

# The Effects of Intrapartum Oxytocin Induction on Labor Pain and Fear of Labor

## İntrapartum Oksitosin İndüksiyonunun Doğum Ağrısı ve Doğum Korkusu Üzerine Etkileri

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### ABSTRACT

**Aim:** The aim of this study is to determine the effects of intrapartum oxytocin induction on labor pain and the fear of labor.

**Methods:** This descriptive study was performed in the maternity ward of a state hospital in Turkey. The sampling of the study included 52 pregnant women who received oxytocin induction (oxytocin group) and 55 pregnant women that did not receive oxytocin (no oxytocin group) according to inclusion criteria of the study. Visual analog scales were used to determine pain severity and contraction frequency, and the Wijma Delivery Expectancy/Experience Questionnaire version B was used to determine fear of labor.

**Results:** The women in the oxytocin group had a significantly longer duration of labor, a higher pain severity score, a greater contraction frequency, and a higher level of fear of labor in the postpartum period than those in the no oxytocin group ( $p < .05$ ).

**Conclusion:** The results of this study demonstrated that oxytocin, which is used to induce or accelerate labor, caused an increase in the fear of labor as well as more frequent and more severe labor pain. The management of the pain and fear associated with oxytocin induction in labor may have a positive effect on labor outcomes.

**Keywords:** Fear, labor, oxytocin, pain, nurse.

### ÖZ

**Amaç:** Bu araştırma, intrapartum oksitosin indüksiyonunun doğum ağrısı ve doğum korkusu üzerine etkisini belirlemek amacıyla yapılmıştır.

**Yöntem:** Bu araştırma tanımlayıcı bir araştırma olup, Türkiye'deki bir devlet hastanesinin postpartum bakım servisinde yürütülmüştür. Araştırmanın örnekleme kriterlere uyan, oksitosin indüksiyonu uygulanan 52 kadın ile oksitosin indüksiyonu uygulanmayan 55 kadından oluşmaktadır. Ağrı şiddeti ve kontraksiyon sıklığı belirlemek için görsel analog skala, doğum sonrası dönemde doğum korkusunu belirlemek için Wijma Doğum Beklentisi/Deneyimi Ölçeği B versiyonu kullanılmıştır.

**Bulgular:** Oksitosin grubundaki kadınların, kontrol grubuna göre doğum sürelerinin daha fazla olduğu ve doğumdaki ağrı yoğunluğu skoru, kontraksiyon sıklığı skoru ve doğum korkusunun daha yüksek olduğu belirlenmiştir ( $p < .05$ ).

**Sonuçlar:** Bu araştırmanın sonuçları, doğumu başlatmak ya da hızlandırmak amacıyla kullanılan oksitosin indüksiyonunun doğum korkusunu artırdığını, doğum ağrısının daha sık ve fazla algılanmasına neden olduğunu göstermektedir. Doğumda oksitosin indüksiyonuna bağlı gelişen ağrı ve korkunun uygun yönetimi doğum sonuçlarını olumlu etkileyebilir.

**Anahtar kelimeler:** Korku, doğum, oksitosin, ağrı, hemşire.

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**L**abor is considered to be physiological processes in the reproductive life of a woman. However, few women note that they have positive experiences with these processes. Childbirth causes extreme physical and mental stress in women, which could be the reason for the pronounced increase in stress hormone concentrations during labor compared with their concentrations during pregnancy.<sup>(1)</sup> The release of stress hormones, such as epinephrine, norepinephrine and cortisol, generally changes in reaction to stress in humans. Epinephrine release during labor may lead to a decrease in uterine activity, whereas norepinephrine excretion can cause increased, uncoordinated and dysfunctional uterine activity.<sup>(2)</sup> Decreased uterine activity and uncoordinated and dysfunctional uterine activity cause prolonged labor, which is associated with an increased number of vaginal examinations and invasive interventions and greater maternal fatigue. Therefore, most women report that they have had unbearable pain, prolonged labor, exhaustion and hopelessness and underwent interventions to accelerate labor.<sup>(3,4)</sup>

The fear and pain during labor are the predict factors for developing stress in women.<sup>(5)</sup> Labor pain is thought to be one of the most severe types of pain, and there is widespread fear concerning labor throughout the world.<sup>(3)</sup> According to the fear-tension-pain theory of pain management, when women experience fear or stress during labor, their bodies react in a way that increases pain.<sup>(5)</sup> It has been reported that there is a correlation between fear and pain, as well as between degrees of fear and different phases of labor.<sup>(6)</sup> Although the causes of labor pain vary between women, factors that increase the severity of this pain and cause fear of labor have been determined to play a role in prolonged labor.<sup>(4,6,7,8)</sup>

