

Original article

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Factors Related to Success in Relactation

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Purpose: An increase in the breastfeeding rate has been followed by an increase in the number of mothers seeking help in relactation. We investigated the factors related to successful relactation by assessing the impact of medications, supplementer, consultations, and family support.

Methods: A retrospective review of the medical records and telephone survey of mothers who had visited the relactation clinic were conducted from January 2004 to April 2007.

Results: Data from 84 mothers were analyzed to identify the factors associated with success in relactation. Seventy-five percent of the mothers succeeded in obtaining exclusive breastfeeding. Success in relactation was associated with informed referral from medical personnel, the use of galactogogues, and family support.

Conclusion: This study provides new and noteworthy insights concerning relactation. This highlights the need to inform the mothers about the data of relactation, to use galactogogues, and to have their families involved for psychological support and endurance during visits to the relactation clinic.

Key Words: Breastfeeding, Breast milk

Introduction

Exclusive breastfeeding for at least the first six months of life and continuation of breastfeeding with adequate complementary food for up to two years of age or beyond are recommended by the World Health Organization (WHO)¹⁾. Under the influence of various nationwide promotional campaigns, Baby Friendly Hospital Initiative (BFHI) implementation and recent product recalls of infant formula due to isolation of *Enterobacter sakazaki*, eager mothers try to reestablish breastfeeding and seek professional help at the relactation clinics.

It is known that a woman who has stopped breastfeeding can resume the production of breast milk for her own or

adopted infant even without further pregnancy through relactation, a process of rebuilding a mother's milk supply after it has been reduced or dried up²⁾. In animals, it has been recognized that frequent stimulation of the teats result in lactation. Research with goats has confirmed that prolonged application of the milking stimulus can induce both mammary growth and milk secretion³⁾. However, in human, relactation had been considered to be an exotic and abnormal event⁴⁾. Only recently have health professionals became aware of the importance and usefulness of this phenomenon and have begun applying this in various clinical situations⁵⁾. Relactation began as a measure to decrease infant mortality in developing countries^{6, 7)}, but spread to the US by Auerbach and Avery^{2, 8, 9)} to aid mothers

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who had stopped breastfeeding prematurely, who had low birth weight infants, whose babies were hospitalized, and who had adopted babies.

Limited literature on relactation has presented many modalities that may be applied^{2, 9-11)}. Lactation related issues involve cultural implications and the different modalities may need to be adjusted to fit the individual societies. Relactation is a new concept in Korea, and with an increase in the number of mothers seeking help, we aimed to investigate the important factors in promoting success in relactation.

Materials and Methods

Mothers who had visited the lactation clinic with concerns such as lack of breast milk and other breastfeeding issues at Dong Dae Moon Hospital from January 2004 to April 2007 were enrolled. Among the one hundred and thirty five mothers, only 84 could be contacted for telephone survey and these mothers were included for final analysis. Informed consent forms were obtained after explaining the aim of this study. All study participants had given birth to full-term singleton infants and thus 84 infants were included in the study.

One of the investigators, a coauthor of this paper, counseled the mothers about their expectations with relactation and created individualized intervention plans employing the use of the supplementer, galactogogues, and family counseling on the first visit. Breastfeeding issues were assessed by watching the mother-infant dyad breastfeed. Through the breastfeeding assessment, information about frequency and thoroughness of milk removal, appropriate time and duration of the feeding, inappropriate supplementation, mother-infant separation, ineffective latch and inadequate milk transfer were gathered. In cases with nipple confusion and lack of breast milk, a nursing supplementer was used with height adjustment of the device as needed. Galactogogues were prescribed to mothers with lack of breast milk production. Metoclopramide 10 mg every six hours or domperidone 10 mg every six hours were admini-

stered orally and tapered accordingly. Mothers were followed up in the lactation clinic as needed.

