

VAJİNAL DOĞUMDA OKSİTOSİN İNDÜKSİYONU ALAN VE ALMAYAN ANNELERİN EMZİRME SONUÇLARININ KARŞILAŞTIRILMASI

COMPARISON OF BREASTFEEDING RESULTS OF MOTHERS WHO HAVE RECEIVED AND WHO HAVE NOT RECEIVED OXYTOCIN INDUCTION DURING VAGINAL DELIVERY

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Keywords: Oxytocin induction, Breastfeeding, Vaginal delivery

Vajinal Doğumda Oksitosin İndüksiyonu Alan ve Almayan Annelerin Emzirme Sonuçlarının Karşılaştırılması, İzmir-2014, Dokuz Eylül Üniversitesi Sağlık Bilimleri Enstitüsü, Doğum ve Kadın Hastalıkları Hemşireliği Yüksek Lisans Tezi.

ÖZ

Amaç: Vajinal doğumda oksitosin indüksiyonu alan ve almayan annelerin emzirme sonuçlarının incelenmesidir.

Yöntem: Tanımlayıcı ve karşılaştırmalı tipte yapılan çalışma; Sağlık Bakanlığına bağlı bebek dostu hastanede, oksitosin indüksiyonu alan 70, almayan 70 toplam 140 postpartum kadın ile gerçekleştirilmiştir. Veri toplamak amacıyla araştırmacı tarafından hazırlanan tanıtıcı bilgi formu, doğum sürecini değerlendirme formu, laktasyon durumu, bebeğin emme davranışı, ilk emzirmeyi değerlendirme formu ve ilk 12 saatte emzirme uygulamalarını değerlendirme formu kullanılmıştır. Veriler iki ortalama arasındaki farkın önemlilik testi, ki-kare testi ile değerlendirilmiştir.

Bulgular: Oksitosin indüksiyonu alan kadınların almayanlara göre; ilk emzirme zamanının daha geç ($p=0.056$), ilk emzirme süresinin daha düşük ($p=0.00$), en çok yaşadıkları problemin laktasyon olmaması olduğu saptanmıştır ($p=0.00$). On iki saatin sonunda oksitosin indüksiyonu alan kadınlarda almayanlara göre; emzirme problemi yaşama durumunun daha fazla olduğu ($p=0.00$), tam emzirme oranının da düşük olduğu ($p=0.00$) tespit edilmiştir.

Sonuç: Bu nedenle oksitosin indüksiyonu alan bu annelere özel emzirme protokolleri oluşturulmalı, doğumdan sonra özellikle ilk saatlerde emzirme konusunda desteklenmelidir.

SUMMARY

Objective: To examine breastfeeding results of mothers who have received and who have not received oxytocin induction during vaginal delivery.

Methods: The study carried out as descriptive and comparative types was conducted in the baby-friendly hospital of the Ministry of Health with a total of 140 postpartum women 70 of whom received oxytocin induction and 70 of whom did not receive oxytocin induction. The descriptive information form, birth process evaluation form as well as lactation status, baby's sucking behavior and initial breastfeeding assessment form and a form to evaluate the breastfeeding applications in the first 12 hours prepared by the researcher were utilized with an eye to collect data. Data were evaluated by the significance test of the difference between two averages and the chi-square test.

Results: The following were determined in women who received oxytocin induction compared with those who did not receive oxytocin induction; first breastfeeding time was later ($p=0.056$), first breastfeeding period was lower ($p=0.00$), lack of lactation was the most of the observed problem ($p=0.00$). At the end of twelve hours following were determined in women who received oxytocin induction compared with those who did not receive oxytocin induction: breastfeeding problems were more experienced ($p=0.00$), exclusively breastfeeding rate was low ($p=0.00$).

Conclusion: Therefore, special breastfeeding protocols must be created for the mothers who received oxytocin induction.

INTRODUCTION

Birth is a natural process, and for a healthier birth and postpartum period unnecessary medical intervention should be avoided. The increased use of medical interventions such as oxytocin infusion for stimulating uterine contractions can delay endogen oxytocin secretion (1). In the literature, the most common reasons for using oxytocin induction are shown in post-term pregnancies and prolonged births, but if it is used unnecessarily (elective) it can cause some risks for mother and infant (1-3). In Turkey, in most hospitals the oxytocin infusion is performed routinely, mostly without any indication.

