeeding 10-12 times all day and night were performed similarly in both groups. Demographic characteristics, operative outcomes, gastrointestinal complications, neonatal outcomes, time to ambulation and length of stay were recorded.

The current study was the first study about maternal perception of OL between early feeding and conventional feeding in post emergency cesarean parturient mothers. Though, the sample size calculation was based on the pilot study in thirty participants by use of mean ± standard deviation of OL in early and conventional feeding group (34.5 ± 9.9 hrs and 37.7 ± 7.8 hrs, respectively), α = 0.05, power of 80% and 10% for dropout. Finally, the sample size was one hundred and nineteen per group. This study was approved by Khon Kaen Hospital Institute Review Board in Human Research.

Data analysis was performed with SPSS 17 software. Student t-test and Mann-Whitney U test were used to compare continuous variables depends on distribution between the groups. Chi square and Fisher's exact tests were used for categorical variables as appropriate. Cumulative rate of time to OL was analyzed by survival analysis. The Shapiro-Wilk test was used to test distributions for normality. Differences were considered statistically significant when the p value was < 0.05.

Results

This randomized controlled trial was conducted between January to August 2016. A total of 254 emergency cesarean parturient mothers were eligible, 16 declined to participate the study. Finally, 238 emergency cesarean parturient mothers underwent randomization into early feeding and conventional feeding group, 119 each. Participants flow was shown in Fig. 1.

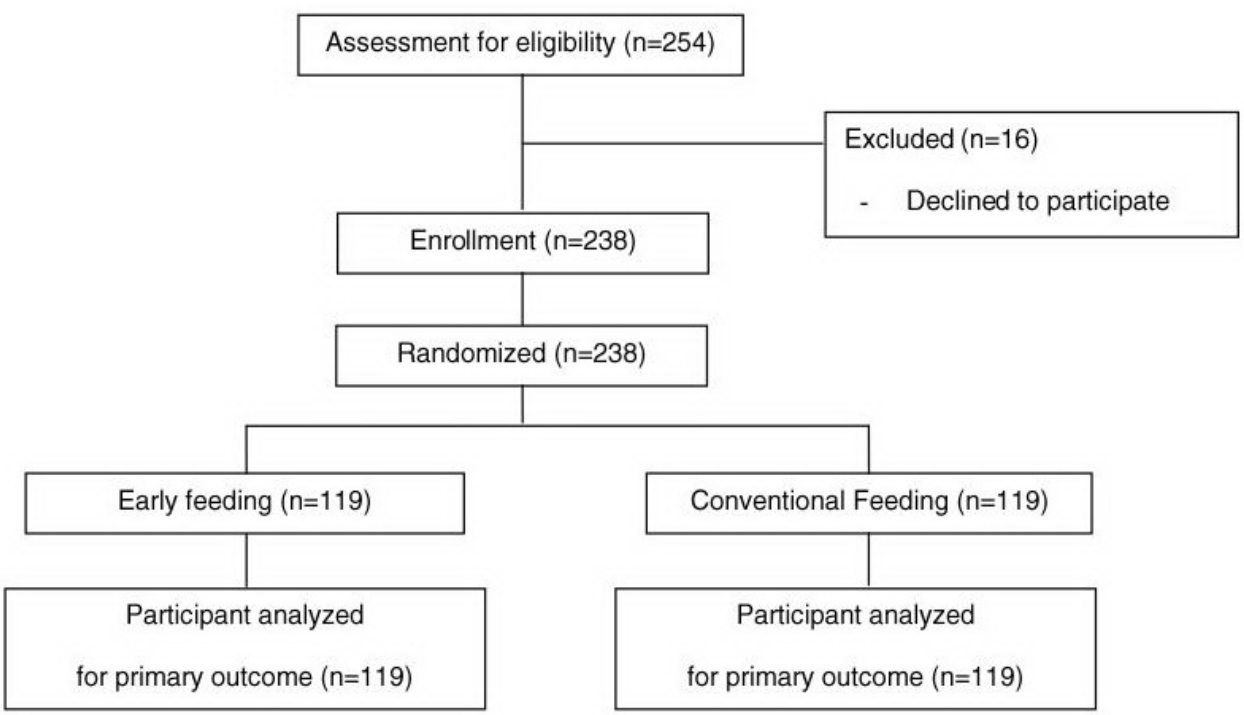

Fig. 1. Participants flow.

