




The Effects of Cord Clamping Time and Early Skin-to-Skin Contact on Maternal Birth Satisfaction in Term Infants

Kubra Genc¹ , Ayse Karakoc² , Taner Celikel¹ 

¹ Kocaeli Fatih Public Hospital, Istanbul, Turkey.

² Marmara University Faculty of Health Sciences Midwifery Department, Istanbul, Turkey.

Correspondence Author: Ayse Karakoc

E-mail: akarakoc@marmara.edu.tr

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ABSTRACT

Objective: Meeting the expectations of mothers during labor is defined as birth satisfaction. Evaluation of women's perception of satisfaction at birth is an important quality criterion in the evaluation of services. This study aims to determine the effect of cord clamping time and early skin contact on maternal birth satisfaction.

Methods: Randomized controlled experimental study. The study data were collected between June and December 2018, from a total of 80 participants.

Results: Case group was applied late cord clamping and skin contact, control group was applied routine care. The first breastfeeding time was 11.20 ± 5.16 min. for the case group and 44.55 ± 18.03 min. for the control group ($p < 0.001$). Neonatal blood glucose levels within the first 15 minutes were 91.23 ± 20.61 mg/dL for the case group and 83.13 ± 14.17 mg/dL for the control group ($p = 0.044$). Hemoglobin levels of the newborn 24 hours after birth were 18.90 ± 1.58 g/dL for the case group and 18.13 ± 1.78 g/dL for the control group ($p = 0.042$). The difference between the before and after birth hemoglobin-hematocrit values of the mothers was not statistically significant ($p = 0.327$ for Hgb; $p = 0.238$ for Htc). Postpartum satisfaction levels of the mothers were found to be 106.28 ± 9.52 for the case group and 99.93 ± 13.17 for the control group; mothers at the case group had higher postpartum satisfaction levels ($p = 0.016$).

Conclusion: Late cord clamping and early skin contact in newborn positively affect the first breastfeeding time, hemoglobin, hematocrit and blood sugar levels of newborns and can be considered as an important factor that increases mothers' satisfaction independent of many variables.

Keywords: Newborn, late cord clamping, skin to skin contact, maternal birth satisfaction.

1. INTRODUCTION

The World Health Organization (WHO) recommends 1-3 minutes postpartum as the cord clamping time for all non-asphyxial newborns that do not require resuscitation (1). According to the routine approach in Turkey, it is considered appropriate to keep the umbilical cord at the baby-perineum level (30-45 sec) due to the risk of polycythemia and hyperbilirubinemia.

The mother and the baby should not be separated from each other within the first two hours after birth and should spend this time in skin contact with each other. Weighing, measuring, dressing, performing the first examination, etc., which requires separation from the mother. procedures should be performed at the end of the monitoring period in the delivery room, after two or three hours. Immediate skin to skin contact (SSC) after birth was associated with stable body temperature, stable blood glucose level, less crying, less respiratory distress, earlier and more effective sucking, and longer breastfeeding time (2).

Meeting the expectations of mothers during labor is defined as birth satisfaction. Every woman's expectation from birth is different and each woman's satisfaction varies according to different characteristics. Evaluation of women's perception of satisfaction at birth is an important quality criterion in the evaluation of services. Increasing the quality of maternity services and reducing the cost per patient has become a health policy adopted by all countries of the world (3,4).

Giving birth is an important experience in women's life. A traumatic birth experience may pose a risk to problems such as post-partum depression, post-traumatic stress disorder, sexual dysfunction, Cesarean section, inadequate maternal attachment and infant neglect (5-7).

Demographic characteristics of the mother, mode of delivery, planning of delivery, hospital environment and facilities, attitudes and behaviors of health personnel, and the effects of various factors such as prenatal education have been

evaluated in the studies conducted on birth satisfaction and results vary (8-14).

The effects of Early Cord Clamping (ECC) and early skin-to-skin contact (SSC) are popular research topics in recent years, but there are not any studies being conducted on the effects of these on maternal satisfaction. In this respect, this research would contribute to the literature. The aim of this study is to determine the effects of ECC and early SSC on maternal birth satisfaction in term infants.

2. METHODS

This is a randomized controlled experimental study conducted to determine the effects of cord clamping time and early skin contact on maternal birth satisfaction in term infants. The table of random numbers was used in line with the simple random sampling method.

