Assisted reproductive technology and breastfeeding outcomes: a case-control study

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Objective: To determine if breastfeeding outcomes differ between mothers who conceived spontaneously compared with those who conceived with assisted reproductive technology (ART).
Design: Matched case-control study.
Setting: Teaching hospital.
Patient(s): Ninety-four women having a singleton baby conceived with ART, matched by maternal age, parity, mode of delivery, and gestational age to controls who conceived spontaneously.
Intervention(s): Cases and controls were interviewed using a standardized, structured questionnaire, to obtain information on lactation. Exposure to maternity care practices contributing to breastfeeding success was investigated.
Main Outcome Measure(s): Initiation, exclusivity, and continuation of breastfeeding.
Result(s): Cases were as likely as controls to initiate breastfeeding (89.4% vs. 90.4%), but by 6 weeks postpartum, a greater proportion of mothers who conceived through ART has ceased breastfeeding (20.2% vs. 5.3%). The percentage of mothers who exclusively breastfed their child for 6 months was similar among the 2 groups. On univariate conditional logistic regression, a history of using ART was the only predictor of early breastfeeding cessation (odds ratio = 65.3 [95% confidence interval: 1.5–2889.3]).
Conclusion(s): Women who have conceived with ART should be regarded as being at higher risk for early breastfeeding cessation. This study serves as a first step in the investigation of potential modifiable factors that contribute to breastfeeding failure among women who give birth after using ART, and may help in efforts to customize breastfeeding support strategies. (Fertil Steril® 2015;103:89–94. ©2015 by American Society for Reproductive Medicine.)
Key Words: Assisted reproductive technology, breastfeeding, assisted conception, lactation, parenting

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Breastfeeding is recognized as the best source of nutrition for most infants, and exclusive breastfeeding is recommended for the first 6 months of life by many authorities, including the World Health Organization (WHO; 1, 2). Few health behaviors have such a broad-spectrum and long-lasting impact on health status, with the potential to improve life chances, health, and well-being (3, 4).

With births occurring increasingly as a result of assisted reproductive technology (ART), the impact of infertility treatments on initiation and duration of breastfeeding is an important issue to explore. Whereas obstetric outcomes among women who conceive as a result of ART have been extensively studied, only a moderate body of research addresses maternal postnatal adjustment, and psychological aspects of early parenting, after conception with ART (5). The limited evidence about the potential impact of an ART treatment history on breastfeeding capacity is inconclusive and contradictory, mainly because of significant methodological limitations in the studies to date, including recruitment strategies, inadequate sample sizes, lack of appropriate comparison groups, and failure to control for known risk factors for lactation difficulties (6–9).

Women who conceive with ART are more likely to be first-time mothers; they are, on average, older and more likely to have pregnancy complications, multiple births, operative delivery, labor induction, premature birth, and low–birth weight babies than

Received August 7, 2014; revised October 6, 2014; accepted October 7, 2014; published online October 29, 2014.
A.C. has nothing to disclose. M.S. has nothing to disclose. I.C. has nothing to disclose. S.U. has nothing to disclose. S.S. has nothing to disclose. M.A. has nothing to disclose. F.G. has nothing to disclose.
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Fertility and Sterility® Vol. 103, No. 1, January 2015 0015-0282/$36.00

http://dx.doi.org/10.1016/j.fertnstert.2014.10.009

women who conceive spontaneously. Thus, comparisons made with data drawn from the general population of childbearing women need to be interpreted with extreme caution.

Moreover, understanding breastfeeding outcomes requires an exploration beyond maternal and newborn factors that could affect lactation success. Maternity care policy and practices, along with provider and hospital factors, may have an impact on successful breastfeeding (10, 11). Therefore, studies recruiting participants from infertility clinics may fail to control for confounders related to the setting in which a woman gives birth.

We designed a case-control study to investigate initiation, duration, and exclusivity of breastfeeding among every eligible case of women during the study period who had conceived with the help of ART, compared with an appropriately matched control group of patients who conceived spontaneously and gave birth at the same hospital.