Retrospective analyses of the medical records were conducted by two investigators to compare the demographic data of the dyad such as maternal and infant age, birth weight, gestational age, birth place, mode of delivery, family support system, prior feeding method, type and dosage of medicines prescribed, use of supplementer, and the number of visits to the lactation clinic. A telephone survey was conducted by an investigator to follow up on the outcome if not recorded in the medical records, and to ask the mothers about their experiences of relactation. The reasons for attempting relactation and the personal opinion about the treatment modality which was the most helpful were asked. Some mothers stated multiple reasons with equal importance, and all replies were included in the analyses. The family support system was assessed by asking the number of household members and the person whose support mattered most to relactation. For mothers who had quit during the process, the reason for quitting was asked as well.

Success in the transition to exclusive breastfeeding was described as having the baby breastfeed for greater than 90% of the time. Mothers could report their success in the transition to exclusive breastfeeding at anytime during the follow-up period. The study population was divided into relactation success group (n=63) and relactation failure group (n=21) accordingly.

For statistical analyses, SAS (version 8.0) was used. Chi-square test was used for non parametric data and Student's t-test for metric data. Logistic regression was used to assess the odds ratio promoting success and a *P* value of less than 0.05 was considered to be significant.

Results

Out of the 135 mothers, data from 84 mothers were included for analysis. Sixty-three mothers (75%) succeeded in transition to exclusive breastfeeding with relactation. The

mean age of the infants at their first visit to the clinic were 65.1 ± 50.9 days in the relactation success group and 70.9 ± 50.7 days in the relactation failure group. No significant differences were demonstrated in the characteristics of the infants when comparing the demographic data such as age at visit to the clinic, birth weight, sex, and mode of delivery (Table 1).

Most infants were on mixed feeding prior to their visit to the clinic (Table 1). Twenty-four infants out of the 63 infants (38%) in the relactation success group had been fed with expressed breast milk and 3 infants out of 21 infants (14%) in the relactation failure group had expressed breast milk. The mean age and educational status of mothers were similar. Nineteen mothers in the relactation success group and seven mothers in the relactation failure group were multi-gravidas, and 30.1% and 33.1%, respectively, had breastfed their first child partially. This difference was not a significant factor in the success of relactation. The percent of working mothers was slightly higher in the relactation success group, but not

to a statistically significant degree. Family structure was not different between the two groups. The enrollment to commercial postpartum care facilities during the postpartum period was not different between the two groups.

The reason for visiting the relactation clinic could be summarized into five big categories (Table 2) and the most common reason was to increase the amount of breast milk during the period of mixed feeding in both groups. The second reason for relactation was to switch from formula to breast milk after premature supplementation of formula during the first week. Only one case in each group was from infant's intolerance to formula. Other reasons involved maternal medical problems.

Information on relactation was provided through consultation by medical personnel in the majority of cases and was significantly associated with success in relactation (Table 3). Other sources were friends, mass media, and the Internet which were similarly distributed between the two

Table 1. Characteristics of the Study Participants

	Relactation		P-value
	Success (n=63) no. (%)	Failure (n=21) no. (%)	
Infant			
Mean age at first visit (day) (range)	65.1±50.9 (10-203)	70.9±50.7 (5-237)	0.18
Birth weight (g)	3,132.5±493	3,051.9±614	0.25
Sex (M/F)	31/32	7/14	0.20
Method of birth			0.11
NSVD	44 (71.9)	15 (64.4)	
Previous feeding method			0.66
Formula milk	6 (9.5)	2 (9.5)	
Breast milk	24 (38.1)	3 (14.3)	
Mixed feedings	33 (52.4)	16 (76.2)	
Mean age of mothers (yr)	30.7±3.3	31.7±4.4	0.17
Maternal education			0.24
High school graduates	16 (25.8)	7 (33.3)	
University graduates or higher	47 (74.6)	14 (66.7)	
Maternal employment	16 (25.4)	3 (13.6)	0.19
Stay at commercial postpartum care facilities	20 (31.7)	6 (28.6)	0.49
Family structure			0.49
Nuclear family	51 (80.9)	9 (42.9)	
Living with grandparents	12 (28.1)	12 (57.1)	

Abbreviation: NSVD, normal spontaneous vaginal delivery.