Unnecessary exogenous oxytocin induction can increase the fetal risk of hypoxia, and can be a reason for prolonged labour. In some research, it has been determined that elective intravenous oxytocin induction can cause a 3-4 hour labour prolongation and also because of unnecessary use of medication can led up to 25% financial losses (4-7). At the same time, this infusion can increase the level of pain felt by the mother during contractions (1,8). Health professionals involved in the birth process should emphasise safety for the mother and baby as well as the emotional and psychological satisfaction of the mothers. In Turkey, maternal psychological wellbeing and satisfaction during birth, and maintaining breastfeeding are given less attention. However, all of these issues are very important for a healthy mother and baby (1,4,9,10).

Endogen oxytocin secretion is important for successful initiation and contribution of breastfeeding (2). Delayed endogen oxytocin can effect lactation. Human milk contains the ideal amount of nutrients for the infant (11). It is therefore of great importance to investigate whether exogenous oxytocin infusion influences lactation and breastfeeding. There is limited research related to this topic. In research conducted by Jordan et al. it was determined that mothers who took oxytocin infusions had statistically lower breastfeeding rates within 48 hours postpartum than mothers who did not take the induction (12). Also, in a comparative study carried out by Li Bai, it was found than oxytocin induction is associated with delayed breastfeeding duration (13). In another study, mothers who had four medical interventions during birth were compared with women who did not have any intervention, and it was determined that women in the intervention group had lower endogenous oxytocins levels during lactation at the second day postpartum (14). This medical intervention can also affect newborn activity and sucking strength. Duff and Sinclair in their retrospective comparative research found that the one- and five-minute Apgar scores were significantly lower in babies born from mothers who had oxytocin inductions as compared to mothers that had not received this intervention. Infant sucking ability is one of the factors that can be affected by a low Apgar score (15).

It is important to determine the detailed effects of exogenous oxytocin on breastfeeding so that health professionals can plan interventions for improving breastfeeding. This study was intended to find answers to the following questions: (1) is intravenous oxytocin induction delaying lactation; (2) is infant sucking ability affected by this intervention; and (3) does this intervention affect only the first breastfeeding after birth or does it have prolonged effects on breastfeeding.

METHODS

Setting and participants

A descriptive and comparative study was conducted at the Women's Health and Birth Research Hospital (a baby-friendly hospital), in Izmir, Turkey.

Data from a comparative and descriptive study by Jonas et al. were used to analyze the power (The number cruncher statistical system- Power Analysis and Sample Size -NCSS-PASS). Based on the number of breastfeeding from birth (postpartum 2 days), Type I error 0.05 (0.95 power) and Type II error 0.20 (0.80 power), it was calculated that a sample should be taken from at least 72 individuals in total from 36 pregnant women who received oxytocin induction and 36 pregnant women who did not. In line with this evaluation, a total of 140 mothers, 70 who received oxytocin induction and 70 who did not, were included in the sample, considering the losses that may occur during data collection. The sample size was predetermined by using power calculation with the G*Power program and according to the results the power of sample size was determinant as 99%. The study population consisted of 70 women who had intravenous oxytocin induced births (OIB) and 70 women who had spontaneous births (SB). The eligibility criteria for participants were primiparous and multiparous women who did not have any chronic disease or any complication during pregnancy, had given term birth to a single live infant weighing 2.500 g and above, and had not received any application of epidural anaesthesia, amniotomy, or vacuum intervention during the birth process.

Data collection

"Introductory Information Form", "Birth Process Evaluation Form", "Lactation, Baby's Sucking Behavior and First Breastfeeding Assessment Form" and "Assessment Form for Breastfeeding Practices in the First 12 Hours" were used to collect the necessary data for the study.

Introductory Information Form

Introductory information form prepared by the researcher in order to obtain information about the introductory characteristics of the mothers; It contains five multiple-choice and nine open-ended questions on introductory variables such as age, educational status, employment status, number of births, and previous breastfeeding experiences.

Birth Process Evaluation Form

In the birth process evaluation form prepared by the researcher in order to obtain information about how the mothers gave birth; It includes five multiple-choice and eight open-ended questions related to the births of mothers, such as oxytocin induction status, episiotomy status, and baby's apgar score.

Lactation, Baby's Sucking Behavior and First Breastfeeding Assessment Form

In order to evaluate the breastfeeding results of mothers, Lactation, Sucking Behavior of the Infant and First Breastfeeding Evaluation Form was prepared by the researcher in line with the literature.

The reason for choosing the first breastfeeding; The period when the baby is most awake after birth and therefore breastfeeding is most active is the first half hour after birth.