A total of 80 mothers and infants were included in the study, 40 in the control group and 40 in the case group. In the mothers included in the case group, the umbilical cord was cut after waiting for 1-3 minutes (mean 2 minutes) according to WHO recommendations and the newborn was laid naked in the mother's chest for the first 15 minutes. During the procedure, the baby's back was wrapped with a heated cover and the headgear was dressed. First breastfeeding and skin contact was provided. Measurements of height, weight, and head circumference, and administration of vitamin K and Hepatitis B vaccine were performed after the completion of skin-to-skin contact. Data were collected in the first 15 minutes, during the SSC. In the control group, the umbilical cord was cut within 30 seconds after the baby was born in accordance with routine hospital practices, and the routine care of the newborn was performed under a radiant heater.

2.1. Participants

The study data were collected between May 2018 and December 2018 from pregnant women who met the inclusion criteria and accepted to be involved in the study. The study sample consisted of 901 pregnant women who admitted to the state hospital for labor and delivery in the previous year. The power of the study was targeted to be 80% and $\alpha=0.05$, and the sample size was calculated. In the study, type I error was limited to 0.05 and type II error rate was limited to 0.20. Under these conditions, the minimum number of subjects required for each group was determined to be 37 in order to find a significant difference of 5.00 units between the two groups. The study was completed with 80 mothers (Consort Diagram: Appendix 1).

The inclusion criteria consisted of 'primiparous and multiparous mothers aged 18-38 years without any risk during pregnancy and postpartum' and 'healthy term babies born at term (38-42

weeks) and 2500-4000 g, with Apgar score above 7, with no need for resuscitation and any congenital anomalies'.

2.2. Data Collections and Tools

General Information Form, Maternal and Newborn Data Form, and Birth Satisfaction Scale (BSS) were used for data collection. General Information Form includes questions regarding the socio-demographic characteristics of the participants such as age, gender, marital status, education level, occupation, and number of children. Maternal and Newborn Data Form includes questions such as the mother and the baby's vital signs in the first 24 hours after the birth, the first breastfeeding time, and the Apgar score (Appendix 2).

BSS was developed by Caroline Hollins Martin and Valerie Fleming in 2011 to assess women's perceptions of birth (15). Validity and reliability were not made in the first form. Martin et al. revised the scale in 2014 and did a validity and reliability study, and reported the Cronbach's alpha value as 0.79 (16). Cetin et al. (2015) performed the validity and reliability study of the first version of the scale in Turkish Language (3). It is a 5-point Likert type scale and scored as follows: Strongly agree: 5, Agree: 4, Undecided: 3, Disagree: 2, Strongly disagree: 1. Items 4, 8, 12, 15, 16, 17, 19, 20, 21, 23, 25, 29 are scored in reverse. The scale has 30 items and the score can vary between 30-150 points, and the higher the score, the higher the satisfaction with birth. Cronbach's alpha value of the scale was 0.79 in this study.

The following measuring devices were used: Acon Mission Hb & Hct Meter, Seca 834 Digital Baby Scale, Clever chek TD-4231 Blood Glucose Meter

2.3. Data Analysis

In order to test the normality of data distribution, the skewness and kurtosis values were between -1.5 and +1.5 and the data were found to be reliable. The internal consistency coefficient (the Cronbach's alpha value) of the scale was 0.79. In the study, independent groups t-test was used for comparison of normally distributed binary groups and a non-parametric Mann Whitney U test was used for comparison of non-normally distributed binary groups. In the study, one-way ANOVA analysis was used for comparison of more than two groups with normal distribution, and the non-parametric Kruskal-Wallis H test was used for comparison of more than two groups that were non-normally distributed.

2.4. Ethical Considerations

Approval was received from the Marmara University Faculty of Medicine Clinical Research Ethics Committee on April 6, 2018, with the protocol code 09.2018.274. Verbal and written informed consent was obtained from women who agreed to participate in the study. Permission to use the scale was obtained.

3. RESULTS

In the study, the mean \pm standard deviation (SD) age of the mothers was found to be 27.70 ± 5.50 in the case group and 26.67 ± 4.98 in the control group. There was no statistically significant difference between the case and control groups in terms of age, education, income level, working status, presence and number of children, family type, presence of chronic disease (diagnosed during pregnancy), Rh incompatibility, number of pregnancies, and gestational week ($p > 0.05$). The demographic characteristics of the two groups were similar.

