

Pain and breastfeeding: a prospective observational study

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Summary

Objective: To demonstrate that pain affects the goodness of breastfeeding. **Materials and Methods:** Seventy-nine patients were interviewed regarding satisfaction in breastfeeding, tiredness, uterine pain, nipple and other pain, and analgesic use at day three and at first, second, third, and fourth week after birth. Data regarding the mode of delivery were recorded from medical charts. Milk formula supplements, bottle use, pacifier use, and nipple shields use were considered as variables suggesting unsuccessful breastfeeding. **Results:** At third day after delivery, it appeared that analgesic use was significantly associated with milk formula supplementing, bottle use, less satisfaction in breastfeeding, and more tiredness. At first week after delivery, the presence of pain differing from nipple and uterine pain, was more likely associated with milk formula supplementing, bottle use, pacifier use, less satisfaction in breastfeeding, and more tiredness. At third week after delivery, nipple pain was directly related to tiredness, while it increased the odds of adding milk formula and using a bottle. **Conclusion:** Pain affects the goodness of breastfeeding.

Key words: Pain; Breastfeeding; Delivery; Cesarean section; Analgesic drugs.

Introduction

The irrefutable advantages of breastfeeding for babies, mothers, society, as well as for the environment, have been pointed out so far by many organizations and researchers. Many strategies to prevent breastfeeding discontinuation have been developed by midwives and caregivers to attain the goal of exclusive maternal breastfeeding for at least the first six months, as advocated by World Health Organization (WHO) / United Nation Children's Fund (UNICEF). Clinician support and prevention / treatment of depressive symptoms should be useful for avoiding breastfeeding discontinuation [1], while proper baby positioning may be helpful in preventing sore nipples [2], and nipple-related pain, that could lead to breastfeeding discontinuation [3].

The authors believe that pain during breastfeeding may lead to its discontinuation, independently from other factors. It has been noted that pain reported in some kind of conditions after delivery may affect breastfeeding [4-9]. Those reports, however, were not aimed to determine how much pain levels may negatively affect breastfeeding. Additionally, a few studies aimed to assess that pain control after delivery was useful for breastfeeding [10, 11]. In the authors' opinion, the topic should be better investigated and in more detail, because they feel that pain independently affects both milk production and milk secretion (lactogenesis phase II), as well as baby breast positioning and attaching.

For example, it has been reported that cesarean sections (CS) may affect successful breastfeeding [9, 12]. This is due to some difficulties in providing early breastfeeding support related to CS (bonding, early breast attachment, and rooming in). However, a lower milk production was present in patients who underwent CS and those reporting higher levels of pain during breast pumping [5].

Therefore the authors assessed if self-reported pain and analgesic drugs use during the first month after delivery may have influenced the goodness of breastfeeding.

Materials and Methods

A prospective observational study of 79 healthy women supported for breastfeeding after birth was carried out. The patients agreed to participate in the study and were randomly enrolled in the "Fatebenefratelli Villa San Pietro" Hospital in Rome (Italy). Patients were interviewed at day three and contacted by phone at the first, second, third, and fourth week after birth. Data about patient characteristics, mode of delivery, tears after birth, and drug use were collected from medical charts. At the third day, first, second, third, and fourth week after delivery, patients were asked to quantify level of satisfaction in breastfeeding (from 0 to 10), level of tiredness during breastfeeding (from 0 to 10), level of nipple pain (from 0 to 10), level of uterine pain (from 0 to 10), presence of pain elsewhere (yes/no), as well as use of analgesic drugs (yes/no), milk formula supplements (yes/no), bottle-feeding (yes/no), nipple shields (yes/no) and pacifiers (yes/no).

Effective breastfeeding was not achieved if milk formula supplements were given or if bottles or pacifiers were used. Moreover, using nipple shields may be a sign of incorrect attachment of the baby to the breasts. Such variables were chosen to assess the goodness of breastfeeding.

