Effects of oxytocin therapy on amount of breast milk in postpartum period in Maternity Teaching Hospital

Ismail Bilal Ismail

Correspondence:
Ismail Bilal Ismail
Hawler Medical University, College of Nursing and Midwifery,
Erbil,
Kurdistan Region - Iraq
Email: ismail.bilal@nurhmu.edu.krd

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Abstract

Background and objective: Early exclusive breastfeeding right after birth plays a significant role in growth and health of neonates; however, a large number of women fail to breastfeed their infants. The present study was aimed at investigating the effects of oxytocin therapy on amount of mother's milk in the postpartum period in the Maternity Teaching Hospital in Erbil, the Kurdistan Region of Iraq.

Methods: In the present quantitative investigation, a control-case study design was utilized. It was carried out on 40 breastfeeding mothers immediately after delivery. They were divided into two groups, a case group and a control group. The case group received oxytocin 10 IU during the third stage of labor, while the control group did not. The required demographic data were collected through direct interviews with the mothers, and the amount of their breast milk was determined by pumping 2 hours and 1 week after delivery. The collected data were analyzed using descriptive statistics including frequency and percentage through SPSS 22.0.

Results: The results of the present study indicated that although the case group was given oxytocin 10 IU during the third stage of labor, they did not differ from the control group who received nothing, in regard to the normal amount of their breast milk 2 hours after delivery. One week after the delivery however, the normal amount of breast milk was higher in the case group than the control group, such that 6 mothers in the case group, while only 3 in the control group, had a normal amount of breast milk.

Conclusion: According to the results of the present study, it was concluded that the mothers who had received oxytocin had a significantly higher level of breast milk than the control group; therefore it is recommended it be given to mothers who are diagnosed with probable low amount of breast milk.

Key words: oxytocin, breast milk, breastfeeding, postpartum period

Introduction

Evidence provided by research studies has shown that growth, development, and health of neonates greatly depend on their adequate nutrition during infancy, and that breast milk plays a great role in providing the infants with adequate nutrition [1, 2]. Research has revealed that the rate of mortality caused by infectious diseases is higher among children under 5 years of age who have poor exclusive breastfeeding during their infancy [3]. Despite the significance of breastfeeding during infancy, only 42% of mothers worldwide have been reported to initiate early breastfeeding after childbirth; therefore, 68% of neonates are not fed adequately immediately after birth [4]. Different rates of successful initiation of breastfeeding during the first hours after birth have been reported. For example, 57% of mothers in Qatar, 46% in Uganda, and 29.8% in Kuwait succeeded in carrying out early breastfeeding after delivery [5-7]. Failure to breastfeed has been attributed to lack of breast milk as a result of various maternal, infant, sociocultural, and psychological factors. Included among these factors are the mothers' psychological state, such as depression, stress, and lack of confidence [8]. However, research studies have indicated that stimulation of prolactin and oxytocin hormone can lead to an increase in the production of breast milk [9]. It is also argued that early lactation during the first hour following birth leads to a rise in prolactin which in turn increases milk production if the breast empties completely [10].

Oxytocin is a small neuropeptide that consists of 9 amino acids [11]. Numerous studies have shown that oxytocin plays a great role in regulating social behavior [12-14]. During the first and second stages of labor, as reported by relevant studies, maternal plasma oxytocin experiences a significant increase, but it decreases during the third stage of labor [15]. It is also reported that as a result of being stretched and reacting to hormonal milieu, particularly estradiol, the uterus produces local oxytocin which causes oxytocin levels to decrease suddenly following childbirth [16].

Research has revealed that synthetic oxytocin administered to mothers during labor can increase the level of prolactin [17, 18]; however, results have indicated that intrapartum administration of synthetic oxytocin can lead to incidence of some psychological outcomes such as anxiety and depression two months following childbirth [19].

The relationship between oxytocin administration during different stage of labor and the initiation of lactation and duration of exclusive breastfeeding has been shown in numerous research studies [20-23]. It has also been pointed out that synthetic oxytocin can interfere with the development of the fetal oxytocin system by reaching brain receptors, causing changes in the neonate's behavior [24, 25]. Moreover, it has been indicated that women who are administered synthetic oxytocin in the third stage of labor are less likely to succeed in establishing attachment and breastfeeding patterns [26].

