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Sperm and oocyte donor selection and management: experience of a 10 year follow-up of more than 2100 candidates

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BACKGROUND: The main concerns for couples undergoing assisted reproduction treatment using donor gametes are the possibilities of acquiring infectious diseases and of transmitting genetic disorders to the progeny. They are also frequently concerned and interested in the cultural and psychological background of the donors. Our aim was to examine the current prevalence of genetic alterations and infectious diseases in our sperm and oocyte donor population, and to review our experience in the management of donors and candidates during the last 10 years. METHODS AND RESULTS: Routine blood analyses, semen and vaginal cultures together with complete medical, psychological and genetic histories were examined retrospectively. Our results clearly show that the frequency of sexually transmitted diseases and genetic disorders is comparable with both the frequency present in the population requiring infertility treatments and the general population. CONCLUSIONS: The screening procedure applied to all the candidates sufficiently minimizes any risk to the gamete receiver and the offspring.

Key words: oocyte donors/sexually transmitted diseases/sperm donors

Introduction

A common concern to patients undergoing assisted reproduction treatments with sperm or oocytes from a donor is the question of the guarantee offered by the methods used by the clinics in the screening and selection of candidates who are to donate their gametes.

Based on the analysis of the population of patients at our clinic, the people who require donor sperm are the following: patients with secretory azoospermia, patients with transmissible genetic diseases, HIV seropositive males with a serodiscordant partner wishing to avoid any viral transmission (although in some institutions, including ours, we have the possibility of performing semen washes and IVF in serodiscordant couples), those who cannot afford expensive IVF treatments but have a need for assisted reproduction technology due to a severe factor in the male, and finally single women desiring pregnancy (Meseguer *et al*., 2002).

On the other hand, oophorectomized women, women with premature ovarian failure, in menopause, and carriers of hereditary diseases are the candidates for the reception of donor oocytes (Remohí *et al*. 1997). In addition, repeated failures of IVF can be another reason to substitute parental gametes with fertile donor's gametes.

The main concerns in the recipients of donor gametes are the risk of infection with a sexually transmitted disease (STD), the transmission of hereditary disorders, and, finally, the cultural and psychological background of the donors.

Although the demand for donor gametes has increased in the last 10 years for recipients of oocytes, since the advent of ICSI, which overcomes the most severe male factors (except for total azoospermia), the need for sperm donation has decreased (Human Fertilisation and Embryology Authority, 2001). In Spain, the assisted reproduction law dates from 1988 (Boletín Oficial del Estado, 1988). It requires periodical tests, with slight differences between males and females (Table I).

For semen samples, the most important requirement is that before the donation, the ejaculates should be kept frozen for a period of $\geqslant$6 months, after which the serological tests should be repeated; only if no seroconversion is detected may the semen be used. Due to the impossibility of freezing oocytes at the time when the law was enacted, as well as to the low efficiency of the procedure, we presently find that a negative blood analysis close to the follicular aspiration time in these women is considered sufficient for the donation of their ova.

These analyses and controls are often expensive and greatly complicate donor management. Moreover, since very few articles and books considering these topics are currently available in the literature (Englert *et al*., 1998; Marina *et al*.,

Table I. Spanish assisted reproduction law obliged serologies for semen and oocyte donors (Boletín Oficial del Estado, 1988)

Gamete donor serologies	
Males	Females
Blood type and Rh	Blood type and Rh
Human immunodeficency virus	Human immunodeficency virus
Syphilis	Syphilis
Hepatitis B virus	Hepatitis B virus
Hepatitis C virus	Hepatitis C virus
Herpes simplex virus	Herpes simplex virus
Cytomegalovirus	Cytomegalovirus
Microbiological semen cultures (*Chlamydia trachomatis* and *Neisseria gonorrhoeae*)	Microbiological vaginal cultures
Karyotype[a]	Karyotype[a]

[a]Not required.

1999), a careful analysis of the situation is mandatory. Our aim was to retrospectively assess the incidence and magnitude of infectious diseases and genetic disorders in our population of semen and oocyte donors, as well as the results of our screening methods, and describing their psychological and social backgrounds.

Materials and methods

Donor selection

We studied retrospectively the results of all the complete medical and genetic histories and serological/microbiological tests done in our population of semen and oocyte donors in the period from January 1991 to September 2001.

The potential gamete donors were recruited from young (<35 years old) volunteers interested in our programmes. The most frequent way to recruit donors was by way of another donor's recommendation, although some campaigns in universities and sports areas have been carried out. These donors presumably had no other motivation to donate their gametes other than merely altruistic reasons. The minimal economic compensations are explained later, and due to the low compensation in comparison with all the requirements and annoyances endured, it is unthinkable that these compensations can be considered as a salary or payment.

Professional confidentiality with regard to the identities of gamete donors and recipients was maintained according to the dictates of Spanish Assisted Reproduction Law (SARL). During the selection, a personal and family medical and genetic history form was completed (as detailed in SARL) with the aim of discarding potentially inheritable disorders. Also, genital exploration, periodic analyses to detect infectious diseases and a complete karyotype (made common in the last few years) were carried out.

