



## EARLY VERSUS DELAYED ORAL POSTOPERATIVE FEEDING AFTER CESAREAN SECTION

Yasmeen K.M.L. Dabees\* ; Mohamed M. Abd Al Rahman; Gamal G.  
Yousef; Tarek E. and Ahmed H. Abdelaal

Article History: Received: 27.03.2023

Revised: 28.04.2023

Accepted: 02.05.2023

### Abstract

**Background:** Cesarean section continues to be the most common surgical delivery procedure. Until recent years, oral fluids were not given until at least 8-h post-cesarean surgery. With changing surgical attitudes, however, the benefits of early oral feeding, especially after cesarean section, are being reconsidered.

**Aim:** The present randomized clinical trial was aiming to evaluate the outcomes of early feeding (6 hours after operation) versus delayed oral maternal feeding (Withholding food until appearance of intestinal sounds/ bowel movements (Traditional feeding)) after cesarean section under regional anesthesia.

**Methods:** Forty patients were randomly allocated to one of two groups; the early feeding group and the traditional feeding group (20 patients for each group). Patients included in the study were 18-40 years old, cesarean section was performed for all cases in the Pfannenstiel-Kerr method under regional anesthesia. All of the patients were with singleton pregnancy with gestational age 38–42 weeks and stable vital signs. Patients with intraoperative complications such as bowel or bladder injury, more than 1000 ml blood loss during operation and patients using magnesium sulfate were excluded from the study. Patients with history of bowel surgery and history of maternal medical diseases were also excluded from the study. The 40 patients underwent elective cesarean section, of which 20 patients started oral feeding 6 hours after operation (early feeding). It included clear fluids and a soft diet of boiled vegetables. The other 20 patients withheld oral feeding until the appearance of intestinal sounds / bowel movements (delayed feeding). The timing of oral feeding was assigned randomly in an equal matter to the 40 patients. During hospitalization, onset of bowel movement, abdominal distension, time to passage of flatus and time of defecation were assessed. Gastrointestinal symptoms and women's satisfaction were asked about. Time of mobilization was recorded.

**Result(s):** Women who received early feeding was significantly more satisfied than delayed feeding group. Ambulation was earlier in early feeding women with range (4 – 5) compared to (6 – 9) for delayed feeding group. There were significant strong direct correlations between time of pass flatus and both time of first defecation and time of first normal diet, also there was a significant weak correlation between time of pass flatus and time of ambulation.

**Conclusion:** Early postoperative oral feeding in caesarian section is safe compared with delayed postoperative oral feeding.

**Keywords:** Cesarean section, anesthesia, cesarean delivery, postoperative ileus.

Department of Obstetrics and Gynecology, Faculty of Medicine, 6 October University

\*Corresponding Email: yasmeendabees95@gmail.com

### 1. INTRODUCTION

Cesarean section is a fetal delivery through an open abdominal incision (laparotomy) and an incision in the uterus (hysterotomy). The first cesarean documented occurred in 1020 AD, and since then, the procedure has evolved tremendously. It is the most common surgery performed in the United States, with over 1 million women delivered by cesarean every year<sup>(1)</sup>.

Until recent years, patients were not allowed to get oral intake of fluids after cesarean at least 8 hours. This thinking is due to some complications such as nausea, vomiting and abdominal distension (which may be occurs following oral feeding before bowel function), can lead to wound dehiscence, anastomotic complications or aspiration. But with the changing attitudes of surgeons, early oral feeding after abdominal surgery, especially cesarean section, has been considered<sup>(2)</sup>.

Early feeding reduced the rate of body protein depletion, improves wound healing and has positive impact on psychological status of patients and reduced the length of hospital stay and incidence of nosocomial infections and the treatment costs<sup>(3)</sup>.

