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A COMPARISON OF THE EFFECTS OF GENERAL ANAESTHESIA AND SPINAL ANAESTHESIA ON BREASTFEEDING

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Abstract

The aim of the present study was to compare the effects of general anaesthesia and spinal anaesthesia on breastfeeding in caesarean sections.

Pregnant women at term, admitted for elective caesarean section and whom we could contact by phone were included. The patients were divided into two groups: general anaesthesia (Group G) and spinal anaesthesia (Group S). Breastfeeding was assessed by other anaesthetists at 1 hour, 24 hours and 6 months postoperative.

No statistically significant difference was found between the two groups in terms of the first breastfeeding interval. There was no significant difference between groups in the rate of breastfeeding within the first hour of delivery and the first 24 hours (respectively; Group G: 15.5%; Group S: 21.8%, Group G: 91.4%; Group S: 97%). The rate of breastfeeding at 6months was significantly higher in Group S (80.9%) than in Group G (67.2%).

In term pregnancies, the type of anaesthesia does not affect the first breastfeeding interval. However, spinal anaesthesia has a positive effect on the maintenance of breastfeeding longer than 6 months.

Key words: breastfeeding, general anaesthesia, spinal anaesthesia, caesarean section

Introduction. Breastmilk is the only physiological source of nourishment that contains the nutrients an infant needs at the right amount and quality [1, 2]. The World Health Organization (WHO) states that breastmilk has an important

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role in increasing the life expectancy and in improving the life quality of infants, and it recommends that mothers exclusively breastfeed infants for the first 6 months and thereafter continue breastfeeding with complementary foods for up to two years of age [3]. Breastfeeding decreases the risk of several undesirable outcomes, including sudden infant death syndrome, severe lower respiratory system infections, non-specific gastroenteritis, type 1 and 2 diabetes mellitus and childhood acute lymphocytic and acute myeloid leukaemia. Also, breastmilk has been associated with decreased risk of breast cancer, ovarian cancer, type 2 diabetes mellitus and post-partum depression in mothers [3, 4]. Breastfeeding difficulties in the early post-partum period in mothers undergoing caesarean section are common [5]. Neuraxial anaesthesia is still the gold standard in vaginal and caesarean section delivery if it is not contraindicated [2, 6]. Prolonged labour during delivery can have serious physiological and chemical adverse effects on both the mother and the infant. The quantity of analgesics and anaesthetics administered to the mother may be associated with breastfeeding difficulties [1].

This study aims to compare the effects of general anaesthesia and spinal anaesthesia in caesarean sections on the first breastfeeding interval and long-term breastfeeding.

Material and methods. ***Patients.*** The Human Research Local Ethics Committees and the Australian New Zealand Clinical Trials Registry (Ref: ACTRN12616000677404) granted approval. All subjects provided written informed consent before participation. This trial was a single-centre, prospective, single-blind, controlled and observational trial in patients undergoing caesarean section. This study followed the Ethical Principles for Medical Research Involving Human Subjects as outlined in the Declaration of Helsinki. This study was conducted in our hospital certified as Baby Friendly Hospital Initiative (BFHI). All term (gestational age $\geq$ 37 week) pregnant women who were admitted for elective caesarean section and who contacted by phone were included in the study. Preterm women, those with foetal distress, severe pre-eclampsia, other medical conditions leading to intrauterine growth retardation, mentally retarded women, those who did not cooperate, under the age of 18 and those who have language problem were excluded from the study. The patients whose infants were admitted to the neonatal intensive care unit after delivery were no more eligible to participate in the study.

Outcomes. The primary outcomes were the first breastfeeding interval and the rate of breastfeeding in the first hour after surgery. The secondary outcome was the rate of breastfeeding in the first 6 months after birth which were evaluated by phone. Demographic data, characteristics related to breastfeeding, and the data after 6 months were recorded.

The mothers were encouraged and taught how to breastfeed their newborns according to BFHI points. The patients were assessed by other anaesthetists whom were blinded to the type of anaesthesia at 1 hour, 24 hours and 6 months

postoperative. The first breastfeeding interval was determined. The first breastfeeding interval was defined as the time from admittance to the post-anaesthesia care unit until first breastfeeding. A phone interview was made at 6 months postpartum. The patients who we could not reach by phone were excluded from the follow-up.

Anaesthesia management. The type of anaesthesia was chosen by the patients and the anaesthetist independent from the study. The patients were divided into two groups based on the type of anaesthesia.

