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Original Article

A comparative study of bilateral and unilateral early sucking within 2 hours of delivery on lactation

Guoxia Zhou[1], Jun Han[2], Wenling Zhao[3], Xiaoqin Xu[4]

[1]Department of Obstetrics and Gynecology, Jiaozhou Central Hospital of Qingdao, Shandong 266300, China; [2]Department of Obstetrics and Gynecology, Qingdao Eighth People's Hospital, Qingdao 266100, Shandong, China; [3]Department of Obstetrics and Gynecology, Jiaolai Town Central Health Center of Jiaozhou City, Jiaozhou 266300, Shandong, China; [4]Department of Radiology, Taizhou Municipal Hospital, Taizhou 318000, Zhejiang, China

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Abstract: Objective: This study explored and analyzed the effects of bilateral and unilateral early sucking within 2 h after delivery on lactation. Methods: From August 2019 to August 2020, 392 primiparas with full-term, singleton, natural delivery, and normal breast conditions were submitted to the Obstetrics Department of our hospital and were enrolled as the research subjects. The subjects were randomly divided into an experimental group and a control group, with 196 in each group. Both groups implemented early sucking with the assistance of a midwife within 2 h after delivery. The experimental group conducted bilateral breast sucking and the control group received unilateral sucking. The onset time of colostrum, the lactation volume, and the prolactin levels at 6 h, 24 h, 48 h, and 72 h after delivery, including neonatal urination and incidence of complications were compared between the two groups. Results: The onset time of colostrum in the experimental group was much earlier than that in the control group with a statistically significant difference (P<0.05). The postpartum filling time of the experimental group was shorter than that of the control group, with a statistically significant difference (P<0.05). There was a statistically insignificant difference in the distribution of lactation yield between the two groups at 6 h of postpartum (*P>0.05*). The lactation yield distribution in the experimental group at 24 h, 48 h, and 72 h was critically superior to that in control group, with statistically significant difference (*P<0.05*). The degree of prolactin in the experimental group was higher than that in the control group (*P<0.05*). There was no significant difference in urination frequency and the incidence of complications between the two groups of neonates at 24 h, 48 h, and 72 h (*P>0.05*). Conclusion: The effect of bilateral early lactation within 2 h after delivery is superior to that of unilateral early lactation, which is worthy of clinical application.

Keywords: Bilateral early sucking, unilateral early sucking, lactation volume

Introduction

Breast milk is the most ideal natural nutritious food for neonates. Breast milk is rich in protein and immune substances. This milk provides nutrients required for neonates to grow, and also promotes body immunity and healthy developmental progress [1, 2]. Improving the success rate of breastfeeding as much as possible is of great significance to neonates' health, and providing adequate breast milk is also an important guarantee for the success of breastfeeding [3]. Lactic secretion is not only connected with the multiple hormones such as prolactin, adrenal cortex hormone, and progesterone in the blood of pregnant females during pregnancy but is also closely related to early sucking of neonates [4, 5]. According to WHO, early mother-to-child contact and sucking after delivery are the primary keys to the success of breastfeeding. Early contact refers to neonates having the umbilical cord cut, removing the amniotic fluid, blood stains, and plantar fat from the body, and lying prone on the mother's chest within 2 h, with their chest and abdomen close to mother's chest and abdomen. Early sucking refers to the mother embracing the baby to suck the nipples for over 30 min [6, 7]. Early postpartum skin contact and sucking can promote early emotional and spiritual communication between mother and baby, and effectively promote early and sufficient lactation [8].

There is no clear guidance provided by WHO on whether the neonates should suck one or both sides of the breasts for more than 30 min. In most previous studies, scholars primarily focused on the influence of early sucking and non-early sucking on lactic production. There was little research on bilateral and unilateral early sucking on the promotion of lactation. We selected 392 primiparas with full-term, singleton, natural delivery, and normal breast conditions, who were in the Obstetrics Department of our hospital during August 2019 to August 2020, as research objects and divided them into two groups. The two groups of primiparas conducted bilateral and unilateral early sucking by neonates respectively. Lactation provided more specific guidance for clinical work.

