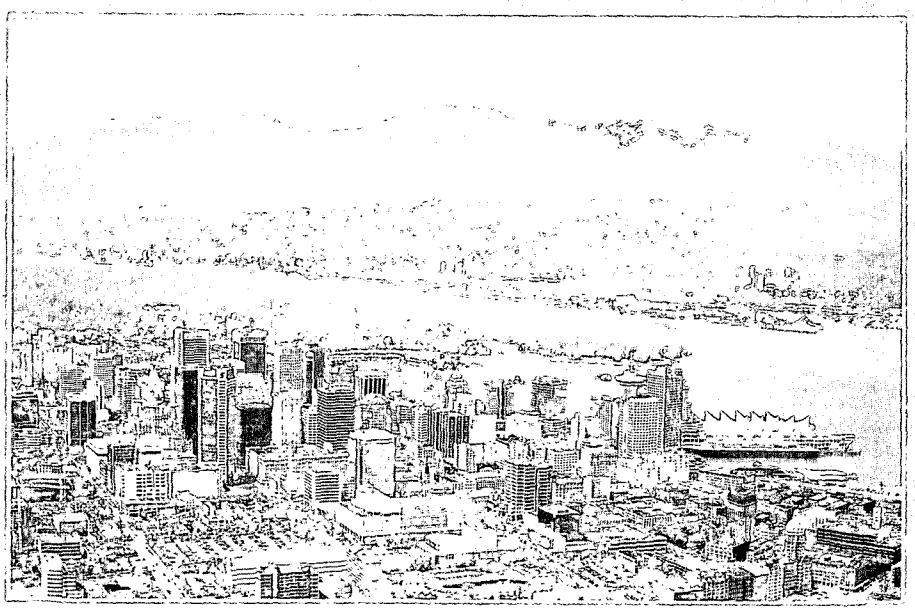
REPRINTED FROM:

IN VITRO FERTILIZATION AND ASSISTED REPRODUCTION

Proceedings of the
10th World Congress of in Vitro Fertilization
and Assisted Reproduction

Vancouver (Canada), May 24-28, 1997

Editors
VICTOR GOMEL, M.D.
PETER C.K. LEUNG, Ph.D.



MONDUZZI EDITORE

INTERNATIONAL PROCEEDINGS DIVISION

10th World Congress on
IN VITRO
FERTILIZATION AND
ASSISTED
REPRODUCTION

Vancouver, Canada
24-28 May 1997

A study to determine if a shared donor oocyte program adversely affects the pregnancy rates (PRs) of the donors

M. PEYMER, J.H. CHECK, J. CHOE and C. FISHER

The University of Medicine and Dentistry of New Jersey
Robert Wood Johnson Medical School at Camden
Cooper Hospital/University Medical Center
Department of Obstetrics and Gynecology
Division of Reproductive Endocrinology and Infertility, Camden, NJ (USA)

SUMMARY

The purpose of this study was to see if pregnancy rates (PRs) differed between the oocyte donor and the recipient in 83 cycles where the pool of oocytes was shared. The PR for the donors was 20.5% as compared to 25.3% for the recipients (p=NS, McNemar test). The implantation rates were 10.5% and 10.2%, respectively. For infertile women not sharing their oocytes, the PR and implantation rate were 23.3% and 10.0%, respectively. These data demonstrate that infertile women can be a good source of donor oocytes without reducing their own chance of conceiving.

INTRODUCTION

The most common form of oocyte donation has been the donation of a cohort of oocytes from a healthy fertile woman to an infertile woman (Sauer et al, 1991; Flamigni, 1993). These donors have been both anonymous and

known to the oocyte recipient. Most have been paid for their oocytes to compensate for the time and pain involved in undergoing ovarian stimulation and oocyte retrieval. These donors, however, were at risk of developing complications from the medical procedures involved.

Another donor source has been infertile women who require assisted reproductive techniques (ART) (Check et al, 1992). These women in many cases were unable to seek treatment because of financial constraints. Thus, they were willing to participate in a shared oocyte program in which they donated half of their cohort of oocytes to a recipient in return for financial assistance with their own ART. Unlike the fertile donors, these women must undergo medical procedures as part of their own treatment.

