

# OPINION

## Semen donor recruitment in an oocyte donation programme

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**The article presents a new system for the recruitment of gamete donors. The system is a partial application of the mirror exchange system: the male partner of a couple donates sperm, and in return, he receives the guarantee that his partner benefits from a greatly reduced waiting time for donor oocytes. More specifically, the woman will obtain donor oocytes within a period of 8 months. The procedure was very successful in recruiting sperm donors while avoiding the ethical objections raised against other incentives to attract donors. The data indicate that the system would also work to encourage IVF patients to share their oocytes.**

*Key words:* oocyte sharing/ethics/gamete donation/mirror donation/reciprocity

### Introduction

Because of several factors, it becomes increasingly difficult to recruit gamete donors. More stringent screening for sexually transmitted diseases and higher semen quality standards affect the number of candidate semen donors that are released (Paul *et al.*, 2006). More recently, the removal of donor anonymity has caused a significant decrease in the number of candidates that apply as donors (Pennings, 2001; Janssens *et al.*, 2006). Although the alterations to the procedure mentioned above lead to a reduction of the number of donors available, few new strategies are proposed to recruit more gamete donors. However, new systems should not only attract more donors; they should do so without violating ethical standards like the prohibition of payment. We believe that it is important that attempts made by clinics all over the world to recruit gamete donors should be published to avoid the loss of successful procedures. Given the increasing shortage of gamete donors, creative designs are urgently needed. In this article, we present a system which constitutes a variant of the mirror exchange system. The system was in place from 2001 to March 2004, when the restrictive Italian law 40/2004 'Norms on the matter of medically assisted reproduction' prohibited all forms of gamete donation (Benagiano and Gianaroli, 2004).

### Oocyte donation programme

#### Donors

The regulation that was applicable during the recruitment period stipulated that only women undergoing infertility treatment could be oocyte donors (Ministry of Health, 1997).

The criteria for selection were age <36 years, normal karyotype, negative for infectious diseases and negative family history for inherited disorders. The general rule was that a maximum of four oocytes were used for donation when >10 mature oocytes had been collected. In addition, in case of previous failures and severe male factor, there had to be at least 13 oocytes available before donation was considered. To make sure that the decisions made by the medical staff did not affect the donor's cycle outcome, an yearly retrospective analysis of the data was made. Table I summarizes the results for donors and non-donors accumulated over the last 10 years.

This system maintains a high safety margin to ensure that donors do not suffer any harm as a consequence of their decision. This high threshold before sharing was considered justified by the fact that these women did not receive any benefit for their helping act. Other systems could be considered, which allow the allocation of more oocytes to the recipients without reducing the success rate in donors but with an increase in pregnancy rate in recipients. One could for instance allow oocyte sharing when at least eight oocytes are retrieved, which are then randomly and equally distributed between donors and recipients, or one could start the oocyte sharing procedure from 12 oocytes and allocate all oocytes above eight to the recipients (Kolibianakis *et al.*, 2003).

Donation was made entirely on a voluntary basis and without any financial benefit. Between 35 and 40% of the women accepted to share oocytes, and this percentage remained stable over the years. Remarkably, about 80% of the women who were part of a couple that needed donor sperm accepted to donate oocytes.

**Table I.** Clinical outcome of donor and non-donor cycles

	Donors	Non-donors
Number of cycles	619	1159
Age (mean $\pm$ SD)	31.8 $\pm$ 2.4	31.1 $\pm$ 2.8
Number of oocytes/recovery (mean $\pm$ SD)	17.3 $\pm$ 3.2	16.2 $\pm$ 7.5
Number of transferred cycles	573	1013
Number of clinical pregnancies (%)	206 (36)	346 (34)
Number of abortions (%)	19 (9.2)	47 (13.5)
Percentage of cycles with cryopreservation of surplus embryos	47	26

### Recipients

Couples could be accepted into the programme only after physical and psychological evaluation. The female's age limit was fixed at 50. When all criteria to enter the programme were fulfilled, the male partner's semen was cryopreserved, and the couple entered the waiting list. When oocytes were available for donation, they were inseminated using the cryopreserved semen of the recipient's partner, and all 2 pronuclei (PN) embryos were frozen. The couple was contacted to repeat the serological exams and to start the hormone replacement therapy for the embryo transfer.

According to our policy, the costs for the recipient were calculated on the basis of a full IVF cycle minus all the expenses for drug administration, monitoring and oocyte retrieval procedure. This operational concept brought the cost of an oocyte donation cycle down to less than half the cost of a normal fresh IVF/ICSI cycle.

