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Review article

Does coffee affect the bowel function after caesarean section?

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ABSTRACT

Objectives: Postoperative ileus is a common consequence of abdominal surgery, which tends to prolong the duration of hospital stay and imposes considerable economic costs on healthcare system. Coffee is proved to have positive effects on gastrointestinal motility index in healthy young adults. Thus, the present study aims to examine effects of coffee on bowel function after caesarean section.
Material and method: A total number 100 patients after elective caesarean section were randomly assigned before surgery into control and intervention groups. The intervention group received 100cc coffee at 8, 12 and 20 h after the surgery, while the control group received 100cc hot water at the same intervals. First bowel sound, first passage of flatus, first defecation, and length of stay after surgery were compared in the two groups.
Findings: Mean time to first flatus passage was recorded in the control (22.54 ± 5.09 h) and intervention (17.28 ± 4.44 h) groups and showed to be statistically significant ($p = -0.000$). However, average time of first defecation (intervention 37.22 ± 16.31 h; control 36.82 ± 16.5 h; $p = 0.647$) and mean time of hospital stay of patients (intervention 30.08 ± 9.50 h; control 32.16 ± 11.82 h; $p = 0.518$) and first bowel sound (intervention 5.84 ± 1.41 h; control 6.16 ± 1.33 h; $p = -0.326$) were not statistically significant.
Discussion: Drinking coffee after a caesarean section reduces time to first flatus in patients. Nevertheless, further studies are needed to examine effects of coffee on ileus after elective caesarean section.

Contents

Introduction

Postoperative care after caesarean section, particularly gastrointestinal system care, is highly important. Ileus is a major gastrointestinal complication following abdominal surgeries that causes impaired intestinal motility and may persist between 2 to 5 days, tending to be longer for serious surgeries. Ileus gives rise to

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many complications and is a primary determinant of post-surgery in-hospital stay [1]. It initiates a variety of symptoms such as abdominal distention, pain, intolerance to oral diet, dependence on parenteral nutrition, inability to breastfeed, and prolongs hospital stay while imposing large economic burden on national healthcare system [2–4].

Caesarean section is a common abdominal surgery showing an increasing trend over the last three decades; for instance, in 2010, caesarean section accounted for 48% of all deliveries in Iran [5]. Moreover, in West Azerbaijan, 42.6 of children were delivered by caesarean section in 2012 [6]. Ileus is a major complication after caesarean section [7] After cesarean, it affects 26%–31% of patients [8] which is prompted by a number of factors including drug interactions, opioids and surgical procedures. As well as the large amount of blood and amniotic fluid shed in the peritoneal cavity during cesarean delivery, Measures is done to clean up the peritoneal cavity in the manipulation of the intestines and ileus after it.

A host of treatments have been used in clinical trials to prevent or alleviate duration of postoperative ileus, including medications for intestinal motility, early feeding and use of liquids a few hours after surgery, physical treatments, early mobilization, avoiding nasogastric tube, and spinal anesthesia [9,10].

Coffee is a popular global drink and positively affects human body including cardiovascular system and central nervous system, and improves one's sense of well-being [10]. However, effects of coffee on gastrointestinal function are rarely studied in the literature. Cohn showed that consumption of coffee in young adults has positive effects on intestinal motility index and improves large intestine movements [11]. Similarly, Muller performed a randomized clinical trial on patients with colectomy surgery and reported that coffee accelerates postoperative bowel movement [12]. Considering worldwide popularity of coffee and its positive effects on intestine performance in the literature, the present study seeks to determine effects of drinking coffee on postoperative intestine performance of elective caesarean patients.

Methodology

The present study is a randomized clinical trial with RCT (IRCT2016112728340N3) registration and code of ethics from Ethics Committee of Urmia University of Medical Sciences. Patients were sampled from Imam Reza Hospital before undergoing caesarean surgery in 2014. The following criteria were considered in qualifying patients as participants of the study: elective caesarean section, willingness to participate, no history of previous abdominal surgery or caesarean section, no history of diseases such as diarrhea, chronic constipation, irritable bowel syndrome, gastro esophageal reflux, no use of laxative a day before the surgery, no chronic use of these drugs, and women undergoing spinal anesthesia. Patients with gastrointestinal complications, respiratory problems and infections that required medicational interventions, and those with surgeries longer than 90 min were excluded from the study.

Sampling

The number of samples was calculated according to a study by Müller et al. Considering the power of 80%, confidence 95% and significant level of 0.05, 50 samples were calculated for each group [12].