In order to determine the effect of oxytocin induction given at birth in this form on lactation; It includes twenty-one multiple-choice and three open-ended questions to determine the first breastfeeding, lactation status, sucking behavior of the baby, body position during sucking, emotional attachment, breastfeeding problems and breastfeeding level.

Evaluation Form of Breastfeeding Results in the First 12 Hours

It was prepared by researchers in line with the literature to evaluate the breastfeeding practices of mothers in the first 12 hours. The reason for choosing the first 12 hours; the second most active period of the baby occurs at these hours after birth, and during this period, the baby is awake, responds effectively to stimuli and breastfeeding is performed successfully. This form includes eight multiple-choice and six open-ended questions to determine the effect of oxytocin induction given at birth on lactation, and to determine the breastfeeding style. The data were collected in three steps. The first step was conducted during the birth process. Researchers followed up with the births and recorded notes related to the birth process. In this stage, the 'Introductory Information Form' was completed. Also with aim to ensure the follow-up of the progress of birth and newborn the "Evaluation of Birth Process" questionnaire was performed. The duration of birth, the progress of cervical dilatation and effacement, the dose of performed oxytocin, and the one- and five-minute newborn Apgar scores were recorded on this form.

In the second step, researchers used the "Lactation, Babies Sucking and First Breastfeeding Evaluation Form" for evaluating lactation immediately after birth, as well as the babies' sucking and first breastfeeding results. The evaluation form was prepared by the authors according to related literature and was also assessed for content validity by the authors, five professors in obstetric and gynaecologic nursing, and five lactation consultants. In addition, the authors had certifications related to evaluation of lactation and breastfeeding education, also the second author had PhD work related to breastfeeding. The results were evaluated by researchers by inspection and observation and also were confirmed by clinical nurse evaluations.

The third stage was conducted at the end of 12 hours postpartum and "Breastfeeding Evaluation Form" was used. To evaluate the type of breastfeeding, Labbok and Krasovec's classification was used (16).

Study Flow Chart

Stage 1-----Delivery room / Travay

* Introductory information form
(socio-demographic and obstetric characteristics)

Stage 2----- Delivery room

* Birth process evaluation form

Stage 3----- Immediately after birth in the
delivery room or clinic

* Lactation assessment form before the first
breastfeeding

* Sucking behavior form of the baby before the
first breastfeeding

* First breastfeeding results

Stage 4----- Clinic

* 12 hours breastfeeding results

* Breastfeeding styles

The study was approved by the Dokuz Eylul University (2014/07-11) ethical committee and participant signed informed consent forms.

Date analysis

Data were analysed using SPSS 22.0. The level of significance in terms of p value was 0.05. Data were presented using descriptive statistics including means, standard deviations, an independent sample t-test and a chi-square test. The chi-square and t-test were used for comparison of lactation, babies sucking, first breastfeeding, and breastfeeding at the end of 12 hours postpartum.

RESULTS

Demographic characteristics

The mean age was 26.29 ± 5.12 in the OIB group and 25.51 ± 4.02 in the SB group, and the groups was similar according to age means ($p=0.323$). Most of the women in the two groups were primary and high school graduates ($p=0.499$), and 51.4%

in the OIB group and 52.9% in the SB group were employed (p=0.866). Parity was similar between groups (p=0.629) (Table 1).

Obstetric characteristics

With regard to the number of births, the average was 1.91±1.21 for the OIB group and 1.74±0.88 for the SB group (p=0.340). Both groups were also found to be similar in terms of the total duration of breastfeeding previous babies (p=0.088). There was no significant difference related to experience of breastfeeding problems with a previous baby (p=0.794). With regard to demographic and obstetric results, there was no significant inter-

group baseline difference between the study groups (Table 1).

Birth Process and Infant

All of the women gave birth after a full-term pregnancy (p=0.572). It was observed that the duration time for the births in the OIB group was 10.35±0.69, and was a similar 10.48±0.14 in the SB group (p=0.532). A significant difference was determined related to Apgar scores at one and five minutes after birth. The Apgar scores were significantly higher in women who had SB. The birth weight of the infants was similar (p=0.227) (Table 1).

