Original Article

A Study on Instant Ginger Drink Effect in Enhancing Postpartum Breastfeeding in Immediate Post Cesarean Delivery

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Objective: To compare 24-hour breast milk volume after cesarean delivery between postpartum women who receive instant ginger drink every twelve hours with those receiving placebo.

Materials and Methods: Postpartum women, who delivered by cesarean section at gestational age 37 weeks or older, enrolled in the randomized, double-blind controlled trial. The women randomly allocated to receive instant ginger drink or placebo. The test weighing method was used to measure breast milk volume. Statistically compared 24 hour-breast milk volume between two groups (at 48 to 72 hours after delivery) were analyzed.

Results: Seventy postpartum women and their infants were included in the present clinical trial. All women delivered by cesarean section without any post-operative complication and were willing to participate in the study. Baseline characteristics of participants between two groups were not different. Forty-five participants (65.22%) were primiparous. The 24-hour breastmilk volume in 48 to 72 hours after cesarean delivery was not statically different between the two groups. Median of total breastmilk volumes during 48 to 72 hours after delivery in ginger group was 80 mL, while the placebo group was 100 mL (p=0.68). There was no side effect of instant ginger drink in the postpartum women or infants.

Conclusion: Instant ginger drink did not affect breast milk volume in 48 to 72 hours after cesarean delivery.

Keywords: Ginger drink, Breast feeding, Cesarean delivery, Postpartum

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It is well known that breast milk has many benefits for mother and baby. The World Health Organization recommends immediate and exclusive breastfeeding for at least six months after delivery[1]. In Thailand, only 23.1% of infants exclusively breastfed for the first six months, which is lower than the worldwide rate[2]. Nearly half of mothers have problem with insufficient breast milk supply especially in the first seven days after delivery[3]. Moreover, a recent study shows that cesarean section has negative effect on the volume of breast milk[4]. These factors may affect the mothers' confidence and long-term breastfeeding. Many studies attempt to find substances to increase breast milk volume such as supplementary medications. However, there are conflicting data about their safety, making them not recommended for routine use[5]. Ginger is believed to be a natural galactagogue for a long time and proven safe to use[6]. Studies have shown its beneficial effect in increasing breast milk volume[7-10]. Ushiroyama et al published a study of Xiong-gui-tiao-xue-yin, a traditional herbal medicine consisting of ginger and other ingredients, in enhancement of lactation in spontaneous normal delivery[7]. The results found that it could increase prolactin level and improve lactation in women in postpartum period. In a 2016 randomized double-blind controlled trial of 63 women, Paritakul et al reported that dried ginger capsules (500 mg) could improve breast milk volume in the immediate postpartum period without any notable side effect[10]. Nowadays, due to their strong and spicy scent, instant ginger drink is a convenient option for people to use their medical properties, and it is very popular in postpartum women. As mentioned

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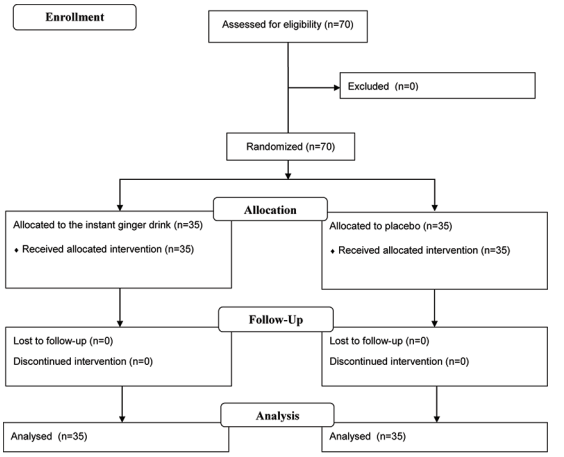

Figure 1. Consort flow chart.

previously, breast milk volume is affected by the route of delivery, so the author designed the present study to evaluate the effect of instant ginger drink on breastfeeding only in post cesarean mothers, which tend to have problem with insufficient milk production in the first few days.

Materials and Methods

The present study was a randomized, controlled, double-blind study of instant ginger drink in 70 post cesarean women. Postpartum women in Ramathibodi Hospital who delivered at gestational age 37 weeks or later, with singleton pregnancy, and without chronic underlying disease and intrapartum complication were included. The mother and her infant could breastfeed without any contraindication. Exclusion criteria were mothers who had mastitis, allergy to instant ginger drink, took other substances that increase breast milk production, or not willing to continue the study. Sample size was calculated by formula for continuous data from RCT. Based on the previous Paritakul et al study[10] and considering a drop-out rate of 15%, total sample size required was 70 (35 in each arm). Ethics and the protocol were approved by the Human Research Ethics Committee, Ramathibodi Hospital, Mahidol University.