One ethical issue that has been debated about shared oocyte programs is whether an infertile oocyte donor is at a disadvantage because she is less likely to achieve a pregnancy than the oocyte recipient from the same cohort of oocytes. The objective of this study was to ascertain whether the PRs differed between donors and recipients in a shared oocyte program. Pregnancy rates for the donors were also compared to those of infertile women undergoing standard in vitro fertilization (IVF) during the same time period, but who were not sharing their oocytes.

MATERIALS AND METHODS

Eighty-three infertile women elected to participate in the shared oocyte program at the Cooper Center for IVF between April, 1994 and April, 1996. These donors fully understood the nature and implications of their contribution and consented to participate. Medically, the donors demonstrated that despite their infertility problems, they had normal ovarian reserve as measured by basal follicle stimulating hormone (FSH) levels (<10 mIU/mL, Boehringer Mannheim Corp., Indianapolis, IN). None were older than 35 years. The donors were treated for tubal factor (38.5%), endometriosis and/or pelvic adhesions (6.0%), male factor (19.3%), ovulatory dysfunction (4.8%), unexplained infertility (4.8%), and multiple factors (26.5%). They ranged in age from 25 to 35 years with a mean age of 30.9 ± 2.5 years.

Donors underwent ovarian stimulation using the luteal phase leuprolide acetate/human menopausal gonadotropin (LA/hMG) protocol (Meldrum et al, 1989). Following oocyte retrieval, half of the oocyte cohort was randomly selected to be given to the recipient. Laboratory procedures for fertilization of oocytes and culturing of embryos were identical for both donors and recipients. One cycle per donor was used to obtain independent observations for the statistical analysis.

Each donor shared her oocyte cohort with one recipient. Thus, there were 83 recipients in the study. Thirty-three of the recipients were in complete ovarian failure; 50 still had limited ovarian function. They ranged in age from 24 to 52 with a mean of 40.1 ± 6.9 years. Recipients interested in participating in the program, were provided with a list of donor characteristics and asked to select a donor. When the match was completed, the recipient agreed to fund the IVF cycle for the donor in return for half of the pool of oocytes. In most cases, the donor was anonymous.

Prior to embryo transfer (ET), the recipients underwent hormone replacement therapy either with or without down regulation. For hormone replacement, the recipients were given estrace and progesterone (P) replacement. If down regulation was necessary, it was achieved through the

use of LA (Devroey et al, 1989). If donor and recipient cycles could not be synchronized, all embryos were cryopreserved and transfer deferred.

The outcome of the donors' cycles were also compared to that of a control group of 227 women of similar age and infertility types who underwent standard IVF-ET using the identical stimulation protocol (luteal phase LA/hMG), but without sharing their oocytes. These women ranged in age from 23 to 35 with a mean of 31.4±2.7. They were treated for tubal factor (26.0%), endometriosis and/or pelvic adhesions (10.1%), male factor (17.2%), ovulatory dysfunction (2.6%), unexplained infertility (11.0%), and multiple factors (33.0%).

The main outcome variables were the clinical PR/transfer and implantation rate/embryo. Clinical pregnancy was defined as sonographic evidence of a gestational sac in the uterus; implantation rates were number of gestational sacs per embryos transferred. If ET was deferred, the outcome of the first frozen ET was used.

McNemar's test for matched proportions was used to compare the PRs for donor and recipients. Chi-square analysis was used to compare the PR and implantation rates for donors and controls. Paired t-tests were used to compare the fertilization rate and mean number of embryos transferred for donors and recipients. A p value of .05 was used.

RESULTS AND CONCLUSIONS

Following ovarian stimulation, the donor on average produced a cohort of 21.0±9.7 oocytes (range 4-47, median 18), of which half were donated to the recipient. The mean fertilization rates were 57.2±25.0% for the donors and 62.3±23.2% for the recipient (p=NS, paired t-test). For their first ET, the donors had an average of 3.1±.9 embryos transferred, the recipients had on average 3.7±.9 embryos transferred (p=NS, paired t-test). Women undergoing standard IVF had on average 19.2±8.6 oocytes retrieved, a fertilization rate of 57.5±21.5% and on average 3.4±3.0 embryos transferred.

