

**Reproductive Biology Section**

# A reassessment of comparative pregnancy and implantation rates following embryo transfer in recipients vs their infertile donors also trying to conceive in the background of performing salpingectomy for hydrosalpinx

**B. Katsoff, J.H. Check, F. Fox, J.K. Choe, K. Iacone**

*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 & Infertility, Camden, N.J. (USA)*

**Summary**

**Purpose:** To compare pregnancy and implantation rates in egg donors trying to conceive vs their recipients in the background of salpingectomy for hydrosalpinx prior to IVF-ET.

**Methods:** A retrospective six-year review of all donor egg cycles where the eggs are supplied by an infertile donor trying to conceive herself was carried out. Salpingectomy for hydrosalpinx was performed prior to IVF-ET.

**Results:** Clinical and delivered pregnancy rates (PRs) following fresh ET were not significantly different in donors vs recipients (60.0%, 45.8% vs 56.8%, 50.8%). Implantation rates were 27.3% vs 32.6%. The respective implantation rates following frozen ET were 13.8% and 14.4%.

**Conclusions:** In the background of salpingectomy for hydrosalpinges the much higher PRs in recipients vs donors is no longer seen. The trend for higher implantation rates in recipients (about 20%) following fresh but not frozen transfer could still reflect some adverse effect of the controlled ovarian hyperstimulation regimen in a minority of women.

**Key words:** Hydrosalpinx; Salpingectomy; Shared oocytes; Donor; Recipient.

**Introduction**

A study over ten years ago of donor egg recipients found comparable implantation and clinical pregnancy rates in recipients < 40 vs those  $\geq$  40 [1]. These data from Sauer *et al.* suggested that uterine senescence does not seem to be a big factor in human conception [1].

This concept was supported by a study of shared donor-oocytes in which, despite a common oocyte pool, the older recipients had higher clinical, ongoing/delivered, and implantation rates than the donors [2]. These data had been interpreted that there had to be some factor in the donors having an adverse effect on implantation. One of these factors may have been the more likely presence of hydrosalpinges in donors vs recipients. Hydrosalpinges are well known to adversely affect implantation [3-5]. Another factor, however, could be an adverse effect of the controlled ovarian hyperstimulation regimen on the uterine environment.

Today most in vitro fertilization (IVF) centers surgically remove the infected tubes or cauterize them [6-8].

The present study reevaluated infertile donor-recipient pregnancy rates in the post salpingectomy for hydrosalpinx era to determine if the significantly higher

pregnancy rates previously found in the recipients would no longer be found suggesting that hydrosalpinges rather than controlled ovarian hyperstimulation was largely responsible for marked differences previously seen.

**Materials and Methods**

A retrospective review over a six-year period was performed for shared-donor oocyte cycles where egg donors were  $\leq$  35 years old.

In the shared oocyte program an infertile donor shares half of the oocytes collected with a recipient in exchange for the recipient paying for the IVF cycle [9].

To cover the possible confounding variable of an adverse effect of the controlled ovarian hyperstimulation regimen, outcome was also compared with the first frozen embryo transfer if a successful pregnancy did not occur.

Only IVF cycles where both the donors and the recipients received fresh transfers were included.

**Results**

The mean age for recipients was 41.9 (SD 5.6) and for donors 31.4 (SD 3.1).

There were no significant differences in clinical or ongoing/delivered pregnancy rates in the donors or the recipients as seen in Table 1. There were no differences in fresh embryo implantation rates either (Table 1).

Table 1. — Outcome following fresh and frozen embryo transfers in donors and recipients sharing eggs.

	Donors	Recipients	Donors 1 <sup>st</sup> frozen ET	Recipients 1 <sup>st</sup> frozen ET
# transfers ≥ 2 ET	118	118	32	61
# pregnancies	66	73	11	21
% pregnant/transfer	55.9	61.9	34.4	34.4
# clinical	59	67	8	19
% clinical/transfer	60.0	56.8	25.0	31.1
# chemical	5	6	2	2
# ectopic	2	0	1	0
# ongoing/delivered	54	60	7	16
% ongoing/delivered	45.8	50.8	21.9	26.2
# miscarriages	7	8	3	4
% miscarriage/clin. preg.	11.9	11.9	37.5	21.1
# ET	348	374	94	194
Average # ET	2.9	3.2	2.9	3.2
# sacs implanted	95	122	13	28
Implantation rate	27.3	32.6	13.8	14.4

There was no difference in pregnancy or implantation rates when comparing the first frozen embryo transfer (Table 1).

The mean number of fresh embryos transferred was 2.9 for donors and 3.2 for recipients.

## Discussion

These data clearly show that the uterus from women in their 40's is as receptive for implantation as in younger women

Though successful pregnancies with donor eggs have also been recorded in women > 50 this age group only represented a very small minority of the recipients [10]. Thus these data do not prove that the uterus is as effective in women ≥ age 50 but do not refute this possibility.

Uterine fibroids are known to increase in frequency in women in this age range and donors or recipients with fibroids were not excluded. The percentage of fibroids in younger donors vs older recipients was not evaluated in this study but probably was higher in the recipients. Women with fibroids were not excluded in this study and surgery was only performed for submucous fibroids. These data support but do not prove our previous conclusions that the presence of intramucosal or subserosal fibroids in donor egg recipients does not impair the implantation rates [11].