Material and methods

Research objects

From August 2019 to August 2020, 392 primiparas with full-term, singleton, natural delivery, and normal breast conditions in the Obstetrics Department of our hospital were enrolled as the research subjects. The subjects were randomly divided into an experimental group and a control group with 196 in each group. The experiment was carried out under the approval of our hospital ethics committee.

Inclusion and exclusion criteria

Inclusion criteria: (1) All subjects included were primiparas who gave birth to full-term, single fetus, and undergone natural delivery. (2) Subjects that voluntarily accepted breast feeding, had no contraindications to breast feeding, and no breast defects of flat or sunken nipples, or endocrine diseases. (3) Subjects that had no serious pregnancy complications or postpartum complications. (4) Neonates without congenital malformation, serious disease, or viral infection. (5) Those primiparas and their family members realized the importance of early contact and sucking and volunteered for participation.

Exclusion criteria: (1) Primiparas who cannot feed within 2 h due to uterine rupture or hemorrhage; (2) Neonates who cannot suck within 2 hours due to asphyxia at birth; or (3) Neonates supported with auxiliary ventilator after birth.

Methods

Both groups were trained on breastfeeding knowledge and skills before delivery, informed of the benefits of early contact with neonates, and the contacting methods and skills. After delivery, the neonates were routinely treated by the midwife in strict accordance with the requirements of midwifery assessments. The midwife disinfected the broken end of the neonates' umbilical cord, wiped its entire body, cleaned the fetal fat on the soles of their feet, and measured the length and weight. After the completion of the overall body evaluation, the midwife placed the neonates next to the mother's chest for the naked skin contact, and then covered the neonates with a warm bag. Midwives who had undergone professional training in breastfeeding assisted the primiparas to perform early sucking within 2 h after the fetus was delivered. The midwife placed the neonate mandible close to the mother's breast, assisted the neonate moving its lip to the mother's nipple to stimulate the foraging reflex. The midwife observed the mouth movements of the neonate, and put the nipple and most of the areola into its' mouth in time. During sucking, the head and neck of the neonate were slightly extended to avoid breast pressing of breath by the mother. The experimental group carried out bilateral breast sucking alternately, with each breast sucked for over 15 min and replaced to the opposite side until the baby gave up sucking. The control group received unilateral breast sucking, and one breast was chosen to suck for over 30 min until the baby gave up sucking.

Observation of indexes

(1) We compared the onset time of colostrum and postpartum filling time of breast between the two groups and set the time from delivery of placenta to the first overflow of breast milk as the onset time of colostrum [9]. (2) We compared the lactation of the two groups at 6 h, 24 h, 48 h, and 72 h after delivery. The method of manual milking was used to observe the overflow state of the breast milk. If the breast milk spouted, the neonate showed with quietness and satisfaction after breastfeeding. The primiparas had a sensation of breast swelling between breastfeeds, inferring that there was sufficient lactation. If there was breast milk overflow, the neonate was satisfied after breastfeeding, and the primiparas did not have

Table 1. Comparison of general data between two groups of parturients ($\overline{x}$±s)

Items	Control group (n=196)	Experimental group (n=196)	X^2/t	*P*
Age (yd)	28.47±3.13	28.97±2.56	1.9735	0.0491
Gestational week (week)	39.12±1.48	39.27±1.17	1.1131	0.2663
Total time of labor (min)	498.75±143.28	494.57±142.97	0.2891	0.7726
Weight of neonates (g)	3817.35±267.42	3828.64±259.73	0.4240	0.6718

Table 2. Comparison of onset time of colostrum and postpartum filling time of breast between the two groups ($\overline{x}$±s, h)