In Table 1, according to the time of postnatal first breastfeeding the difference between the case group (11.20

± 5.16 min) and the control group (44.55 ± 18.03 min) was statistically significant ($p < 0.001$). The difference between systolic blood pressure values of the case group mothers (99.00 ± 8.41 mmHg) and the control group mothers (104.25 ± 10.83 mmHg) was statistically significant ($p = 0.018$). At the 60th minute and the 24th hour postpartum measurements, the difference between the pulse rate of the case group and the control group was statistically significant ($p = 0.046$ and $p < 0.001$, relatively). The difference between the before and after birth hemoglobin (Hgb) and hematocrit (Htc) values of the mothers was not statistically significant ($p = 0.327$ and $p = 0.238$, respectively).

Table 1. Comparison of Vital Signs and Blood Values of Mothers

Time of Measurement	Variables	Mean \pm SD		T	Sd	p
		Study Group n=40	Control Group n=40			
Postpartum	Time of first breastfeeding (min)	11.20 \pm 5.16	44.55 \pm 18.03	-11.245	45.36	0.000
Postpartum within the first 15 minutes	Systolic BP(mmHg)	99.00 \pm 8.41	104.25 \pm 10.83	-2.421	78	0.018
	Diastolic BP(mmHg)	63.00 \pm 8.23	64.75 \pm 9.87	-0.861	78	0.392
	Pulse Rate	79.83 \pm 7.54	80.68 \pm 5.75	-0.567	78	0.572
60 th minute of postpartum	Systolic BP(mmHg)	101.00 \pm 7.44	103.25 \pm 10.71	-1.091	69.52	0.279
	Diastolic BP(mmHg)	65.25 \pm 8.16	63.75 \pm 9.25	0.769	78	0.444
	Pulse Rate/dk	81.08 \pm 6.78	84.88 \pm 9.00	-2.031	69.76	0.046
24 hours after birth	Systolic BP(mmHg)	101.10 \pm 9.15	97.15 \pm 16.05	1.352	78	0.180
	Diastolic BP(mmHg)	63.00 \pm 6.26	61.70 \pm 9.19	0.739	68.81	0.462
	Pulse rate/dk	79.43 \pm 6.85	86.38 \pm 8.95	-3.902	78	0.000
Difference in Hgb and Htc levels before and after birth	Hgb (g/dL)	1.02 \pm 1.07	0.79 \pm 0.79	0.993	39	.327
	Hct (%)	3.97 \pm 5.51	2.42 \pm 5.54	1.197	39	.238

BP: Blood pressure; Hgb:Hemoglobin Htc:Hematocrit

In Table 2, blood glucose values of newborns measured at the first 15th minute after delivery were found to be 91.23 ± 20.61 mg/dL for the case group and 83.13 ± 14.17 mg/dL for the control group. The difference between the groups was statistically significant in favor of the case group. The difference between SpO₂ values, Hgb and Htc values measured in the newborns at the 24th hour postnatal period was statistically significant in favor of the case group ($p < 0.05$).

In Table 3, maternal BSS scores were 106.28 ± 9.52 in the case group and 99.93 ± 13.17 in the control group, and the difference between the groups was statistically significant ($p = 0.016$).

The correlation between birth satisfaction score and age, education, working status, presence of child, and family type was found to be statistically insignificant. The increased income status in the control group and the prenatal education satisfaction level in the case group were found to significantly correlate with birth satisfaction score.