Because the majority of cesarean surgery is performed under regional anesthesia with low intestinal manipulation and most of the patients are young, some researchers believe that women had undergone cesarean section can receive their usual diet 4-8 hours after surgery.<sup>(4)</sup>

**Aydin et al.**<sup>(5)</sup> evaluated the effects of early oral feeding on time of ambulation, length of hospitalization and determined the impact of early feeding on the development of complications such as wound infection and gastrointestinal symptoms in patients with elective cesarean delivery. With regard to postoperative recovery and early hospital discharge after cesarean delivery, regional anesthesia and early oral feeding encouraged 2 hours after the operation should be recommended.

The aim of the present study is to assess the benefit of early versus late postoperative CS oral feeding.

## 2. PATIENTS AND METHODS

This study was done at October 6 University Hospital on 40 pregnant female patients that are medically free.

### Inclusion criteria:

1. Age between 18 and 40 years old.
2. Cesarean section performed for all cases in the Pfannenstiel-Kerr method.
3. Regional anesthesia.
4. Singleton pregnancy with gestational age 38–42 weeks.
5. Stable vital signs.
6. Preoperative hemoglobin level equal or more than 9 gm/dl.
7. Eligible for oral feeding after surgery.

### Exclusion criteria:

1. Intraoperative complications such as bowel or bladder injury, more than 1000 ml blood loss during operation.
2. Use of magnesium sulfate for maternal or fetal indications.
3. History of GIT disease/ surgery or intraoperative GIT injury.
4. Vaginal delivery.
5. Cesarean section due to a medical emergency.
6. History of maternal medical diseases.
7. Marked postoperative anemia (hemoglobin less than 9 gm/dl).
8. Need for postoperative blood transfusion.

### Methods:

Cases who fulfil the inclusion criteria were randomized into two groups by 1:1 ratio method, the early feeding group (20 cases) and the traditional feeding group (20 cases).

Written informed consent was obtained from the study patients after explaining the purpose and benefits of the study. All cases were subjected to the following:

- Complete history taking.
- General and local examination.

Patients were obtained from the Outpatient Clinic at October 6 University. The 40 patients underwent elective cesarean section, of which 20 patients started oral feeding 6 hours after operation. It included clear fluids and a soft diet of boiled vegetables, the other 20 patients with held oral feeding until the appearance of intestinal sounds / passage of flatus. The timing of oral feeding was assigned randomly in an equal matter to the 40 patients.

Then, patients were visited by the researcher every two hours during hospitalization:

- To assess onset of bowel movement symptoms.
- To assess abdominal distention, time to passage of flatus and time of defecation.
- To ask about gastrointestinal symptoms such as nausea and vomiting.
- To record time of mobilization.
- To ask about women's satisfaction.

If there is evidence of ileus, patients were treated with intravenous fluids, limitation of oral intake and nasogastric suction, if necessary.

### STATISTICAL ANALYSIS:

All data were analyzed using SPSS 18.0 for windows (SPSS Inc., Chicago, IL, USA). Continuous variables were expressed as the mean  $\pm$  SD & median (range), and the categorical variables were expressed as a number (percentage). Continuous variables were checked for normality by using Shapiro-Wilk test. A backward multivariate linear regression analysis was performed to determine explanatory factors of selected post-operative outcomes.  $p < 0.05$  was considered statistically significant (S),  $p < 0.01$  was considered highly statistically significant (HS), and  $p \geq 0.05$  was considered non statistically significant (NS).

## 3. RESULTS

The present study included 40 post cesarean women. Their age and BMI were presented in table (1) showing that both groups were comparable regarding age (mean, 27 versus 27.1 years,  $p = 0.94$ ) and BMI (mean, 28 versus 27.8,  $p = 0.45$ ).

Table (2) revealed that there was no significant difference between the studied groups as regard number of previous operations, also there was no significant difference as regard duration of preoperative fasting, and finally there was no significant difference between the studied groups as regard type of cesarean section.