Oxytocin induction is performed to stimulate the uterus for the treatment of prolonged labor. There is only limited high-quality evidence that labor induction for specific medical and obstetrical indications is beneficial.<sup>(9)</sup> The rate of induction rises due to various medical and social factors. There was an approximately twofold increase in the frequency of labor induction between 1990 and 2006, rising from 9.5% to 22.5%.<sup>(10)</sup> In a study, many of the women studied were in favor of natural birth and were opposed to labor induction.<sup>(11)</sup> However, these women changed their minds and wanted to have induction in the fortieth gestational week for several reasons: they were worried that they and their babies might develop medical problems, the physical discomfort and psycho-social fatigue due to prolonged pregnancy increased, problems with transportation, financial status and they were affected by their friends, families and maternal care providers' concerns.<sup>(12)</sup>

A portion of women may have a positive attitude toward stimulation of the uterus with oxytocin because it accelerates labor.<sup>(12,13,14)</sup> Women may have less fear during labor induction than those not undergoing induction, especially when they are involved in the decision making process.<sup>(12)</sup> However, stimulation of the uterus may cause increased discomfort due

to contractions and shorter recovery periods between contractions.<sup>(15)</sup> In a qualitative study from Turkey, women reported that oxytocin induction for uterus stimulation increased labor pain, made it difficult to cope with the pain and caused them to feel a loss of control over labor.<sup>(4)</sup> However, no quantitative research was found for these qualitative findings.

This study was conducted to determine the The Effects of Intrapartum Oxytocin Induction on Labor Pain and Fear of Labor for achieving these aims.

## Methods

### Study Design and Setting

This is a descriptive study that was performed in the maternity ward of a state hospital in Turkey between Aug 30 and Sep 30 in 2015. In the study setting, the gynecologists can decide to use oxytocin to induce or accelerate labor. The vital signs and fluid input and output were monitored in the patients administered oxytocin. In addition, fetal responses to oxytocin were evaluated with continuous electro-fetal monitoring during labor. There were no differences in supportive care offered by the nurses or midwives during oxytocin inductions in labor. Women having spontaneous vaginal birth were monitored in the postnatal care unit for 24 hours and discharged when neither they nor their babies developed complications.

### Participants

Since there was no prior any study about the effect of the oxytocin induction on the fear of labor process at the start of this study, required sample size could not be calculated at the beginning of the study. When the sample size reached ten participants in each group, power was calculated based on collected data, using Minitab 15. The primary outcome was the pain severity score. The number of the participants required for each group was determined based on a significance level of 0.05, and assumed mean differences (1.08) and standard deviations (2.743) on the data collection visual analogue scale. To achieve a study power of 80%, each group was required to include at least 51 participants. To account for potential loss to follow-up, 60 participants were assigned into each group. A total of 120 women were eligible to participate and were approached by the researcher, but 13 women declined to participate in the study (response rate: 89.16%).

The study included a total of 107 postpartum women. Inclusion criteria were having no maternal and fetal complications during pregnancy and labor, speaking and understanding Turkish, having a spontaneous vaginal birth during the 37th-42nd gestational weeks, primiparous or multiparous and being followed for 12-24 hours in the postpartum period. Fifty-two postpartum women who were administered oxytocin to induce or accelerate labor were included in the oxytocin group. Fifty-five postpartum women who did not receive oxytocin were included in the not oxytocin.

## Data Collection

Data were collected within 12-24 hours after labor because the first 12 hours during postpartum period were when the women had the fastest physiological changes, had their first breastfeeding experiences and were tired.

**Participant information form:** The data obtained from the woman and her labor file.

A participant information form was used to collect data about demographic and obstetrics characteristics, including age, education, parity, number of pregnancies, gestational week and duration of labor (hour). The woman was asked to hour of the start indicate of labor. The end of labor time was obtained from the file. The duration of labor was defined as the time between the beginning and the ending time.

**Visual analogue scale:** A visual analogue scale ranging from 0 (no pain) to 10 (pain as bad as one can image) was utilized to determine pain severity. Secondly, a visual analogue scale was used to determine contraction frequency similarly. Contraction frequency was also scored on an eleven-point scale, ranging from 0 (no contractions) to 10 (continuous contractions). These data were collected after labor retrospectively.