### Waiting list

Until 1997, the mean waiting time for donor oocytes lasted approximately 6–8 months. After 1997, the list became gradually longer. By 2000, the average waiting time had increased to >2 years. This prolongation was due to several factors. On the supply side, several potential oocyte donors had decreased because of the more advanced age of the women entering IVF treatment and because of the new offer of preimplantation genetic diagnosis (PGD) for aneuploidy to patients according to clinical indications (Gianaroli *et al.*, 1997) or as a tool for prognosis (Ferraretti *et al.*, 2004). On the demand side, increased oocyte donation requests from pre-menopausal women. In addition, because of our experience, several small IVF centres from every part of Italy, who were unable to organize oocyte donation programmes, referred their patients to the S.I.S.Me.R. Centre.

### Semen donation programme

Donors had been recruited for years from the general population, mainly among university students and hospital personnel. Semen had to be donated on an altruistic basis. Only a minimal compensation was allowed for the reimbursement of expenses. The procedure included a preliminary evaluation of the genetic and infectious risks, specific counselling, semen storage for 6 months, repetition of the tests and utilization of the previous cryopreserved semen samples. Recruitment and turnover of donors have always been very difficult for several reasons: first, no payment was allowed, second, some men (20–25% of

donors) did not return for the second set of analyses after 6 months of quarantine and, finally, the donor would be dismissed after five pregnancies (at least two donors every year). Approximately 10 sperm donors were accepted per year.

In 2001, we decided to start a new system of recruitment of semen donors. The couples waiting for oocyte donation were approached with the following proposal: if the male partner accepted to donate sperm, the female partner would have the guarantee that she would receive donor oocytes within 8 months. This meant a considerable reduction of the expected waiting time. Because the sperm quality was known from previous examinations, only couples of which the male partner had normal sperm were approached. This system had several advantages:

- (i) no need for expensive recruitment campaigns outside the centre;
- (ii) availability of a large, heterogeneous population including young and fertile men;
- (iii) the population that was approached had already faced and thought through the problems related to gamete donation and was thus well prepared for the social and psychological ramifications;
- (iv) good geographic distribution over Italy;
- (v) the men had already been screened for genetic and infectious diseases to be accepted in the oocyte donation programme;
- (vi) the semen cryopreservation was included in the oocyte donation procedure;
- (vii) a population that was eager to collaborate and ready to repeat the examinations for sexually transmitted diseases before each embryo transfer.

The age limit for sperm donors was put at 42 years. Both partners had to sign the consent form for semen donation. The procedure was discussed with the local Ethics Committee, which approved the 'exchange' system. The new recruitment method started in June 2001. The results exceeded our expectations; 60% of the male partners accepted to donate semen. At the time of semen cryopreservation, half of the sample was stored for the semen donation programme, half for their own use. Six to eight months later, the couple received oocytes for insemination that had been cryopreserved at the 2PN stage. The couple was then asked to repeat the laboratory screening tests to programme the thawed transfer. When the test results were normal, the sample stored for donation was transferred to the sperm bank. At the time of the embryo transfer, a new semen sample was asked for a new storage.

In 1 year, without additional effort, we were able to recruit 30 new sperm donors. The recruitment was then stopped to be able to perform the donation cycles of the female partners within the promised time. As soon as this was the case, the recruitment was reopened and so on. Unfortunately, in March 2004, the Law forced the centre to close both gamete donation programmes. At that time, we had 180 straws ready for use and 354 straws in storage that had to be discarded.

### Discussion

The present system is a partial application of the mirror gamete donation system: the male partner of the couple donates sperm,

so that his partner benefits from a strongly reduced waiting time for donor oocytes (Pennings, 2005). This system is based on the principle of fairness; people who voluntarily accept to benefit from a system should make a contribution to that system. The couples who contribute receive in return a reduction in waiting time by taking priority on the waiting list. This non-monetary benefit avoids most objections against payment for gametes. In summary, the system has three important advantages: it increases the number of gamete donors, it avoids the introduction of payment as an incentive and it allows people to pay back their 'debt' by reciprocating.

In the system presented here, the exchange was asymmetrical: the men donate semen in exchange for priority for their partners to receive oocytes but not vice versa. There was no need to ask female partners to donate oocytes in return for sperm, because there was no waiting list for donor sperm. However, it would have been possible to apply the system simultaneously to recruit oocyte donors within a sperm donation programme, even if only IVF patients are eligible as oocyte donors. Women who need IVF could be asked to donate oocytes in exchange for a reduction in waiting time for sperm. The percentage of women among our patients prepared to share oocytes when they needed donor sperm was almost double the number of those who used their own genetic material. This suggests that the patients themselves felt the need to reciprocate.