In table (3), as regard the GIT patterns, early feeding group has intestinal sound return more earlier with mean value of 6.5 hours compared to 8.2 hours for

delayed feeding group ( $p < 0.001$ ), also early feeding group passed flatus earlier with a median value of 12 hours compared to 14 hours for delayed feeding group ( $p < 0.001$ ), and early feeding group defecated earlier with a median value of 16 hours compared to 24 hours for delayed feeding group ( $p < 0.001$ ). Consequently, the early feeding group was less likely to receive laxative than delayed feeding group (85% versus 60%,  $p = 0.02$ ).

Table (4) revealed that early feeding group received first normal diet earlier than delayed feeding group with median of 13.5 hours compared to 17 hours for delayed feeding group ( $p < 0.001$ ). 15% of women in delayed feeding group had abdominal distension in comparison to 5% in early feeding group ( $p = 0.06$ ). Consequently, abdominal cramps occurred more frequently in delayed feeding group than early feeding group (10% versus 5%,  $p = 0.09$ ).

Table (5) concluded that women who received early feeding was significantly more satisfied than delayed feeding group (80% versus 50%,  $p < 0.001$ ). Furthermore, ambulation was earlier in early feeding women with range of 4-5 compared to 6-9 for delayed feeding group ( $p < 0.001$ ).

Figures (1, 2 and 3) revealed that there was a significant strong direct correlation between time of pass flatus and both time of first defecation and time of first normal diet, also there was a significant weak correlation between time of pass flatus and time of ambulation.

Table (6) showed that there was a significant strong direct correlation between time of defecation and both time of flatus passage and time of first normal diet. Table (7) clarified that there was a significant strong direct correlation between time of first normal diet and both time of defecation and time of flatus passage.

**Table (1): Demographic Characteristics of Patients in The Study Groups**

Demographic characteristics	Early feeding (n = 20)	Delayed feeding (n = 20)	MW	p-value
<b>Age (years)</b>				
Mean $\pm$ SD	27 $\pm$ 4.5	27.1 $\pm$ 4.8	-0.08	0.94 (NS)
Median (range)	27.5 (20-34)	25 (20-35)		
<b>BMI (kg/m<sup>2</sup>)</b>				
Mean $\pm$ SD	28 $\pm$ 2.8	27.8 $\pm$ 2.9	-0.76	0.45 (NS)
Median (range)	28 (23-34)	27 (24-34)		

MW: Mann Whitney U test;  $p < 0.05$  is significant.

**Table (2): Operation Characteristics of Patients in The Study Groups**

Operation characteristics	Early feeding (n = 20)	Delayed feeding (n = 20)	Test	p-value
<b>Number of previous operations</b>				
Mean $\pm$ SD	2 $\pm$ 1.1	2 $\pm$ 1.1	MW = -1.1	0.3 (NS)
Median (range)	2 (1-4)	2 (1-4)		
<b>Duration of preoperative fasting (hours)</b>				
Mean $\pm$ SD	10.8 $\pm$ 3.1	10.9 $\pm$ 3	MW = -0.44	0.66 (NS)
Median (range)	11.5 (4-16)	12 (3-15)		
<b>Type of CS</b>				
Urgent	4 (20%)	4 (20%)	X <sup>2</sup> = 0.49	0.78 (NS)
Scheduled	6 (30%)	7 (35%)		
Elective	10 (50%)	9 (45%)		

MW: Mann Whitney U test; X<sup>2</sup>: Chi-square test;  $p < 0.05$  is significant,

**Table (3):** Bowel Motility of Patients in The Study Groups

Bowel motility	Early feeding (n = 20)	Delayed feeding (n = 20)	Test	p-value
<b>Time of intestinal sound return (hours)</b>				
Mean ± SD	6.5 ± 1.7	8.2 ± 2.5	MW = -4.37	< 0.001 (HS)
Median (range)	6 (3-10)	8 (3-15)		
<b>Time of flatus passage (hours)</b>				
Mean ± SD	12.8 ± 6.5	18.1 ± 9.5	MW = -3.62	< 0.001 (HS)
Median (range)	12 (4-30)	14 (6-48)		
<b>Time of first defecation (hours)</b>				
Mean ± SD	17.2 ± 10.4	25.1 ± 12.2	MW = -4.24	< 0.001 (HS)
Median (range)	16 (4-52)	24 (8-56)		
<b>Laxative intake</b>				
Not taken	17 (85%)	12 (60%)	X <sup>2</sup> = 15.01	0.02 (S)
One dose	2 (10%)	4 (20%)		
Two doses	1 (50%)	4 (20%)		
Three doses	0 (0%)	0 (0%)		