After the investigators enrolled the participants and informed consents were obtained, the postpartum women who delivered by cesarean section were allocated in two groups, ginger group and control group (placebo), by random allocation using computer-generated sequences. The study flow chart is shown in Figure 1. The investigators, clinicians, outcome assessors, and participants did not know which intervention was received (double-blinded by using sealed envelope). The instant ginger drink consisted of 5 g of 100% instant ginger powder and 1 g sweetener in 150 mL water per drink. The placebo comprised of 150 mL of water, ginger scent, and 1 g sweetener without any ginger component. The preparation of instant ginger drink and placebo were processed by research assistant. Both were identical in packaging and difficult to recognize differences. After assignment, the patients were given the ginger drinks (150 mL of instant ginger drink or placebo drink) every 12 hours after 24 hours of delivery up to 72 hours.

Primary outcome was the total breast milk volume between 48 and 72 hours after delivery that represent stage II lactogenesis[11]. Breast milk volumes were measured by test-weighing method[12], generally accepted as a standard method of measuring breast milk production with TANITA: BD 815U weighing scale. Test-weighing were assessed by trained nurses, which measured the weights of fully clothed infants before and after each breastfeeding over 24 hours (48 to 72 hours of delivery). Lastly, the residual breast milk at 72 hours after delivery for 15 minutes was collected by electric breast pump (Medala Lactina Electric Plus Hospital Grade Breast pump). Antepartum, intrapartum, and postpartum data including age, gravida, gestational age, body mass index (BMI), hemoglobin at gestational age 28 to 32 weeks, indication for cesarean section (elective or emergency), blood loss, oxytocin use, infants' birthweight, LATCH score, breastfeeding frequency, and side effect from ginger drinks, were collected and analyzed.

Data were analyzed using SPSS version 18.0. Student t-test, Pearson Chi-square and Mann-Whitney U test were used. The p-value less than 0.05 was considered statistically significant.

Results

Seventy postpartum women at Ramathibodi Hospital were recruited. Characteristics of the participants are shown in Table 1. Baseline characteristics were compared between the ginger group and the placebo group on the basis of age, gravida, gestational age, BMI, hemoglobin level at gestational age 28 to 32 weeks, indication for cesarean section (elective or emergency), blood loss, oxytocin use, infants' sex and birthweight, LATCH score at 24 hours, and breastfeeding frequency. The mean maternal age was 31.8 and 32.12 years in ginger and placebo groups, respectively. The participants were primipara in 65.71% (n = 23) of ginger group and 64.7% (n = 22) of placebo group. There was no statistical difference

Table 1. Patient's baseline characteristics

Characteristics	Ginger group (n = 35) Mean±SD	Placebo group (n = 35) Mean±SD	p-value
Age (years)	31.80±5.14	32.12±5.00	0.796
Primiparous, n (%)	23 (65.71)	22 (64.70)	0.930
Gestational age (weeks)	38.54±1.01	38.44±1.11	0.691
Pre-pregnant BMI (kg/m^2)	22.24±3.22	22.96±3.79	0.395
Weight gain (kg)	14.94±4.51	14.25±4.56	0.531
Hemoglobin (g/dL) (at GA 28 to 32 weeks)	11.34±0.75	11.61±1.00	0.221
Induction, n (%)	1 (2.86)	1 (2.94)	1.000
Use of oxytocin for augmentation, n (%)	16 (45.71)	16 (47.06)	0.911
Elective cesarean section, n (%)	16 (45.71)	10 (29.41)	0.612
Blood loss at delivery (mL)	464.29±183.74	402.94±138.14	0.123
Male newborn, n (%)	17 (48.57)	19 (55.88)	0.543
Newborn birthweight (g)	3,199.43±412.97	3,092.94±308.26	0.230
LATCH score	7.66±0.68	7.50±0.99	0.448
Breastfeeding frequency	6.91±1.24	6.82±1.17	0.756

SD=standard deviation; BMI=body mass index; GA=gestational age

Table 2. Breast milk volume in 48 to 72 hours after post-cesarean delivery

Milk volumes groups	n	Median	P25	P75	p-value*
Ginger group	35	80.00	35.00	170.00	0.679
Placebo group	35	100.00	23.75	142.50	

* Mann-Whitney U test

No reported side effect

in maternal pre-pregnant BMI and total weight gain during pregnancy. The mean level of hemoglobin at gestational age 28 to 32 weeks were approximately 11 g/dL in both groups. No significant differences in other antepartum baseline characteristics were shown between groups (Table 1).