MATERIALS AND METHODS

Setting

The study was conducted in the Obstetrics Department of Del Ponte Hospital at the University of Insubria, in Varese, Italy, a teaching and tertiary referral center for high- and low-risk obstetrics. Although the "Baby-Friendly Hospital Initiative" designation (12) was not taken into consideration, the changes required for successful implementation of the "ten steps to successful breastfeeding," developed by WHO and UNICEF (13), had been undertaken at our institution long before the study was conducted. Maternity care practices related to breastfeeding did not change over the study period.

Study Sample

Cases were defined as all women conceiving through ART who gave birth at our institution between January 1, 2010 and October 31, 2013. We included live singleton births, either late-preterm (34 weeks to 36 weeks, 6 days of gestation) or at term (37 weeks to 41 weeks, 6 days of gestation). We created a matched control cohort of women who gave birth with no history of ART. Control births were matched one-to-one by maternal age (within 1 year either way); parity (nulliparous vs. multiparous); type of delivery (planned or unplanned cesarean delivery vs. vaginal birth); and gestational age (within 1 week). Matching on these factors was performed by searching our perinatal database. For each case, we selected as the control the first available patient with the closest delivery date who met all matching criteria.

Mothers were excluded if they had infants with significant congenital defects, or had conditions in which breastfeeding is contraindicated or not encouraged (eg, human immunodeficiency virus infection, psychiatric illness requiring sedating psychotherapeutic drugs, or active substance use that results in cognitive impairment).

Definitions and Terms Used

We adopted the definition of ART as involving homologous in vitro fertilization and embryo transfer (ET). Women undergoing a fertility treatment (ovulation induction or artificial insemination) that did not involve oocyte retrieval or ET were excluded. Pregnancies obtained by gamete and embryo donation were also excluded. The terms used to measure the breastfeeding outcomes for this study are derived from the WHO-recommended definitions (14). Exclusive breastfeeding was defined as infants being fed breast milk only (allowable exceptions were expressed breast milk, oral rehydration solutions, drops or syrups of vitamins, minerals, and medicines).

Data Collection

Mother and infant demographic variables, the mother's medical and obstetric history, and information about labor and delivery were extracted from our computerized, research-quality, perinatal database. Pregnancy and delivery information for all patients who deliver at our center is entered into the database. The database is compiled prospectively by dedicated abstractors to ensure accuracy and minimize missing data; it is reviewed periodically to ensure its accuracy by direct comparison with the Registry of Births and the Hospital Discharge Data System.

Data on breastfeeding outcomes were collected via structured telephone interviews that included study-specific questions. Cases and controls were invited to participate in the study via a telephone call; a telephone interview was scheduled with those who provided express oral consent. Study-specific fixed-choice questions were used to assess initiation, exclusivity, and continuation of breastfeeding. Data on initiation of breastfeeding, and whether mothers were breastfeeding at 6 weeks, were derived from retrospective questions: "Have you ever breastfed your baby?" (yes/no) and "If 'yes,' for how long?" The response alternatives were as follows: <6 weeks; between 6 weeks and 3 months; 4–6 months; >6 months. Data on how the infant was being fed at 3 months and 6 months postpartum were collected (recoded as exclusive breastfeeding, partial breastfeeding, and no breast milk). Timing of introduction of formula was also recorded.

Women who had initiated breastfeeding were asked about their perception of exposure to 6 of the "ten steps to successful breastfeeding" during the postnatal hospital stay. Particularly, we assessed compliance with step 3 (information in pregnancy); step 4 (breastfeed within 1 hour after birth); step 6 (no human milk substitutes); step 7 (room-in), step 9 (pacifiers); and step 10 (postdischarge support). Table 1 presents the questions used to assess exposure to the steps. The exposure variables included: [1] lacking any 1 specific step, and [2] lacking any 2 steps. The construct of interest was "not receiving the care necessary for compliance with the steps." At our institution, research involving analysis of existing data, or the use of surveys when the information is recorded in such a way that individuals cannot be identified, is exempt from formal institutional review board approval requirements.

Data Analysis

We used paired *t* tests for measured outcomes with a symmetrical distribution, and Wilcoxon's signed rank test for