MW: Mann Whitney U test

X2: Chi-square test

p < 0.05 is significant

HS: Highly Significant

S: Significant

**Table (4):** GIT Findings of Patients in The Study Groups

GIT findings	Early feeding (n = 20)	Delayed feeding (n = 20)	Test	p-value
<b>Time of the first normal diet (hours)</b>				
Mean ± SD	13.7 ± 3.3	18 ± 7.6	MW = -4.98	< 0.001 (HS)
Median (range)	13.5 (8-20)	17 (9-55)		
<b>Nausea</b>				
No	19 (95%)	18 (90%)	X <sup>2</sup> = 2.82	0.09 (NS)
Yes	1 (5%)	2 (10%)		
<b>Vomiting</b>				
No	20 (100%)	20 (100%)	X <sup>2</sup> = 2.03	0.16 (NS)
Yes	0 (0%)	0 (0%)		
<b>Abdominal distension</b>				
No	19 (95%)	17 (85%)	X <sup>2</sup> = 3.66	0.06 (NS)
Yes	1 (5%)	3 (15%)		
<b>Cramps</b>				
No	19 (95%)	18 (90%)	X <sup>2</sup> = 2.82	0.09 (NS)
Yes	1 (5%)	2 (10%)		

MW: Mann Whitney U test

X<sup>2</sup>: Chi-square test

p < 0.05 is significant

HS: Highly Significant

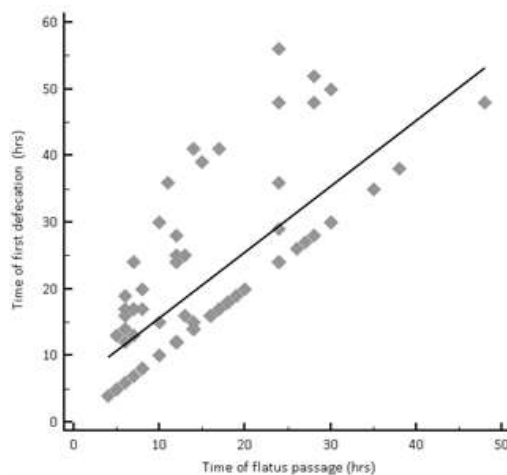
NS: Non Significant

**Table (5):** Post-Cesarean Outcome of Patients in The Study Groups

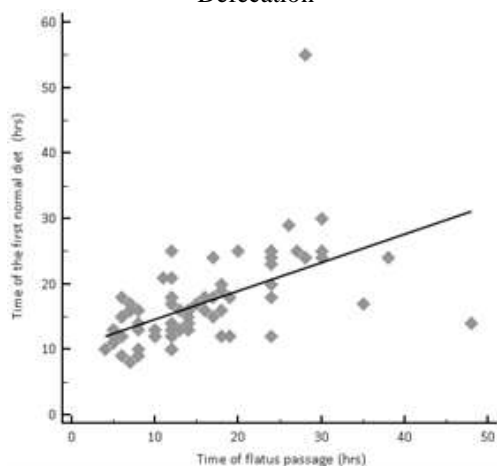
Post-cesarean outcome	Early feeding (n = 20)		Delayed feeding (n = 20)		X <sup>2</sup>	p-value
	No	%	No	%		
<b>Satisfaction</b>						
No	4	20	10	50	15.82	< 0.001 (HS)
Yes	16	80	10	50		
<b>Time of the beginning of ambulation (hours)</b>						
Mean ± SD	4 ± 0.4		8 ± 1		-11.57	< 0.001 (HS)
Median (range)	4 (4-5)		8 (6-9)			