Most relevant studies have focused on the effect of oxytocin on onset of lactation immediately after labor, duration of breastfeeding, and consequences during months following the labor. However, the amount of breast milk as a result of oxytocin administration after labor has not been focused on. In this regard, the present study was carried out in order to investigate the effects of oxytocin therapy using oxytocin 10 IU on the amount of breast milk in the postpartum period in mothers attending the Maternity Teaching Hospital in City, the Kurdistan Region of Iraq.

Materials and Methods

Study design and setting

The present experiment was a quantitative study which was carried out using a case-control design. It was conducted in the Maternity Teaching Hospital in Erbil, the Kurdistan Region of Iraq over a period of 6 months from November 2015 to April 2016.

Participants and intervention

The present experiment was carried out on 40 breastfeeding women immediately after their delivery in the Maternity Teaching Hospital in Erbil, the Kurdistan Region of Iraq. They were healthy, underwent full term labor, and their age ranged from 18 to 38 years. They were randomly assigned into two groups, a case group and a control group. Each group consisted of 20 women who were homogenous regarding their age and multi-parity. The case group received oxytocin 10 IU during the third stage of labor, while the control group did not.

Instruments

To collect the participants' demographic data for further analysis, a questionnaire was utilized to carry out direct interviews with mothers. Gloves, syringe, and a manual pump were used to measure the amount of breast milk per feeding 2 hours and 1 week after delivery. The breast milk amount in the two groups was compared and expressed as "normal" or "less than normal".

Data analysis

The collected data were analyzed through descriptive statistics (including frequency and percentage). In so doing, SPSS 22.0 was employed.

Ethical consideration

The ethical approval of the present study was obtained from the Ethics Committee of College of Nursing and Midwifery, Hawler Medical University. Before starting the experiment, the researcher explained the methods and objective of the study to the President of the Maternity Teaching Hospital in Erbil, and necessary permission was provided. Afterwards, the would-be participating mothers were given a thorough explanation on the study's method and objectives, and were assured about the confidentiality of their information and their freedom to quit the study whenever they wanted to. Finally, those mothers who were willing to participate in the experiment were included in the study.

Results

The results of the present study indicated that the participants' age range was 18 to 38 years with the highest frequency belonging to the age group 25-31 (37.5%) followed by 32-38 (32.5%) and 18-24 (30.0%). With regard to their level of education, just over a half of the participants (52.5%) had primary education followed by illiteracy (32.5%), high school (15.0%), and college and higher (0%). The results also showed that 55% of the participants lived in urban areas, while 45% lived in rural regions (See Table 1).

According to the results of the present study, most of the participants (60%) were experiencing their second labor (multigravida), and 40% of them were experiencing their fifth or more childbirth (grand multigravida). It was also observed that 29 women (72.5%) had multipara and 11 (27.5%) had experienced grand multipara. Moreover, the results revealed that most of the participants (60%) had not experienced abortion, 11 women experienced it once, 4 had it twice, and 1 underwent it three times. With regard to the neonates' birth weight, it was seen that most of them (85.0%) had normal weight. Regarding the infants' sex, 23 (57.5%) were male and 17 (42.5%) female. Regarding the mothers' previous labor type, the results showed that most of them (60%) had normal vaginal delivery, 37.5% had normal vaginal delivery with episiotomy, and only 1 woman had experienced cesarean section. It was also observed that most of the mothers (82.5%) had breastfeeding experience. The results also showed that 67.5% of the mothers were skilled at feeding. Furthermore, half of them received oxytocin, while half of them did not. Measuring the amount, 2 hours after delivery indicated that normal amount of colostrum was not observed in any of the mothers. However, one week after delivery, normal amount of breast milk (30 ml) was seen in 7 women, and the milk was given to the babies (17.5%) (See Table 2).

The amount of breast milk among the mothers in the case and control groups was measured 2 hours and 1 week after the delivery. Analyzing and comparing the measured amounts indicated that none of the mothers had a normal amount of colostrum 2 hours after their childbirth. However, 1 week after the delivery, as the results revealed, 6 mothers in the case group and 3 in the control group had normal amounts of breast milk (See Table 3).