**The Wijma Delivery Expectancy/Experience Questionnaire B version (W-DEQ-B):** It was used to evaluate labor fear in the postpartum period. The W-DEQ-B is a 5-point Likert scale consisting of 33 items. This questionnaire helps to determine the fear of labor along with thoughts and feelings women may have after labor. The minimum and maximum scores to be obtained from this scale are zero and 165, respectively. A higher total score indicates a more intense fear of labor during the postpartum period. The internal consistency and split-half reliability of the scale are  $\geq .87$  for samples of both nulliparous and multiparous women.<sup>(16)</sup> A study exploring the validity and reliability of the Turkish version of the scale showed a notably high internal consistency ( $\alpha = .89$ ).<sup>(17)</sup> The present study found the internal consistency to be excellent ( $\alpha = .93$ ).

## Ethical considerations

Approval was obtained from the Institutional Review Board of the university located in the city where the study was conducted. Before data collection, the researcher introduced herself to the participants who met the inclusion criteria, provided them with information about the purpose and procedures of the research and guaranteed anonymity and confidentiality of all information. Written informed consent was received from all of the participants. The principles adopted in the Declaration of Helsinki were followed. The questionnaire was completed through interviewing method.

## Data Analysis

Statistical analyses were conducted using SPSS software version

13. Before selecting the statistical test, the mean of skewness and kurtosis were determined to check whether quantitative data were normally distributed. Statistical analyses were performed using Chi-square tests (Pearson Chi-square test, Yates's continuity correction, and Fisher's exact test) and independent samples t-tests to compare women's characteristics between the two groups. Independent samples t-test was used to compare pain severity scores, contraction frequencies, fear of labor during the postpartum period and duration of labor (h) between the oxytocin group and the not oxytocin group. The various hypothesis tests were accepted as significant for results with a value of  $p < .05$ .

## Results

The baseline participant characteristics of age, education, parity, number of pregnancies and gestational week were similar between the oxytocin and not oxytocin groups ( $p > .05$ ). Only, spontaneous onset of delivery ratio was determined significantly higher in the not oxytocin group (100%) than in the oxytocin group (63.6%) ( $p = .000$ ) (Table 1).

**Table 1. Baseline Characteristics of the Participants**

CHARACTERISTICS	OXYTOCİN (n=52)	NOT OXYTOCİN (n=55)	p VALUE / $\chi^2/t$
	n(%) MEAN±SD	n(%) MEAN±SD	
Age <sup>a</sup>	26.12±5.97	24.84±5.48	0.252 t=-1.153
Education <sup>b</sup>			
Primary education	42 (76.4)	42 (80.8)	0.579
High school or University program	13 (23.6)	10 (19.2)	$\chi^2=0.307$
Parity <sup>c</sup>			
Primiparous	20 (36.4)	15 (28.8)	0.534
Multiparous	35 (63.6)	37 (71.2)	$\chi^2=0.387$
Number of pregnancies <sup>a</sup>	2.60±1.74	2.67±1.47	0.816 t=0.816
Gestational week <sup>a</sup>	39.58±1.13	39.15±1.43	0.089 t=-1.718
Spontaneous onset of delivery <sup>d</sup>			
Yes	35 (63.6)	52 (100)	0.000
No	20 (36.4)	0 (0)	$\chi^2=9.72$

<sup>a</sup>Independent t-test <sup>b</sup>Pearson Chi-square <sup>c</sup>Yates's Continuity Correction <sup>d</sup>Fisher's Exact Test

The duration of labor (h) was significantly longer in the oxytocin group (11.41 ± 7.11) than that of in the not oxytocin group (8.69 ± 6.27) ( $p = .038$ ) (Table 2). In addition, oxytocin was used to start labor in 36.4% of the women (n=20) and to accelerate labor in 63.6% of the women (n = 35) in the oxytocin group. In fact, the duration of labor was 10.60 ± 6.43 in the group which oxytocin was used to induce labor and 11.88 ±

7.52 in the other group in which oxytocin was used to accelerate labor and the duration of labor did not differ significantly between these two oxytocin groups of women ( $t = 0.641$ ,  $p = .524$ ).

The pain severity score was significantly higher in the oxytocin group ( $8.38 \pm 2.10$ ) than in the not oxytocin group ( $7.36 \pm 2.48$ ) ( $p = .024$ ). In addition, the contraction frequency was significantly higher in the oxytocin group ( $8.05 \pm 1.84$ ) composed to not oxytocin group ( $6.51 \pm 2.33$ ) ( $p = .000$ ) (Table 2). The fear of labor score was determined significantly higher in the oxytocin group ( $68.61 \pm 33.12$ ) opposed to not oxytocin group ( $50.80 \pm 33.28$ ) ( $p = .007$ ) (Table 2).