Therefore, it was assessed if milk formula supplements, bottle-feeding, nipple shields, and pacifier use were related with uterine and nipple pain scores, with presence of other kinds of pain, and with analgesic drugs used at the third day and at first, second, third, and fourth week after birth (multivariate logistic regression analyses). Additionally, it was assessed if self-reported scores of satisfaction in breastfeeding and tiredness at day three and first, second, third, and fourth week after birth were correlated to uterine and nipple pain scores, presence of other kinds of pain, and analgesic drug use (multivariate linear regression analyses). SPSS 16.0 was used for statistical analyses. A p value ≤ 0.05 was chosen as significant.

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Table 1. — Descriptive statistics including rates of milk formula supplements, bottle, pacifier, and nipple shield use, with mean values (\pm standard deviations) according to mode of delivery.

	Third day					
	Milk formula supplements	Bottle	Pacifiers	Nipple shields	Satisfaction in breastfeeding	Tiredness
Spontaneous delivery (n 45 - 57%)	7 (15.6%)	7 (15.6%)	5 (11.1%)	12 (26.7%)	9 \pm 1.35	4.8 \pm 1.70
Cesarean section (n 33 - 41.8%)	18 (54.5%)	18 (54.5%)	4 (12.1%)	16 (48.5%)	8.8 \pm 1.29	4.7 \pm 1.68
Vacuum (n 1 - 1.3%)	No	No	No	No	10	5
	First week					
	Milk formula supplements	Bottle	Pacifiers	Nipple shields	Satisfaction in breastfeeding	Tiredness
Spontaneous delivery (n 45 - 57%)	7 (15.6%)	6 (13.3%)	5 (11.1%)	8 (17.8%)	9.2 \pm 1.24	5 \pm 2.01
Cesarean section (n 33 - 41.8%)	15 (45.4%)	15 (45.4%)	12 (36.4%)	6 (18.2%)	8.9 \pm 1.36	5.6 \pm 2.01
Vacuum (n 1 - 1.3%)	No	No	Yes	No	10	7
	Second week					
	Milk formula supplements	Bottle	Pacifiers	Nipple shields	Satisfaction in breastfeeding	Tiredness
Spontaneous delivery (n 45 - 57%)	6 (13.3%)	11 (24.4%)	11 (24.4%)	2 (4.4%)	9.2 \pm 1.31	3.8 \pm 2.13
Cesarean section (n 33 - 41.8%)	16 (48.5%)	17 (51.5%)	16 (48.5%)	2 (6%)	9.2 \pm 1.23	5.2 \pm 1.73
Vacuum (n 1 - 1.3%)	No	No	Yes	No	10	7
	Third week					
	Milk formula supplements	Bottle	Pacifiers	Nipple shields	Satisfaction in breastfeeding	Tiredness
Spontaneous delivery (n 45 - 57%)	7 (15.6%)	7 (15.6%)	11 (24.4%)	2 (4.4%)	9.2 \pm 1.30	2.8 \pm 2.09
Cesarean section (n 33 - 41.8%)	17 (51.5%)	17 (51.5%)	17 (51.5%)	1 (3%)	8.6 \pm 1.44	4.4 \pm 1.62
Vacuum (n 1 - 1.3%)	No	No	Yes	No	10	6
	Fourth week					
	Milk formula supplements	Bottle	Pacifiers	Nipple shields	Satisfaction in breastfeeding	Tiredness
Spontaneous delivery (n 45 - 57%)	7 (15.6%)	7 (15.6%)	11 (24.4%)	2 (4.4%)	9.1 \pm 1.78	2.1 \pm 1.74
Cesarean section (n 33 - 41.8%)	17 (51.5%)	17 (51.5%)	18 (54.5%)	1 (3%)	8.6 \pm 1.44	3.6 \pm 1.33
Vacuum (n 1 - 1.3%)	No	No	Yes	No	10	5