Baseline characteristics were presented in Table 1. Age, parity, breastfeeding experience, BMI were similar in both groups. The most common indication for cesarean section was cephalopelvic disproportion, 50 (42%) in early feeding and 59 (49.6%) in conventional feeding group. The other indications were previous cesarean section, failed induction of labor, abnormal presentation and placenta previa with labor. Mean of preoperative withhold diet time was similarly in both groups (11.8 hours and 11 hours in early feeding and conventional feeding group, respectively). There was no different in operation time, intraoperative blood loss, pre and postoperative hematocrit level between both groups. No serious intraoperative and postoperative complications were found. Neonatal birth weight and Apgar scores were not different between group. Few cases in both groups had mild degree of nipple sores that corrected when changed position and latched on of breastfeeding by lactating nurse.

Table 1. Demographic characteristics in early and conventional feeding.

Characteristics	Early feeding (n = 119)	Conventional feeding (n = 119)	p value
Age (years), mean (SD)	28.1 (5.9)	28.2 (6.3)	0.96
Primiparous, n (%)	50 (42)	42 (35.2)	0.28
Breastfeeding experience, n (%)	69 (57.9)	77 (64.7)	0.28
BMI > 30 kg/m^2, n (%)	32 (26.8)	54 (45.3)	0.26
Indication for cesarean section, n (%)			0.51
Cephalopelvic disproportion	50 (42)	59 (49.6)	
Previous cesarean with labor	48 (40.3)	48 (40.3)	
Failed induction	3 (2.5)	1 (0.8)	
Abnormal presentation	15 (12.6)	10 (8.4)	
Placenta previa with labor	3 (2.5)	1(0.8)	
Pre-operative withhold diet (hours), mean (SD)	11.8 (4.1)	11 (4)	0.1
Hematocrit (%), mean (SD)			
Preoperative	36.2 (3.7)	36.3(3.5)	0.89
Post-operative	36 (3.3)	36.6(3.8)	0.21
Birth weight (grams), mean (SD)	3160.4 (414.3)	3251.6 (448.8)	0.13
APGAR at 1 min, mean (SD)	8.8 (0.5)	8.7 (0.5)	0.23

BMI: Body mass index, SD: Standard deviation

The primary outcome was maternal perception of OL. The current study found significance earlier OL in early feeding compare to conventional feeding group (30.1 ± 12.9 hours and 46.3 ± 10.8 hours, respectively, $p < 0.01$). The earliest and longest OL were at 6 hours and 62 hours in early feeding group while at 18 hours and 68 hours in conventional feeding group. The early feeding group had OL mostly within Day 1 and 2 while the conventional group had OL mostly within Day 2 and 3 postpartum. There was no delay OL (OL > 72 hrs) in both groups (Table 2). Cumulative incidence of OL in early feeding group was higher than conventional feeding group during the study period (Fig. 2).

Gastrointestinal outcomes were divided into

mild and severe bowel ileus. Mild symptoms of bowel ileus (anorexia and nausea) was 14 (11.8%) in early feeding group and only 5 (4.2%) in conventional feeding group with no statistical significance. Severe bowel ileus including vomiting, need to retain nasogastric tube or abdominal radiography were not found in the present study. All of them ambulated in first 24 hours. Early feeding group had earlier ambulation and shorter length of stay than conventional feeding group with statistical significance. There was no excessive infant weight loss (> 10% of birth weight) and neonatal jaundice were found in this study (Table 3).

Table 2. Onset of lactation between early and conventional feeding.

Onset of lactation	Early feeding (n= 119)	Conventional feeding (n= 119)
By mean (SD), hours	30.1 (12.9)	46.3 (10.8)
By min-max, hours	6-62	18-68
By day of postpartum		
Day 1	58 (48.7)	7 (5.9)
Day 2	45 (37.8)	58 (48.7)
Day 3	16 (13.4)	54 (45.3)
> Day 3*	0	0

* Delayed onset of lactation (OL > 72 hours)