**Table 2.** Comparison of Duration of Labour, Pain Severity Scores, Contraction Frequencies and Fear of labour after childbirth in Oxytocin and Not oxytocin Groups

CHARACTERISTICS	OXYTOCIN (n=52)	NOT OXYTOCIN (n=55)	P VALUE /t
	MEAN±SD	MEAN±SD	
Duration of labour (h) <sup>a</sup>	11.41±7.11	8.69±6.27	0.038 t=-2.097
Pain severity score <sup>a</sup>	8.38±2.10	7.36±2.48	0.024 t=-2.290
Contraction frequency <sup>a</sup>	8.05±1.84	6.51±2.33	0.000 t=-3.785
Fear of labor after childbirth <sup>a</sup>	68.61±33.12	50.80±33.28	0.007 t=-2.773

<sup>a</sup>Independent t-test

## Discussion

This study revealed that the duration of labor was longer and that the pain severity score, the contraction frequency and the fear of labor score were higher in the women receiving oxytocin than in those not receiving oxytocin.

One limitation of this study is that the data on labor pain, frequency of contraction and fear of labor were not collected at the time of labor but were collected within 12-24 hours in the postpartum period. It can be recommended that in future studies, these data should be collected in different phases of labor, i.e., during the latent phase, active phase, transitional phase and second stage.

In the present study, the duration of labor was significantly longer in the oxytocin group than in the not oxytocin group. However, there was not a significant difference in the duration of labor between the women receiving oxytocin to induce labor and those receiving oxytocin to accelerate labor. In the hospital where this study was conducted in general women receiving oxytocin exposed to continuous electro-fetal monitoring to reveal any side-effects of the oxytocin on the fetuses. Therefore, they become confined to bed. In light of the literature, it is clear that walking and upright positions in the first stage of labor

reduces the duration of labor.<sup>(18)</sup> Prolonged labor in women given oxytocin to accelerate labor may result from the women's inability to move, which is not a desirable outcome. Therefore, these women should be encouraged to stay upright and walk.

In an article, the women with high and very high anxiety levels were all primiparous. A high and very high level of labor anxiety were noted in 11.7% of women.<sup>(19)</sup> Women with fear of labor suffer from more severe pain and have a prolonged birth process, which reduces their satisfaction with labor.<sup>(20,21)</sup> Stress hormones released due to fear lead to decreased, uncoordinated, and dysfunctional uterine activity and prolonged labor.<sup>(2)</sup> It has been reported that oxytocin induction used to accelerate labor causes intense fear of labor and makes coping with pain difficult.<sup>(4)</sup> In the current study, the women in the oxytocin group had more frequent contractions, higher pain severity scores and higher fear of labor after labor scores. It has been stated that the nursing care provided to women stimulated with oxytocin and those not stimulated should differ because of the differences in labor experiences.<sup>(22)</sup> Nurses could offer continuous supportive care to women who need oxytocin to minimize the harmful effects of oxytocin on maternal and fetal health and on the labor process. Supportive care reduces fear and perceived pain in labor and shortens the length of labor.<sup>(23)</sup> Supportive care offered by nurses and midwives during labor involves physical support and comfort, emotional support, instructional/ informational support, and advocacy support.<sup>(24,25)</sup> Non-pharmacological pain management methods (breathing, relaxation, labor position, acupressure, etc.) could also be taught to women receiving oxytocin induction to provide physical support and comfort and the women could also be encouraged to implement these methods. To provide emotional support, pregnant women could first be interviewed to determine whether they have fear of labor pain and oxytocin, and then nursing and midwifery interventions directed toward pain management and elimination of the cause of fear could be offered. Instructional/ informational support should involve a detailed explanation of the aim of oxytocin induction, involvement of women in decision making for oxytocin induction and creation of a positive attitude towards this intervention. It is thought that when women receiving oxytocin induction are given continuous supportive care by nurses and midwives, women's fear of oxytocin use and their perceived labor pain can decrease, and the duration of labor can be shortened. Unless there are complications, frequent maternal and fetal monitoring and allowing spontaneous onset of birth can reduce the amount of oxytocin used. Consequently, a cost-effective outcome could be achieved and maternal and fetal effects of oxytocin could be avoided.

## Conclusion

Women and health professionals providing support for labor expect that birth should start and occur spontaneously, should not require any medical interventions and should not harm maternal and fetal health. However, in certain cases, oxytocin

induction is needed. The present study showed that the duration of labor was longer, the pain severity score and the contraction frequency were higher and fear of labor after labor was greater in the women who were administered oxytocin to stimulate the uterus. Therefore, nurses and midwives should offer continuous supportive care during labor to reduce the side-effects of oxytocin induction on women and the labor process. In addition, women should be given information about labor processes. Fear related to oxytocin induction can be relieved during pregnancy and women should be informed regarding interventions directed toward achieving physical and emotional comfort during oxytocin-induced labor.

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