Results

Overall, 46 (57%) patients delivered spontaneously. CSs were 33 (41.8%). Just one patient underwent vacuum extractor-aided delivery. The mean age was 29.7 (\pm 3.48). Table 1 illustrates rates of patients using milk formula supplements, bottle feeding, pacifiers, nipple shields, and mean score given for satisfaction in breastfeeding and tiredness. Table 2 shows pain scores and analgesic use rates in cesareans and spontaneous deliveries. Pain was usually reported in CS incision (24 cases at third day and 18 at first week), in vaginal-perineal tear sutures, in episiorrhaphies (eight cases at third day) and in hemorrhoids (two cases at third day). More rarely, musculoskeletal back pain (two cases at third day) was reported, and one patient reported kidney pain at third day.

At third day after delivery it seemed that analgesic use was significantly associated with milk formula supplementing (odds ratio 3.438, CI 95% 1.226 – 9.664, $p = 0.019$), bottle using (odds ratio 3.438; 1.226 – 9.664; $p = 0.019$), less satisfaction in breastfeeding (standardized coefficient -0.245, CI 95% -1.280 – -0.068; $p = 0.030$) and more tiredness (standardized coefficient 0.274; CI 95% 0.255 – 1.983; $p = 0.012$).

At first week after delivery, the presence of pain differ-

ent from nipple and uterine pain was more likely associated with milk formula supplementing (odds ratio 5.195; CI 95% 1.555 – 17.355; $p = 0.007$), bottle using (odds ratio 5.829; CI 95% 1.721 – 19.743; $p = 0.005$), pacifier using (odds ratio 3.681; CI 95% 1.053 – 12.866; $p = 0.041$), less satisfaction in breastfeeding (standardized coefficient -0.309; CI 95% -1.683 – -0.299; $p = 0.006$) and more tiredness (standardized coefficient 0.280; CI 95% 0.295 – 0.370; $p = 0.013$).

At third week after delivery, nipple pain was directly related with tiredness (standardized coefficient 0.256; CI 95% 0.042 – 0.450; $p = 0.019$) while it increased the odds of adding milk formula and using a bottle (odds ratio 1.760; CI 95% 1.097 – 2.822; $p = 0.019$).

It should be noted that multivariable models did not reach significance, suggesting overfit for some variables.

Discussion

Effective breastfeeding (i.e. exclusive breastfeeding for at least six months) is linked to several aspects that are impossible to objectify and standardize in clinical studies. Hurst [13] indicated that lactogenesis phase II may be affected by internal and external environments.

Table 2. — Descriptive statistics including pain scores and analgesic use rates in relation to mode of delivery.

	Third day			Analgesic use
	Nipple pain	Uterine pain	Overall pain	
Spontaneous delivery (n 45 - 57%)	3.3 ± 2.12	3.1 ± 2.24	0.2 ± 0.40	3 (6.7%)
Cesarean section (n 33 - 41.8%)	4.2 ± 1.68	3.7 ± 1.87	0.8 ± 0.41	21 (63.6%)
Vacuum (n 1 - 1.3%)	2	3	1	Yes
	First week			Analgesic use
	Nipple pain	Uterine pain	Overall pain	
Spontaneous delivery (n 45 - 57%)	2.3 ± 1.77	1.9 ± 1.75	0	0
Cesarean section (n 33 - 41.8%)	2.4 ± 1.40	2.5 ± 1.60	0.5 ± 0.51	3 (9.1%)
Vacuum (n 1 - 1.3%)	2	0	0	No
	Second week			Analgesic use
	Nipple pain	Uterine pain	Overall pain	
Spontaneous delivery (n 45 - 57%)	1.3 ± 1.42	0.9 ± 1.44	0	0
Cesarean section (n 33 - 41.8%)	1.3 ± 1.24	1.7 ± 1.46	0	0
Vacuum (n 1 - 1.3%)	0	0	0	No
	Third week			Analgesic use
	Nipple pain	Uterine pain	Overall pain	
Spontaneous delivery (n 45 - 57%)	0.4 ± 0.94	0.4 ± 0.91	0	0
Cesarean section (n 33 - 41.8%)	0.9 ± 1.05	1.1 ± 1.14	0	0
Vacuum (n 1 - 1.3%)	0	0	0	No
	Fourth week			Analgesic use
	Nipple pain	Uterine pain	Overall pain	
Spontaneous delivery (n 45 - 57%)	0.2 ± 0.71	0.1 ± 0.53	0	0
Cesarean section (n 33 - 41.8%)	0.6 ± 0.97	0.6 ± 0.99	0	0
Vacuum (n 1 - 1.3%)	0	0	0	No