MW: Mann Whitney U test  
X2: Chi-square test

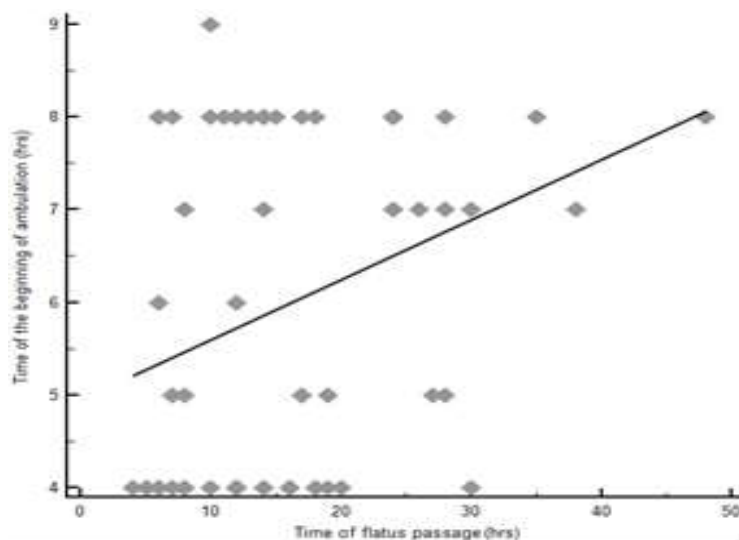
p < 0.05 is significant.  
HS: Highly Significant



**Figure (1):** Scatter Plot with Regression Line Shows Correlation Between Time of Flatus Passage and Time of Defecation



**Figure (2):** Scatter Plot with Regression Line Shows Correlation Between Time of Flatus Passage and Time of the First Normal Diet



**Figure (3):** Scatter Plot with Regression Line Shows Correlation Between Time of Flatus Passage and Time of Ambulation (Hours)

**Table (6):** Correlation Between Time of First Defecation (Hours) And Some Selected Parameters

Variables	All studied parameters (n = 40)		Early feeding group (n = 20)		Delayed feeding group (n = 20)	
	r	p	r	p	r	p
Age (years)	0.03	0.75 (NS)	0.09	0.44 (NS)	-0.07	0.57 (NS)
BMI (kg/m <sup>2</sup> )	-0.02	0.77 (NS)	0.24	0.03 (S)	-0.29	0.01 (S)
Parity	0.13	0.1 (NS)	0.13	0.24 (NS)	0.1	0.36 (NS)
Gestational age (weeks)	-0.1	0.23 (NS)	0.08	0.49 (NS)	-0.22	0.04 (S)
Duration of fasting (hours)	0.06	0.48 (NS)	0.1	0.36 (NS)	0.05	0.66 (NS)
Operation number	0.13	0.1 (NS)	0.13	0.25 (NS)	0.16	0.15 (NS)
Time of flatus passage (hours)	0.68	< 0.001 (HS)	0.65	< 0.001 (HS)	0.62	< 0.001 (HS)
Time of first normal diet (hours)	0.65	< 0.001 (HS)	0.61	< 0.001 (HS)	0.59	< 0.001 (HS)
Time of ambulation (hours)	0.39	< 0.001 (HS)	0.33	0.03 (S)	0.14	0.23 (NS)

r: Spearman's rank correlation coefficient  
 HS: Highly Significant  
 S: Significant