Table 1: The participants' demographic information

		Frequency	Percentage
Age group	18-24	12	30.0
	25-31	15	37.5
	32-38	13	32.5
Level of education	Illiterate	13	32.5
	Primary	21	52.5
	High school	6	15.0
	College and higher	0	0.00
Residency	Rural	18	45.0
	Urban	22	55.0

Table 2: The participants' obstetric properties and history

		Frequency	Percentage
Gravida	Primigravida	0	0.00
	Multigravida	24	60.0
	Grand multigravida	16	40.0
Para	Primipara	0	0.00
	Multipara	29	72.5
	Grand multipara	11	27.5
Abortion	0	24	60.0
	1	11	27.5
	2	4	10.0
	3	1	2.5
Weight of neonate	Underweight	1	2.5
	Normal weight	34	85.0
	Overweight	5	12.5
Sex of neonate	Male	23	57.5
	Female	17	42.5
History of previous labor	NVD	24	60.0
	NVD with episiotomy	15	37.5
	C-section	1	2.5
History of previous breastfeeding	No	7	17.5
	Yes	33	82.5
Skill at feeding	No	13	32.5
	Yes	27	67.5
Receive oxytocin	No	20	50.0
	Yes	20	50.0
Breast milk amount 2 hour after labor	Less than normal	40	100.0
	Normal	0	0.00
Breast milk amount 1 week after labor	Less than normal	33	82.5
	Normal	7	17.5

Table 3: The amount of breast milk among the mothers 2 hours and 1 week after delivery

Stage	Group	Breast milk amount	
		Less than normal (N.)	Normal (N.)
Two hours after delivery	Case group	20	0
	Control group	20	0
One week after delivery	Case group	14	6
	Control group	17	3

Discussion

The results of the present study revealed that administration of oxytocin 10 IU during the third stage of labor did not provide any changes in breast milk amount 2 hours after labor; however, a significant increase in the amount of breast milk was observed after 1 week following its administration.

The effects of oxytocin on different dimensions of human behavior, such as maternal bonding, socialization, and sexual behavior, have been considered in numerous studies [27-29]. Moreover, the significant impact of endogenous oxytocin on the initiation of lactation and psychological processes involved in lactation duration has long been known [30], but there are few studies that have focused on the influence of administering synthetic oxytocin (such as oxytocin 10 IU) during the third stage of labor on lactation onset, lactation duration, and lactation amount [31, 32]. The results of the present study indicated that none of the mothers in the case group that received oxytocin 10 IU and the control group that received nothing during the third stage of labor had a normal amount of colostrum 2 hours after delivery; therefore, there was no significant difference between the two groups in terms of the amount of their breast milk 2 hours after delivery. This finding suggests that administering synthetic oxytocin during the third stage of labor does not influence the initiation of breast feeding. Similar findings have been reported by other research studies [33, 34] which contributed delayed onset of lactation to individual factors such as socioeconomic status, smoking, education level, and physiological conditions. Delayed onset of lactation among mothers who receive synthetic oxytocin has also been reported in other studies [35].

Measuring the amount of breast milk 1 week after delivery revealed that the case group that had been given oxytocin 10 IU during the third stage of labor had a higher amount of breast milk compared to the group that received nothing during labor. This finding is in line with the results of the study carried out by Muliani who reported an average amount of breast milk secretion of 40.83 ml as a result of administration of synthetic oxytocin (as cited in Hesti et al. [35]). In their study focusing on the effect of synthetic oxytocin along with breast massage, Hesti et al. observed an increase in the volume of breast milk secretion among those mothers who had received synthetic oxytocin and breast massage [35]. Research has indicated that although administration of synthetic oxytocin increases the volume of breast milk secretion, it has a negative impact on lactation duration [20, 35]. However, the effect of oxytocin on duration of lactation was not taken into account in the present study; therefore, no comparison can be made in this regard.

Limitations of the present study

One of the limitations of the present study was that psychological factors were not taken into account, which may have a great influence on onset, duration, and amount of breast milk. Another limitation was that the amount and duration of breastfeeding were not followed up after 1 week; therefore, no conclusion was made in this regard.

Conclusion

The results of the present study indicated that the mothers in the case group who had been given oxytocin 10 IU had a significantly higher amount of breast milk than the control group. Therefore, obstetricians are recommended to give synthetic oxytocin (such as oxytocin 10 IU) to those mothers who are diagnosed with the possibility or history in the case of mulitgravida of low amount or lack of breast milk so as to ensure the infants' short- and long-term health.

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