Table 2. Reasons for Seeking to Relactate

	Relactation	
	Success (n=63) no. (%)	Failure (n=21) no. (%)
To increase the amount of breast milk during mixed feeding	41 (65.1)	14 (66.6)
To switch over to breastfeeding while formula feeding to benefit from breast milk	7 (11.1)	5 (23.8)
To resume breastfeeding after hospital discharge of infant	10 (15.9)	1 (4.8)
Intolerance to cow's milk	1 (1.6)	1 (4.8)
To breastfeed after treatment of maternal medical problem	4 (6.3)	0 (0.0)

Table 3. Source of Information about Relactation

	Relactation	
	Success (n=63) no. (%)	Failure (n=21) no. (%)
Medical personnel	27 (44.3)*	8 (36.4)
Friends	12 (19.7)	3 (13.6)
Mass media	3 (4.7)	6 (28.6)
Internet searching	21 (34.4)	4 (18.2)

*P value<0.05 vs. relactation failure.

groups.

The mean frequency of visit to the relactation clinic was 3.7 ±3.1 (range: 1-15) in the relactation success group and 2.5± 2.7 in the relactation failure group (range: 1-9). Percent of supplementer use was 60.3% in the relactation success group and 57.1% in the relactation failure group. The trial period of the supplementer was 4-40 days in both groups. This was not a significant factor in success in relactation.

Medications were prescribed as galactogogues to those who had low production of breast milk and the dosage and choice between domperidone and metoclopramide were adjusted as needed. In the success group, 38 mothers took domperidone and 23 mothers took metoclopramide followed by domperidone. Seven mothers took domperidone and eleven mothers took metoclopramide in the failure group. The duration of administration for the galactogogues was 3-21 days for both groups including the period for reducing the dosage. No statistical significance was found between the medication and success in relactation.

Relactation counseling was the most basic intervention which was provided to all mothers, to address the concerns and anxiety of the mothers and to solve problems in breastfeeding. The use of galactogogues was perceived to be more helpful in the success group. The odds ratio for family support from their maternal grandmother and their husband were 6.44 and 4.67, respectively (Table 4). This was also statistically significant between the two groups.

Mothers who had failed relactation reported that the reason for quitting was as follows: frustration about inadequate milk supply (43%), physical fatigue from

breastfeeding (14.3%), poor weight gain of the baby (14.3%), sore nipple (14.3%), strong refusal of the baby (4.8%), getting pregnant (4.8%), and opposition of family members (4.8%).

Discussion

This study is the first to reflect the experience of relactation from the mother's point of view and identifies the important factors for successful relactation. In order to succeed in relactation, our results demonstrate that use of galactogogues and family support is helpful. Referral by medical personnel was also an important promoter of success in relactation. Pediatricians or obstetricians had referred mothers who had complained of difficulties during the period of breastfeeding, and those mothers had realistic expectations and were more motivated.

Previous reports have reported that baby younger than three months and those who had previously been breastfed tended to be more willing to do and successful in relactation⁶⁾. This was not a relevant factor in our study since the mean age of the participants in this study were less than three months of age. A similar percent of the infants in both groups had been exposed to breast milk prior to clinic visits, making prior feeding method unremarkable.