NS: Non Significant  
 p < 0.05 is significant

**Table (7):** Correlation Between Time of First Normal Diet (Hours) And Some Selected Parameters

Variables	All studied parameters (n = 40)		Early feeding group (n = 20)		Delayed feeding group (n = 20)	
	r	p	r	p	r	p
Age (years)	-0.04	0.64 (NS)	-0.02	0.85 (NS)	-0.04	0.76 (NS)
BMI (kg/m <sup>2</sup> )	-0.001	0.99 (NS)	0.17	0.1 (NS)	-0.18	0.12 (NS)
Parity	0.12	0.15 (NS)	0.09	0.5 (NS)	0.18	0.1 (NS)
Gestational age (weeks)	-0.1	0.13 (NS)	0.03	0.8 (NS)	-0.27	0.02 (S)
Duration of fasting (hours)	0.08	0.3 (NS)	-0.01	0.91 (NS)	0.22	0.04 (S)
Operation number	0.07	0.39 (NS)	0.1	0.4 (NS)	0.09	0.41 (NS)
Time of flatus passage (hours)	0.63	< 0.001 (HS)	0.64	< 0.001 (HS)	0.52	< 0.001 (HS)
Time of first defecation (hours)	0.65	< 0.001 (HS)	0.61	< 0.001 (HS)	0.59	< 0.001 (HS)
Time of ambulation (hours)	0.33	< 0.001 (HS)	0.18	0.12 (NS)	-0.07	0.56 (NS)

r: Spearman's rank correlation coefficient  
 p < 0.05 is significant.  
 HS: Highly Significant

S: Significant  
 NS: Non Significant

#### 4. DISCUSSION

Cesarean delivery is the most common surgical procedure for women that have increasing rate in the world. Oral feeding has a major impact on improving of beginning of normal bowel function after operation. After an uncomplicated surgery, liquid diet can be given on one day after operation; and after return of bowel function and flatus passing, the normal diet for patients can be initiated (1). With the changing attitudes of surgeons, early oral feeding after abdominal surgery, especially cesarean section, has been considered (2).

The present randomized clinical trial was aiming to evaluate the outcomes of early (6 hours after operation) versus delayed (Withholding feeding until appearance of intestinal sounds/ passage of flatus (Traditional feeding)) oral maternal feeding after cesarean section under regional anesthesia.

Fourty patients were randomly allocated to one of two groups; the early feeding group and the traditional feeding group (20 patients for each group). Patients included in the study were 18-40 years old, cesarean section was performed for all cases in the

Pfannenstiel-Kerr method under regional anesthesia. All of the patients were with singleton pregnancy with gestational age 38-42 weeks and stable vital signs.

In the early feeding group, 6 hours after surgery, patients received clear fluids and a diet of soft boiled vegetables. In the traditional feeding group (withholding feeding until appearance of intestinal sounds or passage of flatus) patients received clear fluids and the same diet of soft boiled vegetables.

Early feeding group have intestinal sounds return more earlier with mean value of 6.5 hours compared to 8.2 hours for delayed feeding group, also early feeding group passed flatus earlier with a median value of 12 hours compared to 14 hours for delayed feeding group, and early feeding group defecated earlier with a median value of 16 hours compared to 24 hours for delayed feeding group consequently early feeding group was less likely to receive laxative than delayed feeding group.

Early feeding group received first normal diet earlier than delayed feeding group with median 13.5 hours compared to 18 hours for delayed feeding group. Furthermore, no significant difference between both

groups regarding occurrence of nausea where 10% of women in delayed feeding group had nausea while 5% of women in early feeding group had nausea. 15% of women in delayed feeding group had abdominal distension in comparison to 5% in early feeding group, consequently abdominal cramps occurred more frequently in delayed feeding group than early feeding group.

Our study concluded that women receiving early feeding was significantly more satisfied than delayed feeding group. Furthermore, ambulation was earlier in early feeding women with range (4 – 5) compared to (6 – 9) for delayed feeding group.

The time to initiate oral feeding varied from immediately after operation to eight hours after operation in early feeding manner (6) and 12 to 24 hour in delayed feeding manner (7).

According to our study, similar results were published in the study by **Mulayim et al. (8)**. In their study, women who had undergone cesarean section with regional anesthesia in the two feeding groups (2h vs. 8h after operation) were studied. They showed that women who started early oral feeding return of bowel movements occurred more rapidly than those with delayed feeding. Also, duration of hospitalization significantly was shorter in early feeding group.