A total number of 100 patients were taken by sequential and convenience sampling, and were randomly assigned to control (n = 50) and intervention (n = 50) groups. Patients were divided by their date of hospital admission into two groups. Two sealed envelopes, one containing the word "odd" and the other "even", were given to patients to indicate their date of admission. Those admitted on odd days were assigned to control group and those admitted on even days were assigned to intervention group. This was to avoid physical contact between the two groups for preventing of any disrupts interventions. Objectives of the study were explained to the patient and informed consent was taken from them.

Procedures

For all patients, anesthetic medication was midazolam and Fentanyl lidocaine and for pain relief after surgery Petedine was administered three times a day. Transverse abdominal incision and lower segment uterine incision were made and duration of surgery was no longer than 90 min in all samples. In Imam Reza Hospital, patients are regularly admitted a day before the scheduled elective C-section and abstain from oral food and fluid intake after the regular dinner at 8 pm up to 24 h after the surgery. A clear liquid diet is permitted the next day and is followed, if tolerated, by real food. All elective caesarean operations are performed by the same doctors in the morning shift before 12 p.m.

Intervention

The intervention plan was performed within the first 24 h after the surgery. Administered by the researcher within 10 min, patients drank 100cc sugar-free coffee at 8, 12 and 20 h after the surgery, and the control group drank 100cc hot water at the same intervals. After 24 h, normal hospital diet was allowed. Both groups could have mineral water with no limitation. We used Khachik coffee (10 g per 100cc water) for all the participants, prepared by Beko electric coffee maker. To avoid disrupting patients' treatment, diet and sleeping, this plan was performed within the first 24 h after the surgery in Imam Reza Hospital when patients received no food and liquids.

Data collection

The present study investigates effects of coffee on postoperative ileus after caesarean section. Thus, first bowel sound, first passage of flatus, first defecation and length of stay after surgery were collected from control and intervention groups. Demographic information of patients and length of stay before and after the

Table 1
Comparison of quantitative variables in both intervention and control groups.

variables	Total Mean ± SD	Control group Mean ± SD	Intervention group Mean ± SD	P-value[a]
age	28.34 ± 5.22	28.46 ± 5.35	28.22 ± 5.14	0.820
Operation time (min)	51.92 ± 7.80	51.60 ± 7.52	52.24 ± 8.13	0.710
number of pregnancies	1.92 ± 1.05	2.06 ± 1.28	1.78 ± 0.73	0.610
number of deliveries	0.82 ± 0.91	0.94 ± 1.90	0.7 ± 0.67	0.555
gestational age	38.65 ± 1.35	38.7 ± 1.34	38.6 ± 1.37	0.710
length of preoperative fasting(h)	12.97 ± 1.83	12.84 ± 1.76	13.1 ± 1.9	0.457

[a] *t*-test.

Table 2
Comparison of qualitative variables between the intervention and control groups.

Variables	Category	Total N (%)	Control group N (%)	Intervention group N (%)	P-value[a]
Education	unlettered	10 (10)	4 (8)	6 (12)	0.450
	Diploma or less	76 (76)	37 (74)	39 (78)	
	University	14 (14)	9 (18)	5 (10)	
employment status	jobless	2 (2)	0 (0)	2 (4)	0.153
	Practitioner	98 (98)	50 (100)	48 (96)	
insurance type	Social Security	77 (77)	38 (76)	39 (78)	0.783
	health Service	10 (10)	6 (12)	4 (8)	
	Rural insurance	13 (13)	6 (12)	7 (14)	
cause of caesarean	Maternal causes	60 (60)	29 (58)	31 (62)	0.683
	The causes of fetal	40 (40)	21 (42)	19 (38)	

[a] K_2.

Table 3
compares the average scores first bowel sounds the first passage of flatus and first defecation.

	Control group Mean ± SD	Intervention group Mean ± SD	P-value
The first time bowel sound (hours)	6.16 ± 1.33	5.84 ± 1.41	0.326
The First time flatus passage (hours)	22.54 ± 5.09	17.28 ± 4.44	0.000
The First time defecation (hours)	36.82 ± 16.35	37.22 ± 16.31	0.674

surgery were extracted from patients' records. Previous and present medical history of patients, including cause of caesarean, gestational age, length of surgery, uterine and abdominal incision type were collected by interviews with surgeons as well as from patients' records. Other information including underlying disease, use of drugs, number of pregnancies, number of deliveries, smoking, drinking strong tea, daily use of coffee, time after first flatus passage and defecation, nausea and vomiting, were obtained by interviews with patients. Moreover, following the patient's release from the operating room, all four quadrants of the abdomen were checked every 15 min by a stethoscope to record first bowel sound. The First time flatus and defecation were recorded based on the patient's own statements.