The former is related to a complex hormonal milieu, emotional status, and anatomical characteristics of the breasts and nipples, while the latter is related to behavior. It is easy to suggest that breastfeeding support affects the external environment. However, factors affecting the internal environment, such as pain and stress, may compromise even breastfeeding support. Evidence that stress hormones may affect milk production and secretion involving prolactin and oxytocin behavior has been reported in the literature [14, 15].

It has been reported that patients who underwent CS [9, 12], patients with complicated vaginal deliveries [15], or ones reporting nipple pain [6], may experience ineffective breastfeeding. In the present sample, it seemed that patients who underwent CS were more likely to add milk formula, use bottle, and pacifiers. It would appear that clinical conditions may have affected the goodness of breastfeeding due to ineffectiveness in bonding, baby breast-attaching or breastfeeding support. However, it has

been indirectly reported that many kinds of pain may affect breastfeeding overall [4, 5, 7, 8]. In the present sample, mean pain scores and analgesic use rated higher in CS patients. Therefore, the authors feel that ineffective breastfeeding after CS is linked with pain. Pain may negatively affect the endocrine system in relationship with the central nervous system [16-18]. In light of this hypothesis, the goodness of breastfeeding should be linked to mechanisms involving pain control; the present data support this hypothesis. The best predictor of ineffective breastfeeding seemed to be the need for analgesic drugs at third day and the presence of any pain at first week.

Pain may directly affect mood; such an aspect explains both the negative correlation between pain during breastfeeding and satisfaction score given during breastfeeding, and the positive correlation between pain and tiredness during breastfeeding.

It should be pointed out that uterine and nipple pain levels were low overall, and did not relate to the goodness of breastfeeding in this study (with the exception of nipple pain at third week). Breton *et al.* [19] reported that oxytocin had an antinociceptive role in lamina I-II neurons, enhancing the antinociceptive effect of GABAergic neurons. Interestingly, in patients who underwent CS, Moore *et al.* [11] revealed better pain control and satisfaction with no differences in breastfeeding effectiveness by administering preoperative gabapentin 600 mg. Other authors [10] reported that pain control after cesareans facilitated breastfeeding. Therefore, one could speculate that the physiologic oxytocin production during breastfeeding could be useful for controlling nipple and uterine discomfort. This may prove useful even in controlling some mood disorders during breastfeeding.

This study had some limitations; it should be pointed out that many variables which may be involved in breastfeeding were not assessed. Therefore, one should construct a study in which these variables are assessed in a multivariable model. Such kind of study requires much more than seventy-nine patients to reach statistical significance. Therefore, the data presented should be considered interesting for further research. Moreover, the authors feel that a prospective observational study is not able to explain physiopathologic mechanisms underlying milk production in patients with pain. Pain levels after delivery should be investigated in association with stress hormone increases and central pain control pathways. This will provide evidence for further analgesic interventions.

In conclusion, this study highlights that pain affects the goodness of breastfeeding irrespective from mode of delivery. It is important to stress that every kind of pain should be treated in order to favor the success of breastfeeding.

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