Assisted conception is a risk factor for postnatal mood disturbance and early parenting difficulties

Jane R. W. Fisher, Ph.D.,[a] *Karin Hammarberg, M.W.H.,*[a] *and H. W. Gordon Baker, Ph.D.*[b,c]

[a] Key Centre for Women's Health in Society, School of Population Health, and [b] Department of Obstetrics and Gynaecology, University of Melbourne, Melbourne, Victoria; and [c] Melbourne IVF and Reproductive Services, Royal Women's Hospital, Carlton, Victoria, Australia

Objective: To investigate whether assisted conception is associated with an increased risk of admission to a residential early parenting program for treatment of maternal mood disorder or infant feeding or sleeping disorders in the postpartum year.
Design: Systematic audit of consecutive medical records.
Setting: Masada Private Hospital Mother Baby Unit (MPHMBU), Melbourne, Australia.
Patient(s): Medical records of all mother-infant dyads admitted to MPHMBU between July 2000 and August 2002.
Intervention(s): None.
Main Outcome Measure(s): Modes of conception and delivery of index infant, maternal and infant age on admission, multiplicity of birth, infant birth weight, and Edinburgh Postnatal Depression Scale scores.
Result(s): A total of 745 records were audited, and mode of conception was recorded in 526 (70.6%) of records. Overall 6% (45/745) of the admitted infants had been conceived through assisted reproductive technologies compared with 1.52% in the general population (relative risk 4.0; 95% confidence interval, 3.0–5.4). Mothers who had conceived with assisted reproductive technologies were older and more likely to have had cesarean and multiple births than those who conceived spontaneously.
Conclusions: Assisted conception appears to be associated with a significantly increased rate of early parenting difficulties. Women who experience assisted conception may require additional support before and after their babies are born. (Fertil Steril® 2005;84:426–30. ©2005 by American Society for Reproductive Medicine.)

Key Words: ART conception, postpartum depression, parenting difficulties

In 1996, Masada Private Hospital in Melbourne opened a Mother Baby Unit (MPHMBU). It provides clinical assessment of and treatment for women referred with infant sleeping and feeding disturbance and a range of maternal health problems including mild to moderate depression, anxiety disorders, and clinically significant maternal exhaustion in the first 12 months postpartum. Treatment involves individualized supported education in infant care and participation in a structured psychoeducational program during a five-night residential stay. Approximately 375 mother-infant dyads are admitted annually (1).

To obtain more comprehensive knowledge of the health needs of these mothers and infants, a systematic survey was undertaken in 1997. A consecutive cohort of women admitted to the unit was invited to complete a detailed self-report questionnaire about their health and social circumstances (2). It included a question about conception of the index pregnancy because a previous descriptive study of mothers and infants admitted to a New South Wales residential early parenting center reported that 9% of these women had previous infertility but mode of conception of the infants was not described (3). In all, 109 of 146 (75%) eligible patients in the 1997 study completed the questionnaire, of whom 7 of 107 (6.5%) had conceived with assisted reproductive technologies (ART), an apparent five-fold overrepresentation compared with the national rate of 1.2% assisted conception births at that time (4, 5). As a result of this unexpected finding, a new question about mode of conception was added to the MPHMBU nursing admission assessment form in June 2000.

The primary aim of this study was to investigate whether the apparent elevated rate of assisted conceptions in the population of women admitted with their infants to MPHMBU observed in 1997 was a consistent or a chance finding. The second aim was to assess whether women

Received May 5, 2004; revised and accepted February 2, 2005.
This research was supported by a grant from the Fertility Society of Australia.
Reprint requests: Jane R. W. Fisher, Ph.D., Key Centre for Women's Health in Society, School of Population Health, University of Melbourne, Melbourne, Victoria, Australia 3010 (FAX: 61-3-9347-9824; E-mail: jrwf@unimelb.edu.au).

0015-0282/05/$30.00
doi:10.1016/j.fertnstert.2005.02.016

admitted to the unit with infants conceived by ART differed from other admitted mothers in rates of other risk factors for perinatal psychological adjustment difficulties or severity of self-reported mood disturbance.