In our study, there was significant strong direct correlations between time of pass flatus and both time of first defecation and time of first normal diet, also there was a significant weak correlation between time of pass flatus and time of ambulation. There was a significant weak direct correlation between time of the beginning of ambulation and all GIT parameters (time of flatus passage, first defecation and first normal diet).

**Al-Ghareeb et al. (9)** identified the effect of early oral hydration on post-cesarean outcomes. They concluded that, early oral hydration for women who underwent uncomplicated cesarean section under regional anesthesia had benefits on return of bowel sounds and motility, early resuming to regular diet, decreasing the duration of intravenous fluid administration, early ambulation, shorter median time of initiation of breast feeding and it shortened the length of hospital stay which consequently affect on hospital cost than the conventional IV regimen.

**Jalilian et al. (10)** compared the outcomes of early and traditional oral feeding after cesarean sections. They concluded that early oral feeding given 2 hours after cesarean section has positive impact to reduce time to return normal bowel function with no significant effect on gastrointestinal complications.

**Masood et al. (11)** compared the effects of two maternal feeding policies-early versus conventional oral feeding-after cesarean delivery. They concluded that early oral dietary initiation after cesarean delivery resulted in early ambulation, greater maternal satisfaction, and reduced length of hospital stay, with no detrimental outcomes.

## 5. CONCLUSION

Early oral feeding given 6 hours after cesarean section has positive impact to reduce time to return normal bowel function with no significant effect on gastrointestinal complications compared with delayed oral feeding (withholding feeding until appearance of intestinal sounds/ passage of flatus) after cesarean section, as early oral hydration had benefits on return of bowel sound and motility, ambulation, breast feeding and resuming regular diet, decreasing duration of IV fluid administration and shortened hospital stay than the conventional IV regimen. So, we can conclude that the early postoperative oral feeding in caesarian section is safe compared with delayed postoperative oral feeding.

## 6. REFERENCES

1. **Sung S, Mahdy H.** Cesarean section. StatPearls [Internet], 2021.
2. **Mulayim B.** Early oral hydration after cesarean delivery performed under regional anesthesia: European Journal of Obstetric and Gynecology 2008; 101: 273.
3. **Gocmen A, Gocmen M, Saraoglu M.** Early post-operative feeding after caesarean delivery. J Int Med Res 2002; 30(5):506-11.
4. **Patolia DS, Hilliard RL, Toy EC.** Early feeding after cesarean: randomized trial. Obstet Gynecol. 2001; 98(1): 113-6.
5. **Aydin Y, Altunyurt S, Oge T.** Early versus delayed oral feeding after cesarean delivery under different anesthetic methods: A randomized controlled trial in anesthesia, and feeding in cesarean delivery. Ginekol Pol 2014; 85: 815-822.
6. **Teoh WH, Shah MK, Mah CL.** A randomised controlled trial on beneficial effects of early feeding post-Caesarean delivery under regional anesthesia. Singapore Med J. 2007; 48(2): 152-7.
7. **Kovavisarach E, Atthakorn M.** Early versus delayed oral feeding after cesarean delivery. Int J Gynaecol Obstet 2005; 90: 31-34.
8. **Mulayim B, Celik NY, Kaya S.** Early oral hydration after cesarean delivery performed under regional anesthesia. Int J Gynaecol Obstet 2008; 101(3): 273-6.
9. **Al-Ghareeb SA, Ahmad ER and Turki HA.** Effect of Early Oral Hydration on Post Cesarean Outcomes. Journal of American Science 2013;9(8): 70-78.
10. **Jalilian N, Fakhri M and Keshavarzi F.** A randomized clinical trial to compare the post-operative outcomes of early vs. late oral feeding after Cesarean section. Life Science Journal 2013;10(8s): 212-215.
11. **Masood SN, Masood Y, Naim U.** A randomized comparative trial of early initiation of oral maternal feeding versus conventional oral feeding after cesarean delivery. Int J Gynaecol Obstet. 2014; 126(2): 115-9.