Group	Onset time of colostrum	Postpartum filling time of breast
Control group (n=196)	2.45±0.23	65.63±8.37
Experimental group (n=196)	2.12±0.28	45.78±6.25
t	12.7500	26.6034
P	<0.001	<0.001

breast distension between breastfeeds. Then it referred to the moderate lactic production. If only a small amount of yellow milk spilled, the neonate was not satisfied after lactation. It indicated that the amount of lactation was insufficient [10]. (3) The changes of prolactin levels before delivery and 6 h, 24 h, 48 h, and 72 h after delivery were compared between the two groups. We collected 3 ml of the primiparas' venous blood before delivery and 6 h, 24 h, 48 h, and 72 h after delivery respectively for heparin anticoagulation and stored it into a -20°C refrigerator for measuring. The plasma prolactin level at different times of the two groups of primiparas were measured strictly in accordance with the instructions. The prolactin ELISA kit was purchased from Shanghai Enzyme Link Biotechnology Co., Ltd. (4) The urination frequency between the two groups of neonates were compared according to the minimum urination standard of breast fed neonates. The urination frequency of neonates in 24 h was > 1 time, 48 h > 2 times, and 72 h > 3 times [11]. (5) The incidence of complications in the two groups of neonates was compared.

Statistical analysis

We applied SPSS19.0 statistical software for statistical analysis and processing of data. The measurement data was expressed by ($\overline{x}$±s), the comparison between groups was by *t*-test of independent samples, the enumeration data was expressed by percentage, and the results were by X^2 test. *P<0.05* referred to the statistically significant of the difference. The graphic software was by Graphpad prism9.

Results

Clinical data

The comparison of the general information between the two groups was not statistically significant (*P>0.05*) and was comparable, as shown in **Table 1**.

Comparison of onset time of colostrum and postpartum filling time of breast between the two groups

The onset time of colostrum in the experimental group was remarkably earlier than that in the control group, and the difference was statistically significant [(2.12±0.28), (2.45±0.23), t=12.7500, *P*=0.0000]. The postpartum filling time of the experimental group was shorter than that of the control group, with statistically significant difference [(45.78±6.25), (65.63±8.37), t=26.6034, *P*=0.0000], as shown in **Table 2**.

Comparison of lactic yield at 6 h, 24 h, 48 h, and 72 h between the two groups of primiparas

There was a statistically insignificant difference in the distribution of lactic yield between the two groups at 6 h postpartum (*P>0.05*). The distribution of lactic yield of experimental group at 24 h, 48 h, and 72 h was critically superior to that of the control group with statistically significant difference (*P<0.05*) (**Table 3**).

Comparison of prolactin levels before delivery and 6 h, 24 h, 48 h, and 72 h after delivery between the two groups

There was no significant difference in prolactin level between the two groups at 6 h after postpartum (P>0.05). The prolactin levels at 24 h, 48 h, and 72 h after delivery in both groups was

Table 3. Comparison of lactic yield at 6 h, 24 h, 48 h, and 72 h between the two groups of parturients after delivery (cases)

Lactic yield	6 h after delivery		24 h after delivery		48 h after delivery		72 h after delivery	
	Control group (n=196)	Experimental group (n=196)	Control group (n=196)	Experimental group (n=196)	Control group (n=196)	Experimental group (n=196)	Control group (n=196)	Experimental group (n=196)
Sufficient lactation	62	76	63	91	84	122	112	161
Moderate lactation	92	82	111	87	101	71	78	36
Hypogalactia	42	38	22	18	11	3	6	0
X^2	2.1950		8.400		16.8137		30.2662	
P	0.3337		0.0150		<0.001		<0.001	

Table 4. Comparison of prolactin levels at different time after delivery between the two groups ($\bar{x}$±s, μg/L)