MATERIALS AND METHODS

A systematic audit of consecutive medical records of mother-infant dyads admitted to MPHMBU between July 1, 2000, and August 31, 2002, was conducted. Each record was drawn and reviewed on site by two midwife researchers who were independent of the clinical treatment team. Nonidentifying data including maternal and infant age, modes of conception and delivery, infant birth weight, and singleton or multiple birth were collected from the nursing admission form and the clinical notes. Mode of conception was recorded as spontaneous, by ovulation induction or artificial insemination, or by ART, which included all procedures involving oocyte retrieval. Mode of delivery was categorized as vaginal or by cesarean section. Scores from the 10-item self-report Edinburgh Postnatal Depression Scale (EPDS) (6) that is routinely completed on days 1 and 5 of the treatment program were also recorded. The EPDS yields both a continuous measure of emotional distress and clinical categorization, with a score of >12 indicating likely major depression with a sensitivity of 100%, specificity of 95.7%, and positive predictive value of 69.2% (7). Records were surveyed a single time in an irreversible process.

State-based perinatal data services gather obstetric information about every birth in Australia. In addition, all ART centers in Australia and New Zealand are required to submit data on pregnancy rates, pregnancy outcomes, multiple birth rate, and neonatal health to the Australian Institute of Health and Welfare's National Perinatal Statistics Unit (NPSU). The NPSU produces annual summaries on all pregnancies and infants conceived through IVF, intracytoplasmic sperm injection, and gamete intrafallopian transfer. It does not collect data about other forms of fertility treatment, including ovulation induction and artificial insemination.

Australia is divided into districts that are identified by postcodes, which are a reliable indicator of socioeconomic status. The postcodes of all women admitted to the MPHMBU in 2000 were collected from the hospital's database. Total births to women in these postcodes in 2000 were obtained from the Victorian Perinatal Data Collection Unit (VPDCU), and the number of these that followed assisted conception was obtained from the NPSU. Birth rates after ART in the background population were calculated as a proportion of total births.

Data was entered into a password-protected SPSS version 12 (SPSS, Chicago, IL) spreadsheet and analyzed using univariate measures of association.

Approval to conduct this study was obtained from the University of Melbourne's Human Research Ethics Committee and the Avenue Hospital Research and Ethics Committee.

RESULTS

In all, 745 records were drawn and scrutinized. Mode of conception was recorded as spontaneous in 469 (63%) cases, ART in 45 (6%), and assisted with ovulation induction or artificial insemination in 12 (1.5%). In 219 (29.4%) records mode of conception was not documented. The ART conception rate was similar to that found in the original study and suggests that it was a consistent and not a chance finding. There were no significant differences between the ART conception rates in each of the 3 years that were sampled (2000, 6.0%; 2001, 6.1%; 2002, 6.4%; $\chi^2_2 = 0.02$, NS).

The clinical team reviewing the inadequate recording of mode of conception revealed in this study found that some members of staff were unaware of the changed admission assessment requirement, suggesting that failure of recording was random. The rates of all forms of assisted conception reported here might therefore be underestimates, but for further analyses it was presumed that all unrecorded conceptions were spontaneous.

Women were admitted to the MPHMBU from 107 different Victorian postcode districts in 2000. A total of 24,059 live births were recorded by the VPDCU to women residing in these postcode districts in 2000, and the NPSU recorded that 366 of these followed assisted conception. The rate of live births after ART in this population of 1.52% was comparable to the national rate in that year of 1.9% (8). There was a significant difference between rates of admission of mothers conceiving through ART and those conceiving spontaneously ($\chi^2_1 = 91.77$, $P<.001$), and the relative risk (RR) of admission to MPHMBU associated with ART conception was 4.0 (95% confidence interval [CI], 3.0–5.4). Only limited additional sociodemographic data were available on the medical records, but women in the ART conception group were as likely to be multiparous as the rest of the admitted population.

The severity of self-reported mood disturbance in women is summarized in Table 1. In a longitudinal study of a community population of >12,000 parturient women by Evans et al. (9) in 2001, mean (SD) EPDS scores were reported as 5.84 (4.65) at 8 weeks and 5.25 (4.61) at 8 months postpartum. The mean admission EPDS scores of the sample described here are significantly higher than both the 8 weeks ($t = 36.7$; $P<.0001$; 95% CI, 6.16–6.86) and the 8 months scores ($t = 40.0$; $P<.0001$; 95% CI, 6.75–7.45). In the current study there were no differences in mean EPDS scores or in the proportion scoring in the clinical range of >12 by mode of conception.

In this cohort, women who conceived with ART were more likely to be older, have operative and multiple births, and have infants of lower birth weight than those who conceived spontaneously (see Table 2).