Karyotype has been studied in the donors to guarantee as far as possible the absence of genetic disorders caused by chromosomal abnormalities. Although it is not demanded by Spanish law, we believe that it increases the safety of our programme. We only accept donor samples which have $>90\times10^6$ of total motile progressive sperm in the ejaculate, and a morphology >14% of normal forms (strict criteria).

Finally, tests on post-thawing survival in the sperm donors were performed before their acceptance. A total of $>10\times10^6$ of progressive forms per ml was considered acceptable.

Moreover, phenotypic characteristics of each donor were recorded, such as height, weight, ethnic origin, colour of skin, eyes and hair, hair texture, blood type, etc. These characteristics were studied in order to match them with those of the recipient couple, since the responsibility of selecting the ideal donor is entrusted to the laboratory.

Before becoming donors, all of them were fully informed and gave signed consent for the use of their gametes, as stated in the SARL.

Blood tests included periodic batteries for: surface antigen for hepatitis B (HBV), anti human immunodeficiency virus (HIV)-1 and -2, anti-hepatitis C virus (HCV), anti-herpes simplex virus (HSV)-1 and -2, anti-syphilis, anti-*Chlamydia* and anti-cytomegalovirus (CMV) antibodies (Table I). Moreover, in the women included in this programme, the presence of antigen-antibodies HIV (DUO) and antibodies against *Rubella* and *Toxoplasma* was also determined. Microbiological cultures were performed to discard the presence of *Neisseria gonorrhoea*, *Chlamydia trachomatis*, *Ureaplasma urealyticum* and *Mycoplasma hominis*.

Any positive results obtained in the above mentioned blood tests led directly to the termination of donations (except in *Chlamydia* and *Ureaplasma* positives in which cases the donors were treated) in each situation, except for positive microbiological cultures with irrelevant micro-organisms not considered as causing STD. In those circumstances, antibiograms were performed to determine the sensitivity of the colonies observed, in an effort to select the most effective treatment with antibiotics.

Donor determinations

In the last 10 years, a total of 1991 oocyte donors were included, with a mean age of 25.5 years (range 18–35). A total of 1572 determinations was made of the following agents: anti-HIV-1 and -2, anti-HBV, anti-HCV, anti *Toxoplasma* IgM, anti-*Rubella* IgM, anti-*Chlamydia* IgM, anti-HSV-1 and -2 IgM antibodies, syphilis detection [with either RPR (rapid plasma regain) fast detection or VDRL (Venereal Diseases Research Laboratory)], anti-CMV IgM antibodies, blood types and Rh group. Only 180 antigen-antibodies HIV DUO (recently included in our centre), 563 karyotypes, and 445 vaginal exudate microbiological cultures were carried out.

The remaining women who were not serologically tested abandoned our programme or were excluded for different reasons before the donation.

We performed antigen/antibody (HIV DUO) testing in the female donors to shorten the non-detectable period for HIV to 2 weeks. Spanish law claims that only an analysis discarding the presence of viral particles by antibody testing is sufficient since oocytes cannot be frozen as stated in SARL.

With sperm donors, the situation is different: we must maintain frozen each sample (⩾6 months), and we need a second serology after this period showing no seroconversion. Recent laboratory protocols permit a reduction of these 6 months to just 2 weeks, but the law is very restrictive, and we cannot use the samples for ⩾6 months after this period.

The 167 male donors during this period had been with us for a mean time of 2 years, with a mean age of 21.9 years (range 18–35). A total of 571 serum analyses (3.4 analyses/donor) for every blood test mentioned above was performed, as well as 627 (mean 3.8 analyses/donor) semen cultures.

All the methodological details for serum determinations are summarized in Table II.

In semen, the antigen of *Chlamydia* was investigated with fluorescent enzyme-linked immunosorbent assay (VIDAS analyser with VIDAS Chlamydia CHL; Biomérieux, Marcy-l'Etoile, France). In the positive cases, a neutralizing assay was performed by using the Biomérieux Blocking Assay (VIDAS CHB, Marcy-l'Etoile, France).