Several female patients who were prepared to share their oocytes without any advantage for themselves was very high. It is difficult to compare the results with the international experience, because the whole context of donation and treatment differs considerably. In most countries where oocyte sharing takes place, the donors receive a complete or partial IVF cycle in return. However, even with this benefit, the percentage of women who accept to share oocytes is (much) lower than the 35–40% that was found in our centre. It is difficult to speculate on the factors responsible for the high compliance rate. One possibility is the simple fact that the women were asked to donate. It is known from the context of organ donation that just asking may in itself increase the donation rate. Some gynaecologists are convinced that women will not donate and consequently do not even bother to ask. Another characteristic of the donation procedure in our centre was that the donors were informed when signing the consent form that they would not be told whether or not oocytes had been taken for donation. They were only told how many oocytes were available for themselves, not how many there had been in total. The absence of information makes the donation more abstract and hypothetical, because the donation is merely a possibility and not a certainty for the women who accepted to share. In fact, in >60% of cases where women agreed to share, no oocytes were used for donation, because the conditions were not fulfilled. The rule that no information on the outcome should be provided to the donors was, and still is, adopted in many centres. Sperm and oocyte donors are not told whether children are born from their donation, even though many would have liked this information (Cook *et al.*, 1995; Söderström-Anttila, 1995). The UK Human Fertilisation and Embryology Authority (HFEA) in its guidance for oocyte-sharing arrangements states that 'neither

the oocyte provider nor the oocyte recipient(s) will be made aware of the outcome of the other's treatment' (HFEA, 2005). The main reason for withholding this information was to avoid disappointment if the donor fails to conceive and the recipient succeeds (HFEA, 2005). Our centre went one step further and also did not inform the candidate donors about whether a donation had taken place. The main reason for not telling was to avoid negative feelings of the donor who could feel disappointed and guilty, because she had let down another woman (Blyth, 2004). The absence of information about the use of oocytes for donation did not seem to cause concern, as very few women (at most 10 women during the 10-year period) asked for this information after the oocyte recovery. This finding contradicts the results of other studies, in which most of the oocyte sharers wanted information on the outcome of the recipients' treatment and/or on the recipients themselves (Blyth, 2004). However, the results are not consistently pointing in the same direction. In the study by Ahuja *et al.* (1998), only 8% of the oocyte sharers wanted to know whether the recipient became pregnant. Finally, the sharing system had a high threshold for donation; there had to be at least 10 mature oocytes before oocytes were taken for donation, and even then, a maximum of four was destined for donation. This threshold may have reassured the potential donors that the donation would not negatively affect their chances of success.

#### *Possible dangers of the system*

It has been argued that the possibility that the donor couple would not become pregnant while the recipient couple does may cause psychological harm. This may indeed be the case, but empirical evidence for this statement is scarce. In fact, oocyte sharers give mixed answers when considering this question (Ahuja *et al.*, 1998). Some women were happy that at least some good came of their treatment. The issue can be easily avoided by not informing the donor about the outcome of her contribution or by adopting a more individualized system, in which the participants themselves can decide whether they want this information.

Restricting donation to IVF patients has the important advantage that the women undergo the hormonal stimulation and oocyte recovery for themselves. This almost completely removes the asymmetry in effort between oocyte and sperm donation. This asymmetry, i.e. the male partner has to make a much smaller effort to obtain an advantage for his partner than the female partner for her partner, is considered an important objection against the mirror exchange system. The only possible disadvantage for the donor in our system would be a reduction of her own chances of success, but this was not confirmed neither by the data in our centre nor by the findings in other studies (Thum *et al.*, 2003).

The recruitment of IVF patients as oocyte donors is a perfectly acceptable procedure if no financial remuneration is offered. The whole discussion on oocyte sharing is focussed on the question whether the partial or full IVF cycle donors receive in return should be considered as payment (Ahuja *et al.*, 1998). Whatever one's position on that point, there are strong indications that this benefit has a strong influence on the

women's decisions and may tip the balance for women who are reluctant to donate (Rapport, 2003; Blyth, 2004; Pennings and Devroey, in press).

