Association between infertility treatment and symptoms of postpartum depression

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Objective: To examine the association between infertility treatment and subsequent symptoms of postpartum depression.
Design: Cross-sectional study.
Setting: Not applicable.
Patient(s): Women who delivered live-born infants from 2009–2010.
Intervention(s): None.
Main Outcome Measure(s): Odds of symptoms of postpartum depression.
Result(s): Data were obtained from the Center for Disease Control and Prevention's Pregnancy Risk Assessment Monitoring System (PRAMS). Data on infertility treatment were available for 16 states in which mothers were sampled 2 to 4 months after delivery to complete the standardized PRAMS questionnaire. Infertility treatment status was as reported on the birth certificate. Maternal mental health was obtained via the maternal questionnaire. Data were analyzed in Stata 12.0 with sample weights to produce population-based estimates. Among the 42,614 women who resided in states in which infertility treatment data were collected, infertility treatment status was missing for 2,277 (5.3%) women. Among the 40,337 eligible women, 12.9% reported feeling down, depressed or sad, and 6.0% reported feeling hopeless. These women were considered to have symptoms of postpartum depression. Even after adjustment for confounders, there was no independent association between infertility treatment status and symptoms of postpartum depression. In contrast, having a child admitted to neonatal intensive care, smoking, experiencing a higher number of stressors in the 12 months before delivery, and a history of having prepregnancy mental health care were associated with an increased odds of having symptoms of postpartum depression.
Conclusion(s): In a population-based sample of U.S. women, conceiving with the help of infertility treatment did not increase the odds of experiencing symptoms of postpartum depression. (Fertil Steril® 2014;102:1416–21. ©2014 by American Society for Reproductive Medicine.)
Key Words: Infertility treatment, in vitro fertilization, postpartum depression

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Both infertility (defined as the absence of pregnancy despite 12 months of regular unprotected intercourse) and infertility treatment are profound stressors for reproductive-age women who desire a child but experience difficulty getting pregnant or carrying the pregnancy to term. It is estimated that between 4.3 and 9.5 million women in the United States are infertile, defined as 1 year or more of regular heterosexual intercourse without contraception or identified pregnancy (1–3). This represents 7.0% to 15.5% of women ages 15 to 44 years (2, 3). In 2012, over 176,275 assisted reproductive technology (ART) cycles were performed in the United States, resulting in 65,179 live-born infants (over 1% of the infants born that year) (4).

Women seeking infertility treatment have been shown to be more highly stressed than women in the general population (5). A study in the United Kingdom found that 19.1% of infertile women were so distressed that they felt that they needed counseling (6). Olivius et al. (7) found that the number one reason for discontinuation of treatment with in vitro fertilization (IVF) was psychological burden, even when up to three cycles were offered free of charge. Although studies have found that women who

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are undergoing IVF report higher levels of depression than their partners (8–10), they do not appear to report more depressive symptoms than other women of reproductive age (11, 12). Though it has been suggested that this is perhaps because women undergoing IVF are less forthcoming because they wish to appear psychologically healthy for fear that their treatment might be canceled due to psychological concerns (12, 13).

The transition to motherhood can be a challenging and stressful time, even for women who conceive naturally. There is some concern that previously infertile women who eventually have a child also experience stress during this transition time, but at the same time they might be less likely to report it or to confide in someone for fear of complaining about something that they are trying so hard to achieve (i.e., having a child) (14). The usual outlets for these normal emotions may be limited in women undergoing infertility treatment.

Because women with preexisting depression are at heightened risk of postpartum depression, women who achieve pregnancy through infertility treatment might be at increased risk as a result of the distress associated with their infertility and infertility treatment. Perinatal depression is defined as experiencing a depressive episode during pregnancy or within the 12 months after delivery (15). Perinatal depression is common, affecting one in seven U.S. mothers (15). Although the terms are often used interchangeably, postpartum depression, in contrast, is defined by the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* (DSM-V) to be onset of a major depressive episode with onset during pregnancy or within 4 weeks of delivery (16).

Some studies have indicated that women who undergo infertility treatment are at increased risk of anxiety and depression during the pregnancy and postpartum periods (17–19), but others have not found that to be the case (20, 21). The key challenge in examining this issue is appropriate control for confounding, specifically the effects preconceptional mental health history and multiple births, which are increased among pregnancies conceived with the help of infertility treatment. In an effort to overcome the limitations of previous work, we used population-based data from the Centers for Disease Control and Prevention (CDC) Pregnancy Risk Assessment Monitoring System (PRAMS) to assess whether there is association between infertility treatment status and the odds of symptoms of postpartum depression.

MATERIALS AND METHODS

Data and Study Design

We used cross-sectional population-based national data from PRAMS from 2009 to 2010. Data on infertility treatment were available for 16 states including Colorado, Delaware, Georgia, Maryland, Nebraska, New York, Ohio, Oklahoma, Oregon, Pennsylvania, Tennessee, Texas, Utah, Vermont, Washington, and Wyoming. In brief, the participating states drew a sample of 100 to 250 birth certificates a month and attempted to contact the mothers 2 to 4 months after delivery to complete the standardized PRAMS questionnaire. Selected women were first contacted by mail; if there was no response, the women were contacted directly and an attempt was made to interview them by telephone. Each mother's responses were then linked to extracted items from the birth certificate. Data were assigned a sampling weight to adjust for nonresponse to produce population-based estimates. Further details regarding the PRAMS methodology are available elsewhere (22).

Exposure

Infertility treatment status was coded as yes or no as recorded on the birth certificate. Birth certificate wording varies by state, but the suggested wording on the U.S. Standard Certificate of Live Birth checkbox says, "Pregnancy resulted from infertility treatment—if yes check all that apply: (1) fertility enhancing drugs, artificial insemination or intrauterine insemination; or (2) assisted reproductive technology (e.g., in vitro fertilization (IVF), gamete intrafallopian transfer (GIFT))." If one or both of the boxes were checked, women were coded as having received infertility treatment to achieve the index pregnancy.

Outcome

The PRAMS questionnaire queried women about symptoms of postpartum depression. Specifically, women were asked to indicate using a Likert scale how often they felt each of the following since their new baby was born: [1] I felt down, depressed, or sad; [2] I felt hopeless; or [3] I felt slowed down. Women were categorized as exhibiting the symptom if they responded "often" or "always." The questions used to assess symptoms of depression do not arise from a standard postpartum depression questionnaire; rather, they were developed and pretested and have been used for many years by the CDC.

Covariates

Covariates included from the linked birth certificates included race of the mother, age of the mother at delivery, mother's education level, whether or not the index infant was admitted to the neonatal intensive care unit (NICU) after delivery, mother's history of a prepregnancy visit with a health-care provider for mental health reasons, maternal smoking status in the last 3 months of pregnancy, and plurality of the index pregnancy. Information taken from the maternal questionnaire included symptoms of postpartum depression, history of a mental health visit, and number of stressors in the 12 months before the index child was born. Stressors considered include a close family member was admitted to the hospital; separation or divorce; moving to a new address; being homeless; husband or partner lost job; lost own job; argued with husband or partner more than usual; husband or partner did not want woman to be pregnant; woman had bills that she could not pay; woman was in a physical fight; husband, partner, or woman went to jail; someone close to the woman had a problem with drinking or drugs; or someone close to the woman died. To assess history of a mental health visit, women were asked if in the 12 months before they had their new baby they had visited a health-care worker to be checked or treated for anxiety or depression.