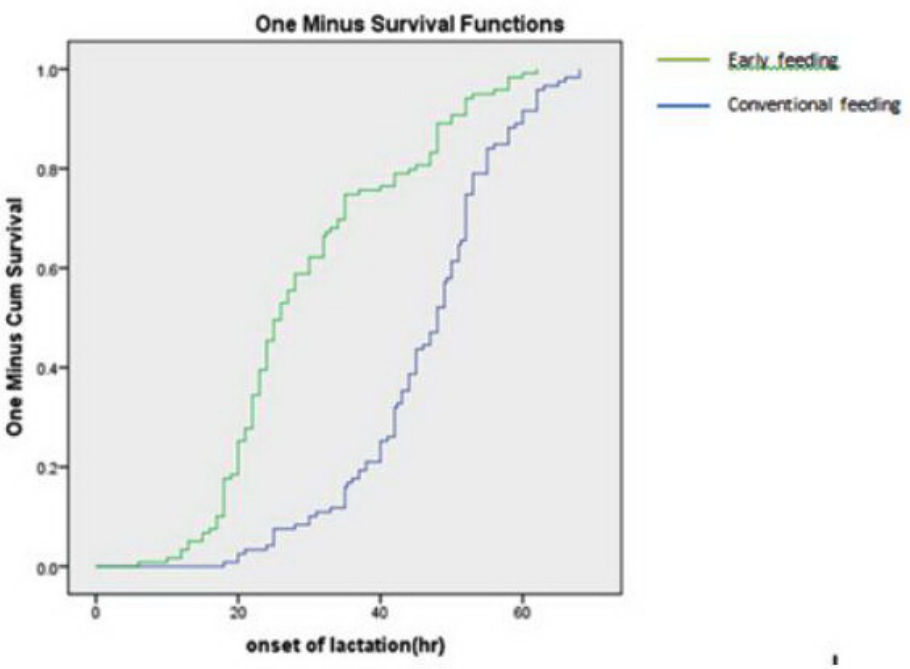

Fig. 1. Participants flow.

Table 3. Gastrointestinal outcomes, onset of ambulation, length of stay between early and conventional feeding.

Variables	Early feeding (n = 119)	Conventional feeding (n = 119)	p value
Bowel ileus, n (%)	14 (11.8)	5 (4.2)	0.07
- Mild	14 (11.8)	5 (4.2)	
- Severe	0	0	
Onset of ambulation (hours), mean (SD)	12.1 (3.8)	14.9 (3.8)	< 0.01
Length of stay (days), mean (SD)	2.6 (0.8)	3.2 (0.6)	< 0.01

Discussion

Maternal perception for OL (breast fullness, breast tingling and milk leakage) is a very useful method for detection of OL because parturient mother could recognize of milk exceed enough to nurse her infant at first time. Moreover, previous study found that postpartum women were able to recall delayed OL even at seven months postpartum with high sensitivity and acceptable specificity (93.6% and 62.5% respectively)[10]. In addition, maternal perception of OL can apply in general, especially in low resource settings.

OL as the primary outcome in the present study, it showed OL in early feeding group had 16 hours earlier when compared to conventional feeding group with statistical significance (30.1 ± 12.9 hours and 46.3 ± 10.8 hours, respectively). OL in conventional feeding in emergency cesarean section in the current study was similar to the previous study[11]. Nearly half of mothers (48.4%) in early feeding group had OL within the first day of postpartum while conventional feeding group found only 5.8%, it was approximately 8 times earlier. OL in conventional feeding mostly (48.4%) occurred in the second day of postpartum. The cumulative incidence of OL in early feeding group was higher than conventional group at all study periods (Fig. 2). These finding confirmed that early feeding in emergency cesarean parturient mothers had a significant benefit in promoting earlier OL. Delayed OL (OL > 72 hrs) could affect to the neonate by excessive neonatal weight loss (> 10 percent of birth weight) which caused dehydration, electrolyte imbalance or even neonatal death[3]. Mothers who had delayed OL decreased breastfeeding rate and duration of breastfeeding[12]. Factors affected delayed OL included primigravida, obesity, diabetes, stress and cesarean section[8]. Delayed OL was found in both elective and emergency cesarean section[4, 11]. However, there was no delayed OL in early feeding group in one study with uncomplicated cesarean section while 11.1% of delayed OL had found in conventional feeding[9]. Surprisingly, delayed OL was not found in the current study even in conventional feeding group and no excessive neonatal weight loss and breastfeeding jaundice detected. It might be explained by proper breastfeeding support and adequate postoperative pain control could help mothers in early initiating of breastfeeding and nursing her infant. According to cesarean section rate has tendency to increase worldwide[13], we hope that early feeding in emergency cesarean parturient mothers could be one of the best choices to promote early breast milk production followed by increasing in rate and duration of breastfeeding.