Marieskind¹²⁾ commented that there are two paramount requirements for relactation, a strong desire by the mother to feed the infant and stimulation of the nipple. Brown^{5, 11)} and Jelliffe and Jelliffe¹³⁾ added a third requirement, a support system to build and maintain the mother's confidence. Similar number of mothers had fed some expressed breast milk and pumping may have not provided enough stimulation of the nipple for adequate supply. More mothers in the success group were staying with their parents in terms of family structure but this per se was not an important promoter in success. Breastfeeding was not popular when the current grandmothers were mothers in the 1960-1980's in Korea. Thus, contrary to common beliefs, grandmothers in Korea are sometimes a big obstacle in exclusive breastfeeding in Korea. Formula companies have showered

Table 4. Treatment Modality Felt to be Most Helpful in Relactation

	Relactation		
	Success (n=63)	Failure (n=21)	Odds ratio (95% CI)
Use of supplementer	16	5	1.92 (0.46-7.99)
Use of galactogogues	33*	6	4.81 (1.27-18.31)
Family support from husband	28*	8	4.67 (1.25-17.44)
Family support from mother	29*	3	6.44 (1.64-25.30)

*P value<0.05 vs. relactation failure.

the mass media with fancy advertisements and have made breastfeeding seem inferior, less scientific, and old-fashioned than formula feeding.

Maternal age or maternal educational level was not different between the two groups. Previous reports showed higher rates of breastfeeding in employed and well-educated women¹⁴⁻¹⁶.

Discussing the reasons for relactation at the first visit helps the mother clarify her feelings, evaluate her motivations, and assess whether or not her goals are likely to be met. If the mother has weaned the baby because of a sore nipple or an incorrect latch, lactation counseling alone may aid in transition of exclusive breastfeeding. Intensive counseling addressing history taking of the mother-baby dyad was also helpful in establishing the rapport with the mothers and helped relax and encourage the mother. Some babies had switched to the breast easily but others needed a lot of support especially if they had nipple confusion. One investigator in our group has developed a nipple confusion reversal program by stimulating the baby orally with various texture and shapes which helps the infant overcome their "confusion."

Family counseling was important in establishing a supportive environment for the mother. Lack of breast milk production may be felt as a sign of failure as a mother in sensitive and over-anxious mothers, so it is crucial to encourage and support the mothers emotionally and physically by helping with household chores. Grandmothers generally take care of the mothers and newborns in the immediate postpartum period in Korea and those who are unable to do so may hire postpartum helpers or enroll themselves to commercial postpartum care facilities. Similar number of mothers had stayed at postpartum centers but no difference in the success rate was found. Most postpartum care facilities hire lactation specialists to aid with breastfeeding but data on the faculty and staff of the postpartum care facilities was not assessed in this study because comparison of professional quality in each center would be out of the scope of this paper.

Support from the husband and maternal grandmother

was associated with a high odds ratio in success group and a significant difference was found between the two groups. This finding highlights the importance of employing the innate family support system. Peer support by meeting with other mothers who are relactating also provides emotional support and encouragement.

A nursing supplementer known as "Lact-aid" in the US may help overcome nipple confusion and stimulate the mother's prolactin release. If the mother's milk supply was low, the nursing supplementer offers the baby instant reward at the breast. The height of the reservoir and the frequency of use of the supplementer were regulated to prevent the infant from becoming overly dependent on the supplementer.

A low milk supply is one of the most common reasons given for discontinuing breastfeeding; both mothers and physicians have sought medicines to address this concern. We were compliant with the Academy of Breastfeeding Medicine relactation protocol and evaluated the augmentation of the frequency and thoroughness of milk removal by assessing and correcting the timing and duration of feedings, inappropriate supplementation, mother-infant separation, ineffective latch and inadequate milk transfer¹⁷. Galactogogues are medications or substances that assist initiation, maintenance or augmentation of breast milk production. Both metoclopramide and domperidone act as antagonists of dopamine receptors, resulting in an increase of prolactin^{17, 18}. Especially, metoclopramide promotes lactation by antagonizing the release of dopamine in the central nervous system¹⁸ and has been measured in breast milk in higher concentrations than maternal serum levels but is well below the therapeutic levels used in infants¹⁹. It has been reported that the use of galactogogues does not alter the composition of breast milk²⁰. It was prescribed for 4-21 days including the period for reducing the dosage in our study which agrees with previous reports¹⁹. Domperidone is less likely to cross the maternal blood brain barrier resulting in less extrapyramidal side effects than metoclopramide and is less likely to cross into the breast milk²¹. Domperidone was reported to be safe and effective in increasing breast

