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The adaptive psychological changes of elective induction of labor in breastfeeding women

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ABSTRACT

Background: Labor induction has been associated with breastfeeding suppression, but reasons for why this association exists have not been well determined.
Methods: We examined the influence of elective labor induction by vaginal prostaglandin at gestational week 41^{+3} days on affective, cognitive, and behavioural adaptations early in puerperium and on breastfeeding pattern at 1 and 3 months.
Results: One hundred and eighty consecutive puerperae were assigned to two groups: mothers having received vaginal prostaglandin E2 gel (Prepidil®, dinoprostone) before labor (PGE group, $n = 90$) and mothers having received no treatment (unmedicated group, $n = 90$). The day of discharge mothers completed the Edinburg Postnatal Depression Scale, (EPDS), State and Trait Anxiety Inventory (STAI-Y), and Mother to-Infant Bonding Scale (MIBS). Later they participated in telephone interviews concerning their breastfeeding practices at 1 and 3 months, which were classified according to WHO definitions. When compared with unmedicated, PGE group puerperae scored [median, (IQR)] significantly higher EPDS [9 (7–13) vs 5 (3–8), p 0.003], STAI-state [46 (39–51) vs 39 (34–48), p 0.002], STAI-trait [39 (36–48) vs 34 (32–45), p 0.04], and MIBS [10 (5.25–10) vs 5 (3–4), p 0.002] scores. In addition, while the breastfeeding practices were similar at hospital discharge, at follow-up the labor induced mothers were less likely to maintain full breastfeeding with respect to untreated mothers: 1 month (p 0.001); and 3 months (p 0.003).
Conclusion: We present evidence that elective induction of labor by prostaglandins at gestational week 41^{+3} days is associated with reduced exclusive breastfeeding rates at 1 and 3 months after discharge and higher EPDS, STAI, and MIBS scores.

1. Introduction

Women undergo adaptive physiological and psychological changes during pregnancy, labor, delivery, and lactation [1]. One frequently reported expression of these adaptations is that the breastfeeding pattern of labor induced women is adversely affected [2,3]. However, research on this subject is scarce and in most cases, no distinction is made between elective induction at term (37–40 weeks of gestation) in women with no medical reasons and different expectant management [at 41 completed weeks (41^{+0}) or beyond] or induction for medical indications. For that reason, the observed effects may be caused by the medical complications that led to the induction [4]. Differences in this adaptation may be partly explained by differences in personal characteristics between both women choosing or rejecting pharmacological labor induction without medical indication or by pharmacological agents used during labor, in particular prostaglandins or oxytocin to induce or augment uterine contractions and labor-analgesia, historically two of the key factors which effect breastfeeding success [5]. Induction of labor before 42 completed weeks of gestation has increased steadily in high-income countries and in many low-income and middle-income countries [6,7]. This increase reflects rises in rates of induction with and without medical indication, also known as elective induction of labor. Data supporting induction of labor for women at 41 weeks of gestation beyond exist [6,8], but less is known about the impact of drugs used for induction on maternal adaptive psychological changes associated with labor induction. Supporters of elective induction argue that it is an effective and safe procedure undertaken in a woman who is psychologically more prepared for labor and well rested [7]. In a study carried out by Nuutila et al., women who were induced who had positive attitudes toward induction prenatally, expressed less fear of pain with induced labor, and after delivery 90% had positive attitudes toward their induction experience [9]. Others say that personal characteristics (i.e., employed outside the home, the ones who are the primary care givers

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for children, and manage the household) have a major influence on choice of elective labor induction and at the same time have the potential to have negative psychological effects on women's experiences of labor and early mother-infant interaction [9]. One expression of these adaptations is that the breastfeeding is adversely influenced [1]. More recently it was suggested that drugs used for the induction or augmentation of labor can interfere with the mechanisms for prolactin and oxytocin release in the early postpartum period, influencing the maternal interaction with the infant and breastfeeding-related changes in personality profile, but again evidence supporting this claim is lacking [2,3,5].

We planned this study with two aims: (1) to compare the maternal psychoemotional changes following elective induction of labor by prostaglandin at gestational week 41^{+3} days with similar women who have chosen spontaneous labor at term (37–40 weeks of gestation) and (2) to examine whether the breastfeeding practices differ from discharge until the 3rd postnatal month between mothers who have been exposed to different labor ward pharmacological routines.

2. Methods

We proposed this study to all women presenting at term of gestation at the two, tertiary level, educational maternity hospitals of Padua (Italy), which combined perform approximately 4000 births per year. The hospitals where the study took place are located in an industrialized area supporting advanced educational levels, good socio-economic status, late maternal age at first birth, and high rates of nulliparity.

We used the following criteria: the mothers had to be Italian-speaking, with an uncomplicated singleton pregnancy at term and a normal vaginal delivery after elective labor induction by vaginal prostaglandin E2 gel (Prepidil®, dinoprostone) at week 41/3 days, according to standard maternity routines of both maternity services. The mother and her infant should not have been separated after birth, not even for medical exams and the infants were breastfed since the delivery room.