Group	6 h After delivery	24 h After delivery	48 h After delivery	72 h After delivery
Control group (n=196)	201.78±28.71	264.79±33.47*	315.64±35.43*,#	429.38±41.46*,#
Experimental group (n=196)	205.55±29.16	289.51±36.38*	374.91±36.25*,#	506.17±44.73*,#
t	1.2898	7.0008	16.3701	17.6270
P	0.1979	<0.001	<0.001	<0.001

Note: compared with before delivery, **P<0.05*; compared with 24 hours after delivery, *#P<0.05.*

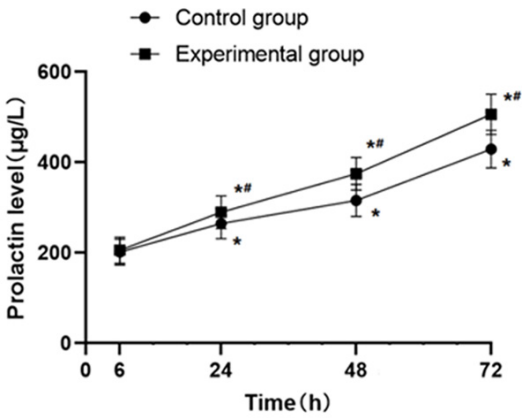

Figure 1. Comparison of prolactin levels at different times after delivery between the two groups. Note: Compare with 6 h after delivery, *P<0.05; Compare with control group, #P<0.05.

critically increased. The increase in the experimental group was higher than that in the control group, with a statistically significant difference (*P<0.05*) (**Table 4** and **Figure 1**).

Comparison of urination frequency between two groups of neonates

There was a statistical insignificant difference in the urination frequency between the two groups of neonates at 24 h, 48 h, and 72 h after birth (*P>0.05*). See **Table 5** for details.

Comparison of incidence of complications between the two groups of neonates

There was no significant difference in the incidence of complications between the two groups of neonates (10.20%, 12.24%, X^2=0.4096, *P*=0.5222), see **Table 6** for details.

Discussion

Breastfeeding is currently recognized as the optimal feeding method in the medical community. Colostrum not only contains abundant protein to guarantee the growth and development of newborns but is also rich in a variety of immune substances. The content of immunoglobulin in colostrum is 20-40 times that of mature breast milk. Breastfeeding can achieve the first immunization to enhance the immunity of neonates. In addition, colostrum also contains lysozyme and complex ferritin, which can resist viral and bacterial infections [12, 13]. In the past, the traditional way of breast-feeding was to breastfeed the baby after the primiparas naturally secreted breast milk. In consideration of stabilizing the vital signs of neonates and complication of primipara after delivery, the medical staff would send the newborn directly to the nursery for monitoring. As a result, the neonates could only suck breastmilk for the first time 6 h after delivery. Although this method improved the postpartum safety of mother

Table 5. Comparison of urination frequency between two groups of neonates (cases)

Lactic yield	24 h After delivery		48 h After delivery		72 h After delivery	
	Control group (n=196)	Experimental group (n=196)	Control group (n=196)	Experimental group (n=196)	Control group (n=196)	Experimental group (n=196)
The frequency of urination met the minimum standard	165	173	175	180	189	192
The frequency of urination did not meet the minimum standard	31	23	21	16	7	4
X^2	1.3745		0.7461		0.8418	
P	0.2410		0.3877		0.3589	

Table 6. Comparison of related complications between the two groups of neonates [cases (%)]

Group	Jaundice	Emesis	Eczema	Diarrhea	Respiratory infection	Total incidence
Control group (n=196)	8 (4.08)	4 (2.04)	3 (1.53)	5 (2.55)	4 (2.04)	24 (12.24)
Experimental group (n=196)	7 (3.57)	4 (2.04)	2 (1.02)	4 (2.04)	3 (1.53)	20 (10.20)
X^2						0.4096
P						0.5222

and baby, it has caused a great impact on the breast filling of primiparas and the early nutrition of newborns [14, 15]. Some neonates were fed sugar water or milk powder before their mothers' breast milk secretion. This caused the newborns to create an illusion of a nipple and refuse to suck breast milk. It also caused neonates to have a lack of appetite, reducing their craving for breastmilk, which led them refuse to suck [16]. Mothers would also be depressed, reduce their confidence in breastfeeding, and affect the lactation.