Table 1. Demographic, Obstetric Characteristics and Current Birth Data (n=140)

Variable	Group		p-Value*
	OIB group (n=70)	SB group (n=70)	
Age (mean ±SD)	26.29±5.12	25.51±4.02	0.323
Education			
Primary school	37 (52.9)	32(45.7)	0.499
High school	33 (47.1)	38(54.3)	
Employment			
Employed Non-employed	36(51.4%) 34(48.6)	37(52.9) 33 (47.1)	0.866
The number of birth (mean ± SD)	1.91 ± 1.21	1.74 ± 0.88	0.340
Total duration of breastfeeding in previous babies[‡]	17.12±5.26	14.21±6.71	0.088
Experience of breastfeeding problems with previous baby[‡]			
Yes No	10 (28.6) 25(71.4)	11 (31.4) 24 (68.6)	0.794
Week of birth (mean ±SD) *	39.24±0.69	39.17±0.79	0.572
Duration of birth (mean ±SD) *	10.35±0.13	10.48±0.14	0.532
Apgar score in 1. minute (mean ±SD) *	6.80±0.55	7.85±0.39	0.000
Apgar score in 5. minute (mean ±SD) *	7.41±0.60	8.60±0.54	0.000
Infant birth weight (mean ±SD) *	3257±325	3192±303	0.227
SD, standard deviation. aValues are given as mean ± SD, mean (range), or number (percentage) unless stated otherwise			
*(X ²) Ki-kare T testi			
[‡] Data of multiparous women * Data related to current pregnancy			

Only 20% of the OIB group had lactation, while this was 97.1% from other group ($p=0.000$). The infants of women with SB were significantly more alert when they were held for the first breastfeeding ($p=0.000$). Also, it was observed that 87.1% of infants of women in the OIB group, and 71.4% of infants of women in the SB group were searching for the breast when the babies were first held by their mother ($p=0.036$). The percentage of infants who correctly clutched the areola during the first breastfeeding in the SB group was 81.4% vs. 50.0% in the OIB group ($p=0.000$). However, in infants of women with SB, deep and slow swallowing movements were heard and observed (68.6%), but this was significantly lower (15.7%) in infants of women affected with intravenous oxytocin induction ($p=0.000$). In addition, the infants of mothers with SB were more peaceful after sucking than those from the OIB group ($p=0.000$). Women with SB were holding their infants tighter and more efficiently, allowing eye contact. Women in the OIB group were more nervous, and they were holding their infants loosely, without confidence and eye contact ($p=0.000$).

The first breastfeeding time was delayed in both of the groups. Despite that women who had SB breastfed earlier, there was no statistically significant difference between the groups ($p=0.056$). The total duration time of the first breastfeeding was longer in women with SB ($p=0.000$). According to the results, it was determined that OIB is characterised with more

breastfeeding problems when compared with SB ($p=0.000$), and the most common problem was absence of lactation. All of the women experienced similar problems related to infants' inability to latch onto the breast ($p=0.649$). Also, 94.3% of women in the OIB group were stressed, while the women in the SB group (77.1%) were comfortable during breastfeeding ($p=0.000$). After breastfeeding, women in the SB group were also more pacified ($p=0.000$). Giving a supplement other than the mother's milk during the first feeding was also higher in women with OIB ($\chi^2=9.945$; $p=0.00$) (Table 2).

Breastfeeding Results at the End of 12 Hours Postpartum

Breastfeeding problems were delayed in all participants at the end of 12 hours postpartum, compared with the first breastfeeding, but were still significantly higher in women with induced birth (IOB=45.7%; SB=2.9%) ($p=0.00$). It was found that 21.4% of these mothers still had delayed lactation and that 24.3% had problems related to infants latching onto the breast. Infants and mothers with SB were significantly more relaxed and peaceful after breastfeeding than those in the OIB group ($p=0.00$). At the end of 12 hours, all of the women in both groups reported that they were not pumping their breasts. In addition, exclusive breastfeeding was higher in women with SB ($p=0.00$). There was not any significant difference between infants' weight ($p=0.30$) (Table 3).

Table 3. Comparison of Postpartum 12 Hours Breastfeeding Results (n=140)

Variable	Group		p-Value*
	OIB group (n=70)	SB group (n=70)	
Infant status after breastfeeding			
Peaceful	46 (61.8)	68 (97.1)	0.000
Restless	24 (34.3)	2 (2.9)	
Duration of one breastfeeding (min) (mean±SD)	9.60±3.46	10.77±2.87	0.031
Breastfeeding intervals (hours) (mean±SD)	2.04±1.33	1.24±0.43	0.000
Status of mother after breastfeeding			
Peaceful	36 (51.4)	68 (97.1)	0.000
Restless	34 (48.5)	2 (2.9)	
Giving supplementary food			
Yes	36 (51.4)	3 (4.3)	0.000
No	34 (48.6)	67 (95.7)	
Infant weight (mean±SD)	3245±318	3191±302	0.308
aValues are given as mean ± SD, mean (range), or number (percentage) unless stated otherwise			*Fisher's Exact Test

