

Reprinted from

FERTILITY AND STERILITY

Progress in Research and Practice

The Proceedings of the
XIV World Congress on Fertility and Sterility
Caracas, Venezuela, November 1992

Edited by O. Rodríguez-Armas
Co-edited by W. Baumgartner and L. Burgos-Briceño



The Parthenon Publishing Group
International Publishers in Medicine, Science & Technology

LONDON

NEW YORK

Comparison of pregnancy rates in donors compared with recipients in a shared oocyte program

J. S. Chase, A. Nazari, A. Baker, J. H. Check and J. Choe

INTRODUCTION

Pregnancy rates are higher following the transfer of embryos to functionally agonadal women. This is achieved by fertilization of donor oocytes by sperm from the recipient's male partner¹⁻⁴. The oocytes are donated by predesignated donors, relatives or friends of patients, and co-participants in gamete intrafallopian transfer (GIFT) or *in vitro* fertilization embryo transfer (IVF-ET) programs^{5,6}. Most assisted reproductive technology programs have the availability of cryopreservation of embryos formed from fertilization of 'extra' oocytes. It is therefore much more difficult to find women who are undergoing IVF-ET or GIFT and willing to share extra oocytes because they may prefer to have their oocytes preserved for a future attempt at achieving a pregnancy.

A large number of recipient volunteers were enlisted to share oocytes with the donors. The present study was conducted to evaluate and compare the outcome of donors and the recipients who shared equally in the donor's oocytes.

MATERIALS AND METHODS

Patients undergoing IVF-ET were given the option of sharing half of their oocytes retrieved with a recipient in premature ovarian failure in exchange for assistance with the cost of the IVF procedure. All retrieved eggs

Table 1 Summary of comparison of 92 cycles of *in vitro* fertilization using shared oocytes with donors and recipients

	Donors	Recipients
Number of patients	65	50
Average no. oocytes transferred	3	3
Number of pregnancies (%) [*]	9 (10)‡	17 (10)
Rate of implantation (%)	4	9
Spontaneous abortions (%)	55	35
Number with multiple births ^{**}	0	4†
Total number of births	5	17

^{*} χ^2 analysis, $p < 0.01$; ^{**}Fisher's exact test, $p < 0.02$; †three sets of twins, one set of triplets; ‡pregnancy rate/cycle

were equally distributed between the donor and recipient based on morphological criteria. The long leuprolide acetate-human menopausal gonadotropin (hMG) regimen was used for controlled ovarian hyperstimulation (COH) of the donor⁷. Recipients received a gradually increasing dose of estradiol (Estrace, 2 mg), which was initiated on the donor's 6th day of leuprolide acetate, and 50 mg progesterone (intramuscular) starting with the human chorionic gonadotropin (hCG) injection of the donor.

There were generally more recipients than donors at any given time. Rarely was a patient rejected as a donor unless she was over 40 years old. Each recipient was selected according to the time of registration. After having received details of the donor's physical characteristics, education and medical history, if a given recipient chose to reject the donor, the next recipient chronologically, was offered the next available donor. If a donor's oocytes were used in more than one cycle, the recipient was presented the details of the previous IVF cycles.

All donor-recipient cycles from 1 January, 1989 to 31 December, 1990 were included in the study. The results of the donor-recipient cycles for both donors and recipients were compared; χ^2 analysis and Fisher's exact tests were used to analyze all the data.

RESULTS/DISCUSSION

There were 92 cycles of IVF performed in which the donor and the recipient shared oocytes (Table 1). Despite the transfer of approximately the same number of embryos, the recipients were found to have a higher pregnancy rate (18%) than the donors (10%). The recipients also had fewer spontaneous abortions; the spontaneous abortion rate was 35% in the recipients compared to 55% in donors. Multiple births occurred in

the recipients, but not the donors, and the difference between the two groups was even greater when the total number of births was considered. Although there were no apparent differences in the quality of embryos transferred in donors or recipients, the implantation rate per embryo was 8.5% for recipients and only 3.6% for the donors.