Table 2. Comparison of Vital Signs and Blood Values of Newborns

Time of measurement	Variables	Mean±SD		T	P
		Study Group n=40	Control Ggroup n=40		
Postpartum within the first 15 minutes	APGAR first min.	9.00±0.00	8.93±0.27	1.778	0.083
	APGAR 5 th min.	10.00±0.00	9.93±0.27	1.778	0.083
	SpO2	94.58±8.97	94.98±6.85	-0.224	0.823
	Pulse Rate/dk	135.50±13.16	139.38±7.41	-1.622	0.109
	Body Temperature/ °C	36.65±0.29	36.57±0.21	1.541	0.127
	Blood Sugar(mg/dL)	91.23±20.61	83.13±14.17	2.049	0.044*
	Hemoglobin(g/dL)	20.31±1.33	19.93±1.53	1.172	0.245
	Hematocrit (%)	59.73±3.88	58.70±4.45	1.098	0.275
	Body weight(g)	3406.75±354.23	3289.75±480.77	1.239	0.219
24 hours after birth	Body weight(g)	3237.25±349.16	3131.75±472.67	1.135	0.260
	SpO2	97.30±1.07	96.08±1.89	3.575	0.001*
	Pulse rate/dk	128.63±11.25	125.38±9.45	1.399	0.166
	Weight loss(g)	162.70±63.19	158.00±54.64	0.356	0.723
	Blood sugar(mg/dL)	81.45±9.43	80.20±14.06	0.467	0.642
	Hemoglobin(g/dL)	18.90±1.58	18.13±1.78	2.067	0.042*
	Hematocrit (%)	55.65±4.63	53.30±5.14	2.148	0.035*

SpO2:Blood Oxygen Saturation

Table 3. Comparison of birth satisfaction levels of mothers in the case and the control groups

Mean±SD		T	Sd	P
Experimental Group (n=40)	Control Group (n=40)			
106.28±9.52	99.93±13.17	2.471	70.99	0.016

4. DISCUSSION

No statistically significant difference was found between the case and the control groups in terms of age, education, income, working status, presence and number of children, family type, chronic disease (diagnosed during pregnancy), Rh incompatibility, number of pregnancies, and gestation week ($p>0.05$). The demographic characteristics of both groups were similar and the groups were homogeneously distributed.

In the study, the time to start breastfeeding was significantly earlier in the case group ($p<0.001$). Continuous skin contact until the time of first breastfeeding facilitates breastfeeding and helps the baby gain a better suction technique from the very beginning (2). WHO recommends SSC with the mother during the first hour after birth to prevent hypothermia and to promote breastfeeding in newborns without complications (1).

Similar to the results of the study, in the studies conducted to determine the effect of post-partum early term baby skin contact on breastfeeding; early SSC was reported to have a positive effect on first breastfeeding time and breastfeeding success (17-22).

When the life signs of postpartum mothers were evaluated; control group mothers' systolic blood pressure in the first 15 minutes, and the heart rate after one hour and 24 hours was found to increase significantly. When stress physiology

is examined, it is stated that there is an increase in heart rate, blood pressure and respiration rate during stress and these values are regulated when coping with stress (23). In this respect, it can be said that the skin contact applied in the early postpartum period facilitates mothers' coping with birth stress. In parallel with the study, with SSC, a reduction in stress responses such as systolic blood pressure and cortisol levels has been reported in preterm infant fathers (24).

The differences between prenatal and postnatal maternal Hgb and Hct levels were not statistically significant. Similarly, in various studies, no differences were found in Hgb and Htc levels of mothers with Late Cord Clamping (LCC) and it was reported that LCC was not associated with postpartum hemorrhage (25,26). In this respect, it can be said that the cord clamping time has no negative effect on postpartum hemorrhage.

Hypoglycemia is frequently observed in healthy newborns as a result of the metabolic adaptation process in the first postpartum hours. Therefore, it is recommended that all babies should be breastfed for the first 30 minutes in the postpartum period (27). SSC at birth also facilitates immediate breastfeeding (18,19,21). In the study, blood glucose levels of the newborns who were treated with SSC at the first hour were found to be significantly higher. In studies examining various parameters of neonatal SSC administered at birth, it was reported that blood glucose levels were significantly safe (22,28).

LCC is recommended by the WHO. In evidence-based studies, it has been emphasized that LCC increases hemoglobin and hematocrit levels and therefore has hematological advantages (25,26,29-33). Similarly, Htc and Hgb values were significantly higher in the experimental group newborns at the 24th hour postpartum.

Evaluation of satisfaction perception of women at birth is an important criterion in the evaluation of health care. Childbirth is an important experience in women's life, the level of satisfaction in this process is considered important for maternal-newborn health and positive family relationships (5,8,34). As a result of traumatic birth experience in women; post-partum depression, post-traumatic stress disorder may cause problems such as sexual dysfunction, cesarean section, insufficient maternal attachment, and neglect of infants (5-7,35).