For the intrapartum baseline characteristics, elective caesarean section was 45.71% and 29.4% in ginger and placebo group, respectively. Only one case in each group received labor induction (2.86% and 2.94%) and equally 16 cases used oxytocin for augmentation of labor in each group (45.71% and 47.06%). There was no significant difference in blood loss during delivery. In the postpartum period, the LATCH score and breastfeeding frequency were not significantly different between the two groups.

The median of total breast milk volumes during 48 to 72 hours after delivery in ginger group was 80 milliliters, while the placebo group was 100 milliliters, no statistically significant difference between both groups (p=0.679). There was no side effect reported in both groups (Table 2). Meanwhile, all participants in the ginger group started breast milk expression, while three women in the placebo group did not initiate lactation (8.57%).

Discussion

There was evidence reported that cesarean delivery affected breast milk volume especially in the first week after delivery. Nowadays, the rate of cesarean section tends to increase and the problems with inadequate breast milk in postpartum women will increase as well. The present study was the randomized controlled trial to compare breast milk volume within 24 hours between ginger and placebo groups at 48 to 72 hours postpartum after cesarean delivery, using test-weighing method. The median of total breast milk volume between 48 and 72 hours after delivery in the ginger group was 80 mL per 24 hours, comparing with 100 mL per 24 hours in the placebo group. The authors found no significant difference between breast milk volumes at 48 to 72 hours after delivery of the instant ginger drink and placebo groups. The results showed that instant ginger did not affect breast milk volume in immediate post cesarean period. The volume of breast milk in the present study was lower than the prior studies for several reasons.

First, the authors' populations were post-cesarean delivery women that tend to have low milk supply problem. Oxytocin level was affected by the pain after operation may cause less breast milk production. Most of the participants in the present study were primiparous, in contrast, the previous studies were more multiparous, which could produce breast milk

sooner and higher in volume[10]. Furthermore, the average maternal age in the present studies were more mature than the other studies and all mothers and infants did not have exclusive breastfeeding. The breastfeeding frequency was six times per day, which is lower than the previous studies[10]. Those reasons might cause a lower mean volume of breast milk and it may be difficult to detect the minor differences in quantities of breast milk when comparing between intervention and placebo groups.

In the present study, the authors compared breast milk volume between ginger and placebo groups at 48 to 72 hours postpartum after cesarean delivery. These periods can represent the stage II of lactogenesis in both primiparous and multiparous. Interestingly, as a result, all participants in the ginger group started breast milk expression, while three women in the placebo group did not initiate lactation (8.57%). The effects of the ginger and the instant ginger drink on initiation of lactation should be further evaluated. With test-weighing method, we accurately measured breast milk volume without interrupting maternal-infant bonding.

The instant ginger drink used in the present studies comprised 5 g of dried ginger powder per drink while the ginger capsule from previous study was consisted of 500 mg dried ginger[10]. The authors did not evaluate deeply to the types and amount of bioactive compounds. However, the different chemical components in the other forms of ginger may cause the variations on breast milk effects. The instant drinks form of ginger also had limited by its taste and scent, while the ginger capsules did not. Without this limitation, the ginger capsules may have contained more bioactive compounds that can increase the breast milk volumes after the immediate deliveries in the previous studies[10].

As the strength of the present study, it was a randomized double-blind controlled trial with minimal bias. In addition, the study reevaluated new data on the effect of the instant ginger drink on breast milk volume with the standard method of measurement. Because the present research did not study different doses and frequency of the instant ginger drink that affect the breast milk volume, there might be the limitations of the study. Thus, more data on long-term effects was needed. Furthermore, the planning study should be made on larger population to evaluate the instant ginger drinks effects on breast milk volume and quality.

Conclusion

Instant ginger drink did not affect breast milk volume between 48 and 72 hours after cesarean delivery.

What is already known on this topic?

Ginger in form of traditional herbal medicine and capsule can improve breast milk volumes in postpartum women in recent studies. Nowadays, instant ginger drinks are convenient and easy to use. Route of delivery affects breast milk volume. The volume of breast milk is decreased especially in the first week after cesarean delivery.

What this study adds?

Instant ginger drinks do not affect breast milk volume within 48 to 72 hours after cesarean delivery.

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Conflicts of interest

The authors declare no conflict of interest.

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