Group G ($n = 110$): Preoxygenation was achieved with 100% O_2 for 3 min. To induce general anaesthesia, 1.5 mg/kg, lidocaine, 2 mg/kg of propofol and 0.9 mg/kg of rocuronium were administered. After the infant was delivered, 1 µ/kg of fentanyl was administered. For maintenance sevoflurane was given. For postoperative pain, 20 mg of tenoxicam was administered intravenously before extubation.

Group S ($n = 220$): Spinal anaesthesia was performed by inserting a 25G Quince needle at the L_{3-4} or L_{4-5} space. Afterwards, 12 mg of hyperbaric bupivacaine 0.5% was administered. When the pain began at postoperative period, 20 mg of tenoxicam was administered intravenously for postoperative pain control at clinic.

Statistical analysis. As the descriptive values, mean and standard deviation were used for quantitative data, and frequency and percentage were used for qualitative data. The Shapiro–Wilk test was used to analyze normal distribution of the data. When comparing the groups, chi-square and Fisher's exact test were used for categorical variables, and t-test was adopted for continuous variables. The significance level was defined as $p < 0.05$.

Results. Among the 1380 patients undergoing caesarean section, 330 were included in the study, and 82 mothers whose contact numbers were wrong or changed, and who refused to answer our calls were excluded from the study. A total of 248 patients were assessed statistically. No significant difference was found between the two groups in terms of patient characteristics (Table 1).

There was no significant difference between the groups in terms of first breastfeeding interval and rate of breastfeeding within the first hour of delivery (Table 2). Among the patients, 19.9% breastfed their infants within the first hour of delivery. No significant difference was found between the groups in terms of the rate of breastfeeding within the first 24 hours while the difference between the groups regarding breastfeeding at 6 months was significant (Table 2). The first breastfeeding interval was not significant. Table 3 shows the patients' answers to the other questions about breastfeeding.

Discussion. No statistically significant difference was found between the groups in terms of breastfeeding within 1 hour and 24 hours after delivery. Moreover, no statistically significant difference was found between the two groups regarding the first breastfeeding interval. However, a statistically significant dif-

T a b l e 1

Demographic data of study groups

	Group G ($n = 78$)	Group S ($n = 170$)	p
Age (year)	30.27 ± 5.31	29.78 ± 5.22	0.54
Body mass index (kg/m^2)	30.21 ± 4.81	30.80 ± 5.59	0.48
Educational status (%)			0.10
Literacy	5.3	10.1	
Primary School	73.7	56.7	
High School	15.8	18.9	
University	5.3	14.2	
Primiparous (%)	19	20.1	0.85
Multiparous	81	79.9	

T a b l e 2

Primary and secondary outcomes

	Group G ($n = 78$)	Group S ($n = 170$)	p
First breastfeeding interval (h)	10.13 ± 17.85	6.37 ± 13.72	0.11
Breastfeeding in the first hour (%)	15.5	21.8	0.32
Breastfeeding in the first 24 hours (%)	91.4	97	0.09
Breastfeeding after the first 24 hours (%)	8.6	3	
Continuing to breastfeed during 6 months (%)	67.2	80.9	0.03*

* < 0.05

T a b l e 3

Characteristics related to breastfeeding

	Group G ($n = 78$)	Group S ($n = 170$)	p
Receiving education about breastfeeding (%)	29.3	26.2	0.64
Breastfeeding older children (%)	78.8	88	0.09
Duration of breastfeeding older children (months)	12.20 ±9.26	14.25 ±9.26	0.19
Having problems with breastfeeding previously (%)	23.4	17.6	0.261

ference was found between the groups in terms of the rate of breastfeeding at 6 months. Traditionally, willingness and effort to breastfeed are highly prevalent

in Turkey. However, time to initiate breastfeeding and breastfeeding behaviours are not at the desired levels.