In the study, birth satisfaction levels of case group mothers were found to be higher ($p < 0.05$). When mothers' BSS scores were analyzed in terms of demographic characteristics, the relationship between BSS and age, education, working status, presence of child and family type was found to be statistically insignificant. According to the studies, the significance of the factors affecting birth satisfaction varies (4,8,9,11-14).

Limitations: Newborn blood sugar could not be measured at the 6th hour because it was not in hospital routines.

5. CONCLUSION

LCC and early skin contact in newborn positively affect the first breastfeeding time, hemoglobin, hematocrit, and blood sugar

levels of newborns. It can be said that mothers' satisfaction with birth is affected by too many components, but providing LCC and SSC provides significant efficacy independent of other factors. LCC and early SSC are important factors that increase maternal satisfaction regardless of age, education, working status, and presence of children. We can also say that birth satisfaction is an important factor for strategies to improve perinatal care

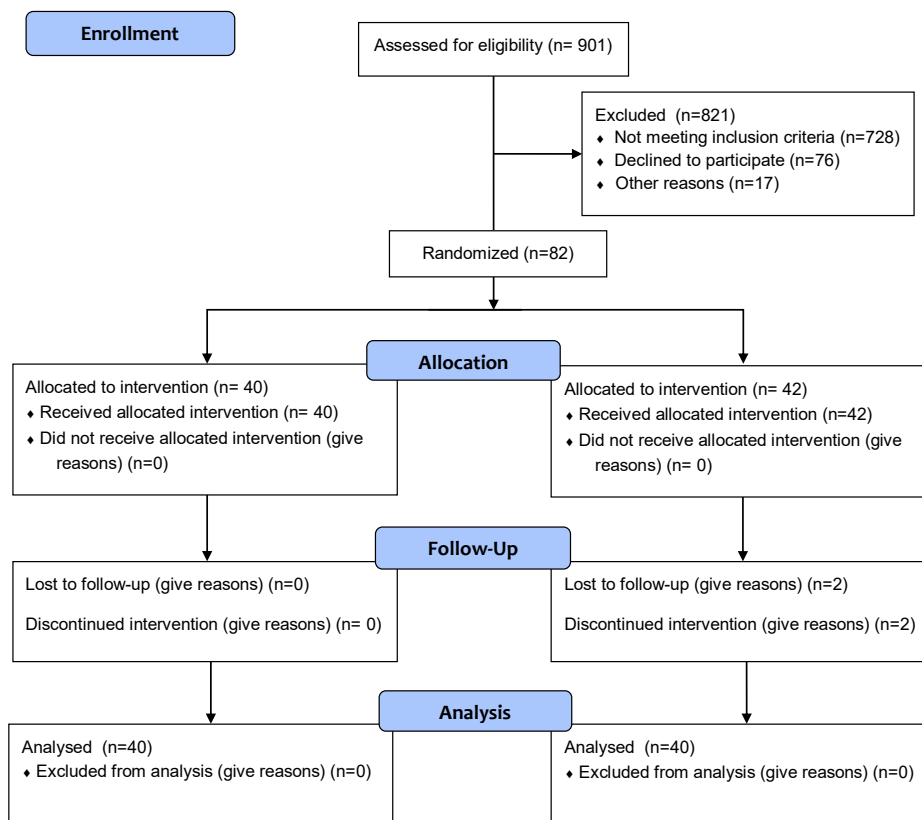
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Appendix 1. CONSORT Flow Diagram



Appendix 2. Data collection planning

	Mothers	Newborns
	Time of first breastfeeding time	
Post-partum first 15 minute	Blood pressure Pulse rate	APGAR (1-5min) SpO ₂ Pulse rate Body temperature Blood sugar Hemoglobin Hemotocrit
Postpartum 60 th minute	Blood pressure Pulse rate	Body weight
Postpartum 6 th hour	Hemoglobin Hemotocrit Bleeding control	Newborn blood sugar could not be measured at the 6 th hour because it was not in hospital routines
Postpartum 24 th hour	Blood pressure Pulse rate Birth satisfaction scale	Body weight Spo2 Pulse rate Blood sugar Hemoglobin Hemotocrit

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