Data analysis

Data analysis was performed by SPSS 16.0 using descriptive statistics tools, including mean, standard deviation and figures. A *t*-test was also used to compare mean values of the two groups. P-values smaller than 0.05 were considered statistically significant.

Results

A number of 50 participants were assigned to each control and intervention group. Demographic information of patients is given in Tables 1 and 2. Qualitative variables of education, employment status, insurance type, cause of caesarean, and quantitative variables of age, length of surgery, number of pregnancies, number of deliveries, gestational age, length of preoperative fasting, and postoperative stay showed no significant differences between the groups.

Using the Kolmogorov test data related to bowel function of the normal distribution, T- test was used so as to compare their.

Table 3 demonstrates subscales of intestinal performance and shows significant difference between two groups in first flatus passage. It also shows that first bowel sound was recorded at 6.16 ± 1.33 h and 5.84 ± 1.41 h for control and intervention groups, respectively, which was statistically insignificant ($p = 0.326$).

The first passage of flatus in intervention group (17.28 ± 4.44 h) occurred 5 h earlier than control group (22.54 ± 5.09 h) and was statistically significant ($p = 0.000$). First defecation was recorded at 37.22 ± 16.31 h for intervention group and at 36.82 ± 16.5 h for control group, showing no significance ($p = 0.647$). Mean postoperative stay in intervention group (30.08 ± 9.50 h) was shorter than control group (32.16 ± 11.82 h) but was not statistically significant ($p = 0.518$). Furthermore, our results indicate that 8% of control group and 10% of intervention group experienced nausea, and relative risk of vomiting was 1.25 in both groups. However, this was not statistically significant ($p = 0.727$).

Results of Mann-Whitney *U* test show no significant difference for first bowel sound between control and intervention groups ($p > 0.05$) but first flatus passage was significantly different ($p < 0.0001$), implying that coffee facilitates and accelerates first flatus passage. First defecation showed no significant difference ($p < 0.05$).

Discussion and conclusion

Caesarean section is a common surgical procedure. Ileus is a common postoperative complication that causes pain and abdominal distention. The present study examines effects of coffee on post-caesarean ileus.

Our results indicate that mean time to first bowel sound was shorter for intervention group than control group but this difference was not significant. However, Muller [12] studied effects of coffee on ileus after colectomy surgery and stated that time of first bowel movement was considerably shortened (60.4 h for intervention group and 70.0 h for control group after the surgery) and this was statistically significant. In our study, first passage of flatus in intervention group occurred 5 h earlier than control group. This is in agreement with the findings of Muller (intervention group: 40.6 h; control group: 46.4 h), and Mohsenzadeh [13] (intervention group: 24.8 h; control group: 30.0 h) who investigated effects of chewing gum on postoperative ileus [14]. Ajuzieogu [15] studied efficacy of chewing gum on postoperative ileus following cesarean section and found that mean time to first flatus was 6 h earlier in intervention group and was statistically significant. It was consistent with our results. Similarly, Akhlaghi et al. examined effects of chewing gum on post-caesarean ileus and

reported that first passage of flatus was faster for experimental group (14 h) than control group (16 h) [16].

The first defecation in our study showed no significant difference in the two groups and is inconsistent with results of Pirik [17] working on effects of tea and coffee on postoperative ileus (the coffee group had a stool at 80.93 while the tea group had a stool at 96.20). This difference may be due to different surgical procedures applied in the two studies.

Moreover, length of hospital stay for intervention and control groups was 30 and 32.16 h, respectively, and showed no significant difference. This was also in agreement with findings of Muller: 10.8 vs. 11.3.

Postoperative nausea and vomiting was observed in both control (8%) and intervention (10%) groups but this difference was not statistically significant and was different with results of Amini [18] who reported that nausea and vomiting were more frequent in early feeding group than control group, 40% vs. 19% (p = 0/012) This difference is probably due to differences in the type of intervention. Nevertheless, Muller showed that intervention group (49 h) began sold diet sooner than control group (55 h). This difference may be due to different surgical procedures applied in the two studies.

Our results indicate that consuming coffee after elective caesarean section contributes significantly to faster restoration of intestinal function. Coffee is a popular drink and can be used as an alternative to postoperative ileus-related complications.

The study faced some limitations as there was no similar study on effects of coffee on post-caesarean ileus. Further, it was limited to first 24 h after the surgery as patients were discharged early, mostly on the second day after surgery. It is suggested that further studies take a larger sample with longer coffee treatment and a different protocol to see its effects on postoperative gastrointestinal function. This study was not blinded, Therefore, it is recommended that similar studies be done just blind.

Disclosure

This study was departmentally funded at Urmia University of Medical Sciences The authors have no conflicts of interest to declare.

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