Data from the Turkey Demographic and Health Survey (TDHS) in 2013 shows that time to initiate breastfeeding is long in Turkey, the rate of breastfeeding initiation within the first hour of delivery among all infants is only 50%, and 30% of the infants are not breastfed at all within 24 hours of delivery [7]. Breastfeeding within the first hour and the first day of delivery was 50% and 70%, respectively in TDHS-2013 [7]. When compared with the Turkey average, the rate of breastfeeding within the first hour was lower in our study, whereas within the first 24 hours was higher. The reason why the rate of breastfeeding within the first hour was lower could be that we only included caesarean section cases in our study. The reason why the rate of breastfeeding within the first 24 hours was higher than the Turkey average could be that we only included healthy new-borns and pregnant patients at term. Although our hospital is in one of the largest cities, and has a low sociocultural profile. For this reason, the patients had low educational attainment, and we were able to reach only a few of them at the end of 6 months. The fact that the sociocultural level of the mothers included in our study was low could explain the increased interest in breastmilk, which is affordable and readily available. In addition, the fact that the number of patients with previous experience of breastfeeding was high because of the high rate of multiparity and that the number of working mothers was low could have caused the increased interest in breastfeeding. A study conducted in Australia found similar rates of breastfeeding within the first hour (22%) in emergency caesarean section cases [8]. However, the patient group in our study was elective caesarean section cases. Another study conducted in Australia found that, unlike in our study, the rate of breastfeeding at delivery was 90% and the rate of breastfeeding at 6 months was 15% [6]. Although the rate of breastfeeding initiation was similar to that in our study, the rate of breastfeeding at 6 months decreased to a level below that recommended by the WHO. The WHO records show that only 38% of infants are breastfed globally. The WHO aims to increase the rate of exclusive breastfeeding in the first 6 months to at least 50% by 2025 [3]. The rate of breastfeeding in our study was already above the WHO 2025 target.

The type of anaesthesia may affect breastfeeding initiation [9]. Unlike in our study, many studies have indicated that general anaesthesia prolongs the first breastfeeding interval compared with regional anaesthesia [10–12]. Delayed awakening, delayed recovery of cognitive functions and delayed communication between mother and infant in general anaesthesia may prolong the first breastfeeding interval. Medications used in general anaesthesia may be an effective factor in inducing and initiating breastfeeding. The fact that no difference was found between the groups regarding the first breastfeeding interval in our study could be attributed to the prolonged first breastfeeding interval in both groups. The effect of general anaesthetic medications disappeared, and the patients' cog-

nitive functions recovered because of the prolonged first breastfeeding interval. The fact that the first breastfeeding interval was long suggests that either the mothers did not receive adequate education or they could not implement what they had learned. An adequate number of trainers nurses should be available for encouraging breastfeeding in the first hour of delivery, and time to first physical contact with the infant should be minimised. The first physical contact between mother and infant should ideally take place in the operating room or in the post-anaesthesia care unit. This study demonstrated that our hospital failed in ensuring that this would happen. Therefore, we will make the necessary arrangements to establish the first physical contact between mother and infant as early as possible. A study conducted in Turkey found that time to breastfeeding initiation was significantly prolonged in the general anaesthesia group (25 h) compared with the spinal anaesthesia (10.8 h), epidural anaesthesia (11.8 h) and vaginal delivery (10.9 h) groups [10]. The authors found that rate to initiate breastfeeding in the first 24 hours was 62% in the general anaesthesia group and 85.8% in the spinal anaesthesia group [10]. In our study, the rate of breastfeeding within the first 24 hours was quite high. Another study found that time to initiate breastfeeding was 2.4 days in the spinal anaesthesia group and 2.5 days, which were quite long, in the combined spinal and epidural anaesthesia group [13]. Unlike our study, another study conducted in Turkey ($n = 30$) found that the first breastfeeding interval was significantly longer in the general anaesthesia group (228.07 min) than in the epidural anaesthesia group (107.40 min) [12]. Similar to the findings of our study, 188 patients had no significant difference between general anaesthesia (130 min) and spinal anaesthesia (110 min) in terms of the first breastfeeding interval [14]. Lie et al. [15] found that the epidural anaesthesia group had a higher breastfeeding frequency and of longer duration (3 months and 6 months) than the general anaesthesia group undergoing caesarean section.

The limitations of this study include of that breastfeeding was not scored, and the number of patients undergoing general anaesthesia was low. Our clinical preference for caesarean section anaesthesia is regional anaesthesia, and general anaesthesia rate is about 20%, and we did not find ethical to suggest caesarean section surgery under general anaesthesia to patients for this study. Anaesthetist who evaluated the breastfeed might not be blinded to the study at postoperative 1 hour. Our study could be criticized for not evaluating bottle feeding, breastfeeding problems in the first 24 hours, nipple problems, and birth weight. The number of patients who could not be reached at 6 months was high.

Conclusion. We believe that our study contributes to the literature by providing an evaluation of the effects of spinal anaesthesia and general anaesthesia on breastfeeding. We consider that in term pregnancies, the type of anaesthesia does not affect the first breastfeeding interval. On the basis of this study one may conclude that the breastfeeding after spinal anaesthesia is maintained for a longer period than after general anaesthesia. Spinal anaesthesia may be recommended

as the preferred anesthesia with respect to the breastfeeding for caesarean section. The impacts of general or spinal anaesthesia on breastfeeding need more studies to be clear.

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