Finally, some people might question the voluntariness of the donation in this system. They could argue that when the waiting list becomes very long, candidate recipients have no choice but to donate. We find it highly unlikely that a reduction of the waiting time from ~2 years to 8 months constitutes a form of pressure that leaves no choice to couples who really object to donation. In fact, this benefit is much smaller than the usual benefit for oocyte sharing, i.e. the price of a full or partial IVF cycle. In the latter case, one might rightly wonder whether this benefit constitutes an inducement that may jeopardise the validity of the informed consent of the donor. However, the HFEA reasoned that if the oocyte sharers' judgement were really obscured by the promise of free treatment, one might expect to find evidence of people complaining about this afterwards or at least that some oocyte providers later regret giving up their oocytes (HFEA, 2005). If free treatment does not threaten voluntariness, then faster treatment certainly will not have this effect. The waiting time reduction is an incentive to promote reciprocity and solidarity among fellow patients who are suffering from the same complaint (Shenfield and Steele, 1995). We see no reason why people who help others, like others helped them, should not be rewarded if the reward does not infringe other ethical rules.

## Conclusions

The mirror exchange system is successful in recruiting sperm donors. A reduction of waiting time for oocytes or the guarantee to receive donor oocytes within a fixed period is a benefit that motivates the male partners in couples needing oocytes to become sperm donors. A similar benefit could be introduced to recruit oocyte donors, especially when only IVF patients are eligible as oocyte donors.

## References

- Ahuja KK, Simons EG, Mostyn BJ and Bowen-Simpkins P (1998) An assessment of the motives and morals of egg share donors: policy of 'payments' to egg donors requires a fair review. *Hum Reprod* 13,2671–2678.
- Benagiano G and Gianaroli L (2004) The new Italian IVF legislation. *Reprod Biomed Online* 9,117–125.
- Blyth E (2004) Patient experiences of an 'egg sharing' programme. *Hum Fertil* 7,157–162.
- Cook R, Golombok S, Bish A and Murray C (1995) Disclosure of donor insemination: parental attitudes. *Am J Orthopsych* 65,549–559.
- Ferraretti AP, Magli MC, Kopcow L and Gianaroli L (2004) Prognostic role of preimplantation genetic diagnosis for aneuploidy in ART outcome. *Hum Reprod* 19,694–699.
- Gianaroli L, Magli MC, Ferraretti AP, Fiorentino A and Munnè S (1997) Pre-implantation genetic diagnosis increases the implantation rate in human IVF by avoiding the transfer of chromosomally abnormal embryos. *Fertil Steril* 68,1128–1131.
- HFEA (2005) *SEED Report*. HFEA, London.
- Janssens PMW, Simons AHM, van Kooij RJ, Blokzijl E and Dunselman GAJ (2006) A new Dutch law regulating provision of identifying information of donors to offspring: background, content and impact. *Hum Reprod* 21,852–856.
- Kolibianakis EM, Tournaye H, Osmanagaoglu K, Camus M, Van Waesberghe L, Van Steirteghem A and Devroey P (2003) Outcome for donors and recipients in two egg-sharing policies. *Fertil Steril* 79,69–73.
- Ministry of Health (1997) Prohibition of commercialisation and advertising of human gametes and embryos. Ordinance of 5 March 1997.
- Paul S, Harbottle S and Steward JA (2006) Recruitment of sperm donors: the Newcastle-upon-Tyne experience 1994–2003. *Hum Reprod* 21,150–158.
- Pennings G (2001) The reduction of sperm donor candidates due to the abolition of the anonymity rule: analysis of an argument. *J Assist Reprod Genet* 18,617–622.
- Pennings G (2005) Gamete donation in a system of need-adjusted reciprocity. *Hum Reprod* 20,2990–2993.
- Pennings G and Devroey P (in press) Subsidised IVF treatment and the effect on the number of egg sharers. *Reprod Biomed Online*.
- Rapport F (2003) Exploring the beliefs and experiences of potential egg share donors. *J Adv Nurs* 43,28–42.
- Shenfield F and Steele SJ (1995) A gift is a gift is a gift, or why gamete donors should not be paid. *Hum Reprod* 10,253–255.
- Söderström-Anttila V (1995) Follow-up study of Finnish volunteer oocyte donors concerning their attitudes to oocyte donation. *Hum Reprod* 10,3073–3076.
- Thum MY, Gafar A, Wren M, Faris R, Ogunyemi B, Korea L, Scott L and Abdalla HI (2003) Does egg-sharing compromise the chance of donors or recipients achieving a live birth? *Hum Reprod* 18,2363–2367.