There were 17 (20.5%) clinical pregnancies achieved by the donors and 21 (25.3%) clinical pregnancies achieved by the recipients (p=NS, McNemar test). In 49 pairs neither donor nor recipient conceived; in 4 pairs, both achieved a pregnancy; in 17 pairs, the recipient conceived, but the donor did not; and in 13 pairs the donor conceived, but the recipient did not. The implantation rates were 10.0% and 10.2%, respectively. The PR and implantation rates for the control group who underwent standard IVF were 23.3% (53/227) and 10% (78/781); they did not differ from those of oocyte donors.

The PRs for recipients did not differ by ovarian function. For those recipients with complete ovarian failure, the PR and implantation rates were 27.3% and 11.8%, respectively. For those with ovarian function the rates were 24.0% and 9.1%, respectively.

Recently, Cooper Center for IVF-ET has modified the transfer technique which has considerably improved pregnancy and implantation rates. There were 5 donor-recipient pairs since the change. Pregnancy rates and implantation rates for donors vs recipients were 4/5 (80%) and 31.2%, respectively, for the donors, versus 3/5 (60%) and 33.3%, respectively, for the recipients. Comparable data for non-donors during this time period were: PR 5/6 (83.3%) and implantation rate (28.6%).

The shared oocyte system for donor oocytes has several advantages over paid donor programs: less unnecessary medical risk for the donor and

reduced cost. Whenever a woman undergoes controlled ovarian hyperstimulation, she runs the risk of complications, e.g., ovarian hyperstimulation syndrome (OHSS). Young fertile donors are at even greater risk for OHSS than older infertile women needing IVF and willing to share oocytes. It is also cheaper for the recipient in the shared oocyte program because an additional fee for the fertile donor does not have to be provided. The shared program also allows some patients with limited finances to have IVF-ET as donors; otherwise it would be cost-prohibitive.

However, despite these apparent advantages, some clinicians have questioned the ethics of a shared oocyte program. One of the main criticisms is that the donor, by giving away half of her oocytes, may not have sufficient number to allow a normal PR. The data presented herein clearly demonstrate that PRs and implantation rates for the donor are comparable to other patients undergoing IVF-ET not sharing oocytes and also similar to the rates of recipients.

Across the board, the PRs and implantation rates for non-donors undergoing IVF up to age 36 were 23.3% and 10.0% compared to 20.5% and 10.5% for oocyte donors and 25.3% and 10.2% for recipients.

One could argue that PRs for recipients using oocytes from fertile donors may be higher. However, paid donors are not always available or affordable. Since respectable PRs can be obtained from donors in a shared program this a reasonable alternative. Furthermore, since recent modifications in our technical procedures have considerably increased the PR and implantation rates, this alternative is even more attractive.

In conclusion, the shared oocyte program allows a greater pool of oocytes to be available to women with ovarian failure or perimenopause. It also allows some women to undergo IVF-ET who otherwise would be precluded because of expense. The donors do not reduce their chance of achieving pregnancies on their first ET, but obviously reduce the number of subsequent chances of conception by frozen ET.

REFERENCES

1. Check JH, Nowroozi K, Chase J, Nazari A, Braithwaite C. Comparison of pregnancy rates following in vitro fertilization-embryo transfer between the donors and recipients in a donor oocyte program. J Assist Reprod Genet 9:248-250;1992.

2. Devroey P, Smith J, Camus M, Wisanto A, Deschacht J, Van Waesberghe L, Van Steirteghem AC. Synchronization of donor's and recipient's cycles with GnRH analogues in an oocyte donation program. Hum Reprod 4:270-274;1989.

3. Flamigni C. Egg donation to women over 40 years old. Hum Reprod 8:1343-1344;1993.

4. Meldrum DR, Wisot A, Hamilton F, Gutlay AL, Kempton W, Huynh D. Routine pituitary supplementation with leuprolide before ovarian stimulation for oocyte retrieval. Fertil Steril 51;455-459;1989.

5. Sauer M, Paulson R, Macoso T, Francis M, Lobo R. Oocyte and pre-embryo donation to women with ovarian failure: an extended clinical trial. Fertil Steril 55:39-43;1991.

MONDUZZI EDITORE

Via Ferrarese, 119/2 - 40128 Bologna, Italy

Tel ...39-51-370337 - Fax ...39-51-370529