DISCUSSION

It was determined that the lactation was decreased in OIB group. Jonas et al. found that women who had received oxytocin induction had lower endogenous oxytocin levels in the second day postpartum (14). Also Jordan et al., reported that 43.3% of synthetic oxytocin induced mothers had not breastfed their infants due to delayed lactation within 48 hours after the birth (12). In a retrospective cohort study by Gomes and friends; It has been shown that the use of oxytocin during labor will affect breastfeeding in the first hour (17). In another retrospective cohort study; It turns out that women who receive exogenous oxytocin for labor augmentation or induction are more likely to require formula supplements and reduce the number of breastfeeding sessions (18). According to the literature and the current study results, oxytocin induction can suppress endogenous oxytocin and can decrease milk removal from the breast which is accomplished by the contraction of myoepithelial cells that are controlled by oxytocins (19 -21). Infants of women with SB were more alert and searched more for the breast when they were first held. It was also observed that they correctly clutched the areola and showed deep and slow

swallowing movements at higher levels than infants of women with OIB. Due to correct breastfeeding techniques and that they were likely getting enough milk, infants in this group were probably more peaceful. The reason that infants of women in the OIB group showed poorer results related to sucking could be related to decrease Apgar scores. According to the literature review conducted by Smith, oxytocin induction performed during birth affects infant alertness and muscle coordination, and this can cause a reduction in the duration of breastfeeding initiation (22). It was also observed that women who had SB were more relaxed during breastfeeding compared to the OIB group. This could be related to the endogenous oxytocin effect recognised as soothing and relaxing and creates pleasant feelings. However, because synthetic oxytocin inhibits the secretion of endogenous oxytocin, it can lead women to be more nervous, like our results represented (1,2,14,23-25). Also this could be related to the greater breastfeeding problems experienced by these women. Because they have more breastfeeding problems, OIB group women expressed their breasts at a significantly higher level. Breast expression is important for maintaining lactation and milk removal. As a result, infants of women in the OIB group took

more supplements other than their mother's milk during the first feeding. Li Bai also found that medical interventions performed during birth are associated with giving higher levels of supplements (13). This may result in decreased lactation and infant sucking ability, which can affect infant satiety. At the end of 12 hours postpartum in the OIB group, the delayed lactation problem decreased as compared with the first breastfeeding, but was still significantly higher than in the SB group. Despite the improvement of the OIB group, the results were still better in the SB group. Jonas et al. determined that at the end of 48 hours postpartum, mothers had improved prolactin levels, but they still had decreased oxytocin levels as compared with a non-induction group. These results show that the effects of intravenous oxytocin induction continue into the second day postpartum (14).

The problems related to latching onto the breast continued in the second evaluation. It is thought that this problem could be associated to delayed lactation in the first hours. As a result of delayed lactation, infants probably cannot improve their reflex for holding and catching the breast, and taking supplementary products because of decreased lactation could lead to consolidation of these problems. Nevertheless, the infants of women in the SB group were still significantly more peaceful after breastfeeding. Providing toughness related to sufficient lactation can make infants peaceful. In addition, the mothers with SB were more peaceful after breastfeeding, which could be related to the satisfaction of satiated infants and improved prolactin and oxytocin, the hormones that improve good feelings. Although the OIB group improved its results compared to the first breastfeeding, the difference was still significant. As a result of all of the differences between the two groups, the women with SB had higher rates of exclusive breastfeeding.

CONCLUSION

Our study has shown that intravenous oxytocin induction during birth delays lactation, can harm infant sucking, and has an effect not only immediately after birth, but also at the end of 12 hours postpartum. This shows that health professionals should provide support to these mothers so as to prevent the continuation of these problems. Future studies for determining the prolonged effects of intravenous oxytocin induction should be conducted.

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Availability of data and materials

The datasets used during the current study are available from the corresponding author.

Authors' contributions

All authors were involved in the planning of this study.

Ethics approval and consent to participate

The study was approved by the Dokuz Eylul University (IRB No: 2014/07-11) ethical committee and participant signed informed consent forms. All participants signed a consent form before voluntarily participating in the study.

Consent for publication Not applicable.

Competing interests

The authors declare that no potential conflicts of interest exist with respect to the research, authorship, or publication of this manuscript.

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