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Immediate postpartum initiation of etonogestrel-releasing implant: A randomized controlled trial on breastfeeding impact

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Abstract

Background: Breast milk volume has never been evaluated when the etonogestrel (ENG) implant was inserted immediately postpartum. Thus, this study evaluated if the immediate postpartum insertion of the ENG implant alters breast milk volume.

Study design: Twenty-four postpartum women and their newborns (NBs) were randomized into two groups: Implant group (ENG implant inserted within 48 h after delivery) and Control group (absence of contraceptive method). The primary outcome was the amount of breast milk intake by the NBs in the first 6 weeks after delivery. Five and ten grams of deuterium (D_2O) were orally administered to the postpartum women on the day of randomization (day 0) and on the 29th study day, respectively. Saliva samples were collected from the mother–NB pairs prior to each D_2O dose administration and after D_2O ingestion (periodic collection). The amount of breast milk ingested by the NBs was estimated by the amount of deuterium (D_2O) ingested by the NBs through breastfeeding, using mass spectrometry in the saliva samples.

Results: Twenty-four postpartum women and their NB were randomized (12 per group). The median of breast milk intake by NBs following the two D_2O doses were similar between groups {first D_2O dose [Implant: 340 mL/day (240–420 mL/day) vs. Control: 330 mL/day (300–530 mL/day), p=.54]; second D_2O dose [Implant: 845 mL/day (770–980 mL/day) vs. Control: 785 mL/day (680–980 mL/day), p=.63]}. The exclusive breastfeeding rate and NB weight were similar between groups in the first 6 weeks postpartum.

Conclusion: ENG implant insertion immediately postpartum does not alter the volume of breast milk intake by NBs.

Implications: Considering the benefits of immediate postpartum initiation of ENG implant on reducing unintended pregnancy and pregnancy recurrence, especially in vulnerable populations, our study adds safety data on breastfeeding effect of this practice.

Keywords: Contraception; Breastfeeding; Deuterium; Etonogestrel

1. Introduction

The high rates of unplanned pregnancies and short interpregnancy intervals are current concerns triggering social, cultural and economic problems, especially in vulnerable populations with impaired adherence to contraceptive methods. Unplanned pregnancies are associated with increased maternal, neonatal and infant morbidity and mortality [1]. Short interpregnancy intervals are associated with increased risk for preterm births, low birth weight and maternal morbidity [2–4].

Long-acting reversible contraceptives (LARCs) have become an alternative to reduce unplanned pregnancies and pregnancy recurrence. The etonogestrel (ENG)-releasing contraceptive implant is an LARC lasting 3 years, with extremely high efficacy and a 1-year continuity rate higher than 80% [5,6].

Progestogen-only contraceptives (POCs) are usually started 4–6 weeks postpartum; however, 10–40% of

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women fail to show up for their appointment 30 days after delivery and ultimately receive no contraceptive counseling, increasing the risk of a new pregnancy with a short interpregnancy interval [7,8]. Thus, starting contraception immediately postpartum has been suggested as a method to prevent unplanned pregnancies, especially in vulnerable populations [8–10].

The World Health Organization (WHO) had classified the use of the ENG implant immediately postpartum in breastfeeding women as category 3 (the risks outweigh the benefits) because of the lack of studies on the safety of this practice when the WHO criteria were done [11]. However, recently, WHO updated its medical eligibility criteria for contraceptive use and reclassified the ENG implant as category 2 (the benefits outweigh the risks) before 6 weeks of delivery in breastfeeding women [12]. Before the update of the WHO's eligibility criteria, there were other guidelines that already recommend this practice, including the U.S. Medical Eligibility Criteria for Contraceptive Use [13].

A limitation for recommending the early start of POCs is the fear of their effects on breastfeeding. Studies assessing breastfeeding when the ENG implant was inserted immediately after delivery found no changes in the time to lactogenesis stage II, milk composition, breastfeeding failure rate, exclusive breastfeeding rate and newborn (NB) weight at 3 months of life compared to the prescription of POCs in the standard period [9,14]. However, breastfeeding was assessed indirectly, requiring further studies using direct methods to assess the impact of the early start of POCs on the amount of breast milk.

The "gold standard" method for assessing breastfeeding is the stable isotope method [15]. The administration of the deuterium stable isotope (D_2O) to mothers enables salivary assessment of how much of the substance is transferred to the NB through breast milk and estimation of the amount of milk ingested by the NB.

Thus, this study aimed to assess the effect of the ENG implant inserted immediately postpartum on the amount of milk ingested by NBs in the first 6 weeks after delivery using the direct method of assessing breastfeeding.

2. Materials and methods

2.1. Trial design

This randomized, single-blind, parallel and controlled clinical trial was conducted in the Women's Health Reference Center of Ribeirão Preto (Centro de Referência da Saúde da Mulher de Ribeirão Preto), Brazil, which is a low-risk maternity. The trial was registered at ClinicalTrials.gov (www.clinicaltrials.gov; NCT02416687).

2.2. Participants

Postpartum women aged 18 years or older, who agreed to use the ENG implant as a contraceptive method, with body mass index (BMI) <30 kg/m^2, without contraindication to breastfeeding, whose NBs were healthy, without malformations, born at term (gestational age ≥ 37 weeks) and with appropriate weight for gestational age and with normal sucking ability, were included. The subjects had to live in Ribeirão Preto and to have breastfed a child from a previous delivery for at least 3 months. Tobacco smokers, drug addicts or alcoholics; women with educational levels lower than 5 years; women with clinical conditions considered categories 3 and 4 for implant use (except insertion immediately postpartum) by the WHO [11]; women with histories of psychiatric illness; women using medications that could alter the concentration of ENG; women with known allergies to the local anesthetic lidocaine (used to place the implant) and women who wanted to keep their cyclic menstrual bleeding were excluded.

The volunteers were included consecutively immediately after delivery from March to December 2014, after assessment of the inclusion/exclusion criteria. The follow-up period after randomization was 6 weeks.

2.3. Interventions

The women were randomized into one of two groups: (1) Implant group: postpartum women into whom the ENG-releasing contraceptive implant (Implanon®, N.V. Organon, Oss, Netherlands) was inserted in the first 48 h postpartum; and (2) Control group: postpartum women who used no contraceptive method in the first 6 weeks after delivery. The ENG implant was inserted subdermally in the nondominant arm of volunteers upon local anesthesia with 2% lidocaine with vasoconstrictor, according to the manufacturer's instructions. All women signed the informed consent form, and the study was approved by the institutional review board of the maternity.

2.4. Outcomes

The primary outcome was the amount of breast milk intake by the NBs through breastfeeding in the first 6 weeks after delivery. The amount of breast milk ingested by the NBs was estimated by the amount of D_2O ingested by the NBs through breastfeeding. The method of administering D_2O to mothers orally and assessing the substance in the saliva is valid and safe in assessing breast milk intake without negative effects on either the women or their NBs [16–18].

2.5. Sample size

Eight mother–NB pairs would be necessary in each group to identify a 10% difference in the volume of breast milk ingested by the NBs between the two study groups, with 80% power and 5% alpha [16,19]. We increased the number by 50%, assuming loss during the follow-up, reaching 12 volunteers per group.