Breastfeeding and taking care of baby all day and night, post cesarean parturient mothers seems to have more energy from early diet than those of other uncomplicated abdominal surgeries. Early feeding in post cesarean mother had more energy than conventional feeding in 7-10 day postpartum due to early feeding of regular diet[14]. Several studies started early feeding in post elective cesarean mothers in various times range from thirty minutes to eight hours without significant serious gastrointestinal

outcomes[7, 8, 15]. Moreover, one study showed early feeding had lesser bowel ileus symptoms than conventional feeding[8]. Postoperative early feeding is safe and well tolerate because cesarean section is uncomplicated operative technique, short operative time than other abdominal surgeries and less bowel interference. However, we decided to start early feeding at 6 hours postoperation because the study was conducted in emergency cesarean section that might have a chance of inadequate withhold diet and caused aspiration. The present study found only mild symptoms of bowel ileus higher in early feeding compare to conventional feeding group (11.7% and 4.2%, respectively) but there was no statistical significant. There was no serious gastrointestinal outcome in this study.

In this study, early feeding had earlier ambulation and shorter length of hospital stay similar to others[7, 15]. Spinal block with intrathecal opioid provides a long period of postoperative analgesia for 24 hours. Thus, the mothers in this study had earlier time to ambulate in both early and conventional group compare to spinal block without intrathecal opioid in other studies[7, 8].

The strength of this study was the first randomized controlled trial about OL and feeding types in emergency cesarean parturient mothers. The limitation of this study was OL and maternal confidence of breastfeeding before and after OL was not evaluated. OL in emergency cesarean parturient mothers under general anesthesia should be taken into account for the further study.

Conclusion

In conclusion, early feeding in emergency cesarean parturient mothers had a significant earlier onset of lactation when compare with conventional feeding without serious adverse gastrointestinal outcomes.

Potential conflicts of interest

The authors declare no conflict of interest.

References

1. Chapman DJ, Perez-Escamilla R. Maternal perception of the onset of lactation is a valid public health indicator of lactogenesis stage II. J Nutr 2000;130:2972-80.
2. Perez-Escamilla R, Chapman DJ. Validity and public health implication of maternal perception of the onset of lactation. J Nutr 2001;131:3021S-4S.
3. Dewey KG, Nommsen Rivers LA, Heinig MJ, Cohen RJ. Risk factors for suboptimal infant breastfeeding behaviour, Delayed onset of lactation and excess neonatal weight loss. Pediatrics 2003;112:607-19.
4. Jeerasap R, Phaiboonbunpot N, Panikom S. Routes of delivery and onset of lactation. J Health Sci 2010;19:270-8.
5. Chien Ly, Tai CJ. Effects of delivery method and timing of breastfeeding initiation on breastfeeding outcomes in Taiwan. Birth 2007;34:123-30.
6. Butte NF, Garza C, Smith EO, Nichols BL. Human milk intake and growth in exclusively breast-fed infants. J Pediatr 1984;104:187-95.
7. Izbizky GH, Minig L, Sebastiani MA, Otan L. The effect of early versus delayed postcaesarean feeding on women's satisfaction: a randomized controlled trial. BJOG 2008;115:332–8.
8. Chantrasorn V, Tannirandorn Y. A comparative study of early post-operative feeding versus conventional feeding for patients undergoing cesarean section: a randomized controlled trial. J Thai Assoc Thai 2006;89:S11-6.
9. Deawvatanavivat N. The onset of lactation after an uncomplicated cesarean delivery: a randomized controlled study between early post-operative feeding and conventional feeding. Thai J Obstet Gynaecol 2010;18:70-6.
10. Chapman DJ, Perez-Escamilla R. Identification of risk factors for delayed onset of lactation. J Am Diet Assoc 1999;99:450-4.
11. Intarasukum P. Onset of lactation after an uncomplicated cesarean delivery: a study between emergency cesarean delivery and elective cesarean delivery. J Health Sci 2014;23:1058-66.
12. Hruschka DJ, Sellen DW, Stein AD, Martorell R. Delayed onset of lactation and risk of ending full breastfeeding early in rural Guatemala. J Nutr 2003;133:2592-9.
13. World Health Organization. WHO statement on caesarean section rates executive summary. Reprod Health Matters 2015;23:149-50.
14. Malhotra N, Khanna S, Pasrija S, Jain M, Agarwala RB. Early oral hydration and its impact on bowel activity after elective cesarean section – our experience. Eur J Obstet Gynecol Reprod Biol 2005;120:53-6.
15. Teoh WH, Shah MK, Mah CL. A randomised controlled trial on beneficial effects of early feeding post-Caesarean delivery under regional anaesthesia. Singapore Med J 2007;48:152-7.