milk production in a randomized controlled trial²²). Despite the use in most of the developed countries, the US FDA issued a warning against its use in the US based on safety concerns with IV use and risks associated with drug importation. Antipsychotic medication such as sulpiride and chlorpromazine also block the dopamine receptors and the prolactin inhibiting action of dopamine but concerns on extrapyramidal side effects have been addressed¹⁵) and were not prescribed. Women have used certain herbs or foods to enhance their milk supply and most have not been scientifically evaluated²³). The mechanisms of action are unknown for the commonly mentioned herbs such as fenugreek, goat's rue, milk thistle, anise, basil, blessed thistle, fennel seeds, marshmallow and others¹⁷). A commercial Fenugreek tea is available in Korea but we did not assess the consumption since the efficacy is not yet proven by a randomized controlled trial.

This study has a few limitations as mothers enrolled were from the city of Seoul and only those visiting our hospital were surveyed. A small number of mothers may not represent the general population but we believe that a study of this kind has value in its uniqueness. On the other hand, mothers who came to the relactation clinic may be considered to be more enthusiastic about breastfeeding and may not reflect the trends of the general population.

Relactation is time-consuming and requires a lot of effort from the mother and physician, but all participating mothers felt satisfied with the relactation experience regardless of the success in breast milk production and viewed the efforts as positive. Frustration over lack of inadequate milk supply, physical fatigue from breastfeeding, poor weight gain of the baby, sore nipple, and strong refusal of the baby were the reasons given for giving up in the failure group and most are concerned with misunderstandings and lack of emotional support. Despite the good outcome of relactation, it is more important to prevent lactation failure initially by establishing proper breastfeeding during the first days of life. When mothers receive optimal support from the health care system at the time of birth, and begins breastfeeding within the first hour, relactation is not needed. The importance of

implementing the Ten steps to Successful Breastfeeding of the BFHI and critical evaluation and feedback with positive encouragement to the mothers at the first well baby checkups within the first week of life is essential for success in breastfeeding. Relactation consultations may also be made at the time if needed. Preventive administration of galactogogues to mothers whose infants are separated in the hospital, such as premature babies, may help establish the breast milk supply²⁴) and improve their outcome²⁵⁻²⁷). Nevertheless, Intensive counseling and evaluation of effective breastfeeding should always precede the use of galactogogues. This study provides new and noteworthy guidelines concerning relactation counseling in Korea. This study highlights the role of medical personnel to inform the mothers about relactation and refer them to lactation clinics. Use of galactogogues and family support from the father or grandmother during relactation counseling was important to succeed in relactation.

한글요약

목적: 모유수유율이 증가하면서 재수유에 관한 수요가 증가하고 있다. 이에 성공적인 재수유에 기여하는 인자를 조사하기 위해서 약물, 모유수유 보충기, 상담, 가족의 지지 등의 기여도를 조사하였다.

방법: 후향적인 의무기록 조사와 2004년 1월부터 2007년 4월 까지 본원 재수유 클리닉을 방문한 아기 엄마들에게 전화설문을 실시하였다.

결과: 총 84명의 자료를 분석하여 재수유의 성공에 도움이 되는 인자를 조사하였다. 75%에서 완전 모유수유로 성공적으로 이행할 수 있었다. 재수유 클리닉을 다니면서 재수유에 성공한 경우 의료진에 의해서 재수유 클리닉으로 의뢰된 경우, 약물을 사용한 경우와 가족의 지지가 있는 경우가 통계적으로 유의하게 높았다.

결론: 재수유에 성공하기 위해서는 산모들에게 재수유에 관한 정보를 미리 제공하고, 필요 시 유즙분비를 촉진하는 약물을 처방하고 상담 기간 동안 가족과 함께 상담을 받게 해서 정신적인 지지를 제공하는 것이 중요하다.

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