Besides the presence of hydrosalpinges in the donors the other explanation for the aforementioned study showing higher pregnancy and implantation rates in recipients vs donors in a shared program was the possibility that the controlled ovarian hyperstimulation regimen (COH) had an adverse effect on the uterine environment [2]. There are data supporting the concept that COH may adversely effect implantation [12]. In fact some anecdotal case reports support this concept, e.g., a 38-year-old woman who failed to conceive despite transferring 92 embryos over 10 IVF cycles but was successful with her first frozen embryo transfer [13]. That same woman was successful again with natural ovulation and progesterone support in the luteal phase at age 40 [14].

There are data suggesting that the risk that the controlled ovarian hyperstimulation regimen may adversely affect 20% of the women having IVF-ET [15]. Though the present study showed no significant difference in pregnancy or implantation rates in the donor vs recipients there still was a 20% higher implantation rate in fresh embryo transfer cycles in the recipients which was not present with frozen embryo transfers. Thus the present data do not refute this concept.

## References

- [1] Sauer M.V., Paulson R.J., Lobo R.A.: "Reversing the natural decline in human fertility". *JAMA*, 1992, 268, 1275.
- [2] Check J.H., O'Shaughnessy A., Lurie D., Fisher C., Adelson H.G.: "Evaluation of the mechanism for higher pregnancy rates in donor oocyte recipients by comparison of fresh with frozen embryo transfer pregnancy rates in a shared oocyte programme". *Hum. Reprod.*, 1995, 10, 3022.
- [3] Strandell A., Waldenstrom U., Nilsson L., Hamberger L.: "Hydrosalpinx reduces in vitro fertilization/embryo transfer pregnancy rate". *Hum. Reprod.*, 1994, 9, 861.
- [4] Andersen A.N., Yue Z., Meng F.J., Petersen K.: "Low implantation rate after in vitro fertilization in patients with hydrosalpinges diagnosed by ultrasonography". *Hum. Reprod.*, 1994, 9, 1935.
- [5] Vandromme J., Chasse E., Lejeune B., Van Rysselberge M., Selvigne A., Leroy F.: "Hydrosalpinges in in vitro fertilization: an unfavorable prognostic feature". *Hum. Reprod.*, 1995, 10, 576.
- [6] Shelton K.E., Butler L., Toner J.P.: "Salpingectomy improves the pregnancy rate in in vitro fertilization patients with hydrosalpinx". *Hum. Reprod.*, 1996, 11, 523.
- [7] Puttemans P.J., Rosens I.A.: "Salpingectomy improves in vitro fertilization outcome in patients with a hydrosalpinx: Blind victimization of the fallopian tube?". *Hum. Reprod.*, 1996, 11, 2079.
- [8] Andersen A.N., Linhard A., Loft A., Ziebe S., Andersen C.Y.: "The infertile patient with hydrosalpinges: IVF with or without salpingectomy?". *Hum. Reprod.*, 1996, 11, 2081.
- [9] Check J.H., Fox F., Choe J.K., Krotec J.W., Nazari A.: "Sharing of oocytes from infertile versus paid donors results in similar pregnancy and implantation rates". *Fertil. Steril.*, 2004, 81, 703.
- [10] Check J.H., Nowroozi K., Barnea E.R., Shaw K.J., Sauer M.V.: "Successful delivery after age 50: a report of two cases as a result of oocyte donation". *Obstet. Gynecol.*, 1993, 81, 835.
- [11] Dietterich C., Check J.H., Choe J.K., Nazari A., Fox F.: "The presence of small uterine fibroids not distorting the endometrial cavity does not adversely affect conception outcome following embryo transfer in older recipients". *Clin. Exp. Obstet. Gynecol.*, 2000, 27, 168.
- [12] Check J.H., Choe J.K., Katsoff D., Summers-Chase D., Wilson C.: "Controlled ovarian hyperstimulation adversely affect implantation following in vitro fertilization-embryo transfer". *J. Assist. Reprod. Genet.*, 1999, 16, 416.
- [13] Check J.H., Choe J.K., Nazari A., Summers-Chase D.: "Ovarian hyperstimulation can reduce uterine receptivity. A case report". *Clin. Exp. Obstet. Gynecol.*, 2000, 27, 89.
- [14] Check J.H., Check M.L.: "A case report demonstrating that follicle maturing drugs may create an adverse uterine environment even when not used for controlled ovarian hyperstimulation". *Clin. Exp. Obstet. Gynecol.*, 2001, 28, 217.
- [15] Check J.H., Nazari P., Check M.L., Szekeres-Bartho J., Yuan W.: "Evidence that the adverse effect of controlled ovarian hyperstimulation on successful pregnancy outcome following embryo transfer may be related to premature trophoblast invasion". *Clin. Exp. Obstet. Gynecol.*, 2002, 29, 83.

Address reprint requests to:  
J.H. CHECK, M.D., Ph.D.  
7447 Old York Road  
Melrose Park, PA 19027 (USA)