The recruitment consecutive period was between January 2014 and October 2014, from Monday to Friday. The numbers of mothers recruited were 204, 24 of which failed to deliver vaginally (20 with elective labor induction and 4 without). Of the remaining 180, 90 were mothers with elective labor induction with vaginal administration of prostaglandin and 90 with spontaneous vaginal delivery at term (37–40 weeks of gestation) without significant medical intervention.

Women who consented to be part of the study allowed prospectively access to their obstetric records. The women in the prostaglandin vaginal group received dinoprostone gel (Prepidil®), at recommended doses, until a favourable Bishop score was achieved (at least six) for a maximum dose of 2 mg (four cervical gel applications) [10].

According to standard maternity routines in both maternity services, all healthy newborns are placed skin-to-skin with their mothers immediately after birth. The newborn remains on the mother's chest until the first breastfeeding is established or until the newborn falls asleep. Usually the partner of the woman is present during and after childbirth. Rooming-in is practiced at the maternity ward. Maternity rooms are created to facilitate an “at-home-feeling” and to allow parents to interact with their newborn. Skin-to-skin contact with the newborns and frequent breastfeeding are encouraged. In the absence of peripartal complications, maternity length of stay was scheduled at 48 h after a vaginal delivery and at 72 h after a caesarean section.

The morning of discharge, the women were asked to complete the Edinburgh Postnatal Depression Scale (EPDS) [11], the State-Trait Anxiety Inventory (STAI-Y) [12], and the Mother-to-Infant Bonding Scale (MIBS) [13].

The EPDS is a self-report questionnaire composed of 10 items scored in a four-point Likert scale (0–3) designed to assess pregnancy and postpartum depression. The best cutoff point for screening depression was ≥8 and between 9 and 10 in Italian population, respectively [14].

The STAI-Y is composed of two 20-item self-report scales applied to measure the anxiety conditions, given a 4-point frequency scale, that varies between the temporary condition of “state anxiety” (STAI-S, anxiety in a specific situation) and the more general and long-standing quality of “trait anxiety” (STAI-T, anxiety as a general trait). A score equal to or higher than 45 indicates high-anxiety states [12].

The MIBS consists of 8 adjectives (loving, resentful, neutral or felt nothing, joyful, dislike, protective, disappointed and aggressive), each followed by a four-point Likert scale ranging from “Very much” (0) to “Not at all” (3). When the adjective reflects a negative emotional response, the scoring is reversed. Thus, possible scores on the MIBS range between 0 and 24, with high scores (≥2 cut-off) indicating a problematic mother-to-infant bonding [13].

Infant feeding data were recorded in accordance with the definitions of the World Health Organization (exclusive breastfeeding is defined as only maternal milk and nothing else; complementary breastfeeding is defined as a combination of breast milk and formula; and formula feeding is defined as offering exclusively bottle-fed formula) [15].

Breastfeeding patterns after discharge from the hospital were collected from the mothers by a trained professional during the follow-up telephone interviews that were held 1 and 3 months later. At each interview, the mothers were asked to indicate with a yes/no response if they were breastfeeding in the last 24 h. This and all other pertinent information were collected and used in the following analyses.

The study was approved by the Ethics Committee of Padua University.

2.1. Statistics

Data were analyzed using the SPSS program (SPSS Inc. Chicago) version 14.0. Continuous data were expressed as median and interquartile range (IQR). Dichotomous variables were compared using the Fisher test. The Kruskal–Wallis test was performed for testing differences between groups. A p-value of <0.05 was considered significant.

3. Results

Except for gestational age, anthropometrical and clinical characteristics of PGE labor induced and untreated mothers and neonates were similar. Also, their socioeconomic features were characterized by mean age >30 years, nulliparity in more than in half, advanced educational levels, and good socio-economic status (Table 1).

The median and interquartile range (IQR) of the EPDS, the STAI-Y, and the MIBS are displayed in Table 2.

Prostaglandin induced mothers showed higher (median, interquartile range, IQR) scores on the EPDS [9 (7–13) vs 5 (3–8), p 0.003] and on the STAI-state [46 (39–51) vs 39 (34–48), p 0.002], and STAI-trait [39 (36–48) vs 34 (32–45), p 0.04]. They also presented higher scores on the MIBS [10 (5.25–10) vs 5 (3–4), p 0.002] with the related subscales: Dislike (p 0.03) and Disappointed (p 0.01), respectively. In addition, while the breastfeeding practices were similar at maternity discharge in both groups of mothers (breastfeeding: exclusive 88 vs 89%; complementary 11 vs 12%, respectively; p 0.99), at follow-up the labor induced mothers were less likely to maintain full breastfeeding with respect to untreated mothers: 1 month (breastfeeding: exclusive 54 vs 85%; complementary 36 vs 14%; formula 10 vs 1%; p 0.001); and 3 months (breastfeeding: exclusive 46 vs 69%; complementary 33 vs 18%; formula 21 vs 13%; p 0.003) (Table 3).

4. Discussion

Women undergo adaptive physical and psychoemotional changes during puerperium, partly explained by differences in personal characteristics and partly by pharmacological influence of drugs used during labor for induction or augmentation of uterine contractility and by