With the rapid development of health medicine in recent years, people have gradually realized the importance of early mother-to-child physical and psychological communication. The concept of "early contact and early sucking" has attracted great attention in the field of clinical obstetrics. Compared with the traditional mode of breastfeeding, the early contact and sucking has the following advantages: (1) It reinforces the foraging and sucking reflexes of newborns. (2) It helps the primiparas lactate as early as possible. Although the amount of postpartum milk is limited, the sucking of newborn can effectively stimulate the nipple. This stimulation is transmitted to the hypothalamus through sensory afferent nerve, triggers the excitation of hypothalamus, pituitary and prolactin axis, and promotes the secretion of breast milk in turn. The early sucking can also stimulate the neurohypophysis to release oxytocin and promote the milk ejection through the milk duct and nipple [17, 18]. (3) It reduces the incidence of postpartum complications. The early skin contacts between mother and neonate can help to calm the tense mood of primiparas and effectively enhance the emotional communication between mother and baby. The sucking can also cause the increase of oxytocin in primiparas, enhancing uterine contraction force to facilitate smooth delivery of placenta, and reducing the postpartum bleeding [19, 20]. The sucking can empty the primiparas' breast milk, thus inhibiting breast obstruction and reducing the incidence of acute mastitis [21]. (4) The early contact and sucking can reduce the incidence of hypoglycemia and infection of the respiratory system, digestive system, and skin in normal newborns. Colostrum secreted by mothers after delivery is rich in protein, vitamins, carotene, minerals, and immune antibodies These nutritional ratios meet the growth needs of newborns [22], improves their immune function, and reduces the incidence of complications of newborns.

In most previous studies [23-25], the onset time of colostrum in primiparas in early contact and sucking group was earlier than that of the non-early contact and sucking group, and the amount of lactation was also higher than that of the non-early contact and sucking group. This shows that early contact and sucking are crucial measures to promote the realization of breastfeeding [26]. This study is a further exploration based on previous studies, which aimed to find a difference in bilateral and unilateral early breast sucking on lactation within 2 h

after delivery. The results of this study illustrated that the onset time of colostrum and the postpartum filling time of breast in the experimental group were shorter than that in the control group The distribution of the postpartum lactation yield in experimental group at 24 h, 48 h, and 72 h was superior to that in the control group. The prolactin level at 24 h and 48 h after delivery in both groups was substantially increased, and the increase in the experimental group was much higher than that in the control group ($P<0.05$). There was no significant difference in urination frequency and related incidence of complications between the two groups of neonates at 24 h, 48 h, and 72 h ($P>0.05$).

The sample size included in this study was relatively small, and the specific influencing mechanism was not analyzed in depth. Therefore, it is suggested to further expand the sample size in subsequent studies, and analyze the possible mechanism in depth.

In conclusion, the early sucking on both sides of breasts within 2 h after delivery is superior to the unilateral early sucking in promoting the lactation of breast milk. Therefore, we recommend that the midwife guide the primipara to implement bilateral sucking as soon as possible within 2 h after delivery, and promptly help them during the examination to ensure that the neonate sucks effectively. The duration of bilateral sucking should be more than 30 min.

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Disclosure of conflict of interest

None.

Address correspondence to: Xiaoqin Xu, Department of Radiology, Taizhou Municipal Hospital, 381 East Zhongshan Road, Jiaojiang District, Jiaojiang 318000, Zhejiang, China. Tel: +86-13958587572; E-mail: xuxiaoqinn@126.com

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