Although the recipients were infertile women who received only half of the available pool of oocytes, they had a good chance of conception following transfer of embryos developed from fertilized donor oocytes. Unfortunately, the donor's chances of conception fell significantly below the level of a non-donor. Nevertheless, some patients would rather undergo the IVF procedure by sharing oocytes even with the reduced probability of pregnancies because otherwise they could not afford IVF at all. If one has an anonymous pre-designated donor available, dividing the oocytes between two recipients to lower the cost to each and decrease the risk of multiple gestations is a reasonable clinical option⁸.

de Ziegler and Frydman reported higher pregnancy rates from the transfer of cryopreserved-thawed embryos originating from prior donor oocyte cycles compared with those originating from regular IVF cycles⁹. Their data suggested that either the source of oocytes from more fertile donors, the uterus of women with ovarian failure may be more sensitive to implantation, or perhaps there is a reduced chance of implantation in the donors, possibly related to endometriosis¹⁰. Their data refute the concept that the hyperstimulation regimen used in IVF reduces the chances of a negative effect on pregnancy rates from IVF-ET. Using a shared common pool of oocytes, our data clearly demonstrated that the explanation for higher pregnancy rates in the recipients was not related to the quality of the oocytes at retrieval or at transfer. Combining our data with those of de Ziegler's, it would appear that the most likely mechanism for the improved pregnancy rate in the recipients is related to either a better milieu for implantation in the recipients or decreased receptivity in the donors.

ACKNOWLEDGEMENTS

The authors would like to thank Sandy Ehrlich for her help in preparing the manuscript, Ahmad Nazari, M.D. for his assistance in retrieving oocytes and transferring embryos, and the embryologists for their expertise.

REFERENCES

1. Lutjen, P., Trounson, A., Leeton, J., Findlay, J., Wood, C. and Renov, P. (1984). The establishment and maintenance of pregnancy using *in vitro* fertilization

- and embryo donation in a patient with primary ovarian failure. *Nature (London)*, **307**, 174-5
2. Rosenwaks, Z. (1987). Donor eggs: their application in modern reproductive technologies. *Fertil. Steril.*, **47**, 895-909
 3. Asch, R. H., Balmaceda, J. P., Ord, T., Borrero, C., Cefalu, E., Gastaldi, C. and Rojas, F. (1988). Oocyte donation and gamete intrafallopian transfer in premature ovarian failure. *Fertil. Steril.*, **49**, 263-7
 4. Meldrum, D. R., Wisot, A., Hamilton, F., Gutlay-Yeo, A. L., Marr, B. and Huynh, D. (1989). Artificial agonadism and hormone replacement for oocyte donation. *Fertil. Steril.*, **52**, 509-11
 5. Formigli, L., Roccio, C., Belotti, G., Stangalini, A., Coglitore, M. T. and Formigli, G. (1989). Oocyte donation by gamete intrafallopian transfer to amenorrhoeic and cycling patients given replacement steroids. *Hum. Reprod.*, **4**, 772-6
 6. Sauer, M. V., Paulson, R. J., Macaso, T. M., Francis-Hernandez, M. and Lobo, R. A. (1989). Establishment of a nonanonymous donor oocyte program: preliminary experience at the University of Southern California. *Fertil. Steril.*, **52**, 433-6
 7. Meldrum, D. R., Wisot, A., Hamilton, F., Gutlay, A. L., Gempton, W. and Huynh, D. (1989). Routine pituitary suppression with leuprolide before ovarian stimulation for oocyte retrieval. *Fertil. Steril.*, **51**, 455-9
 8. Sauer, M. V., Paulson, R. J. and Lobo, R. A. (1989). Simultaneous establishment of pregnancies in two ovarian failure patients using one oocyte donor. *Fertil. Steril.*, **52**, 1072-3
 9. de Ziegler, D. and Frydman, R. (1990). Different implantation rates after transfers of cryopreserved embryos originating from donated oocytes or from regular *in vitro* fertilization. *Fertil. Steril.*, **54**, 682-8
 10. Check, J. H. (1991). Uterine receptivity in subjects with ovarian failure. *Fertil. Steril.*, **55**, 1208-9