Table II. Summary of the serological tests used

Determinations	Techniques and kits	Laboratories
Techniques employed for STD detection		
HIV-1 and -2 antibodies		
Anti-HBV	IMX and AXSYM with MEIA technology	Abbot Laboratories (Madrid, Spain)
Anti-HCV	IMX and AXSYM with MEIA technology	Abbot Laboratories (Madrid, Spain)
Anti-*Toxoplasma* IgM,	IMX and AXSYM with MEIA technology	Abbot Laboratories (Madrid, Spain)
Anti-CMV IgM	IMX and AXSYM with MEIA technology	Abbot Laboratories (Madrid, Spain)
Anti-*Rubella* IgM	IMX and AXSYM with MEIA technology	Abbot Laboratories (Madrid, Spain)
Antigen antibodies HIV	HIV DUO	Abbot Laboratories (Madrid, Spain)
Chlamydia IgM	Indirect immunofluorescence (IFI), the Chlamydia Trach spot, after absorption with anti-IgG	Biomerieux (Marcy L'Etoile, France) and Dadebehring, (Marburg, Germany) respectively
Anti HSV-1 and -2	Enzyme-linked immunoassay (ELISA): Eti-hsvk G1/2, Eti-hsvk G2, and Eti-hsvk M 1/2, for IgG and M respectively	Diasorin (Saluggia, Italy)
Syphilis detection	Plasmatic reagins fast detection (RPR) or VDRL (Venereal Diseases Research Laboratory)	Biomérieux (Marcy-l'Etoile, France)
Karyotypes	GTG banding	
Positive results confirmative techniques		
HIV-1 and -2 antibodies	Western blot from HIV-1 plus surface antigen for HBV	Bioblot Laboratories (Lissà d'Amunt, Spain);
HBV	(HbsB-Ag Australia) with fluorescence ELISA VIDAS	(Immunogenetics Ghent, Belgium);
Anti-HCV	HBs Ag, with immunoblot Innolia HCV III with fluorescence ELISA,	Biomérieux (Marcy-l'Etoile, France)
Anti-*Toxoplasma* IgM	VIDAS Toxo IgG II, VIDAS Toxo IgM	Biomérieux Marcy-l'Etoile, France
Anti-*Rubella* IgM	Fluorescence ELISA VIDAS RUB IgG II, VIDAS RUB IgM	(Biomérieux, Marcy-l'Etoile, France)
Syphilis detection	Syphilis with indirect immunofluorescence FTA IgG/IgM,	(Biomérieux, Marcy-l'Etoile, France)

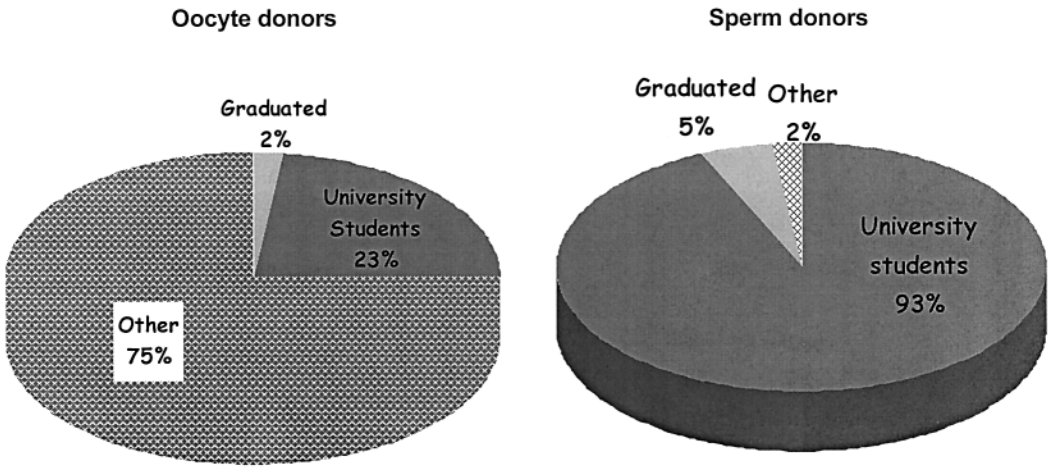

Figure 1. Graphic presentation of cultural background of sperm and oocyte donors. The percentage of each of the categories is represented.

Results

Oocyte donors

In the last 10 years, a total of 1991 oocyte donors were included. A study of the cultural background of this population revealed that 23% were university students, while only 2% already had their degree at the moment of the ovum donation. The remainder had different kinds of backgrounds. Interestingly, 14% were housewives (Figure 1).

Of the 1991 young women that were studied as oocyte donors, 1175 (59%) were initially accepted after all the tests were performed, 816 were not accepted for several reasons, including the risk of ovarian hyperstimulation, low response, hereditary diseases, abnormal karyotype, age, infectious diseases, etc., some of which are described later. The oocyte donors performed a total of 2620 donations with a mean of 2.23 donations per donor.

During the selection, from the complete personal and familiy medical and genetic history with the aim of discarding potentially inheritable disorders, we observed only one case of each of the following disorders: malignant myopia, neurofibromatosis, left ear atrophy, congenital cataract, strabismus and leporine lip.

Of the 563 karyotypes performed, eight were pathologic (1.4%) and 10 had abnormalities that were considered irrelevant (Table III).

A total of 14 328 tests of infectious diseases were performed of which only 686 (4.7%) were positive and basically consisted of HSV positivity. The summary of the different tests performed and their incidence are described in Table IV. Apart from the

Table III. Pathological abnormalities observed in the 563 karyotypes performed on oocyte and sperm donors

Oocyte donors	Sperm donors
46,XX,inv(14)(q24,1;q32,11)	None
47,XXX	
46,XX,9 ph	
46,XX INPER (8)	
46,XX,t(1;19);(p34,3;q13.1)	
46,XX.inv(9)(p11;q21.2)	
46,XX.inv(9)(p11;q21.2)	
45,XX,+der(14;21)	
45,X(4)/46,XX(46)	

Table IV. Summary of blood test screening for sexually transmitted diseases performed on 1991 oocyte donors and 167 sperm donors included in our study and its incidence

Blood tests	Positives/total sperm donors (%)	Positives/total oocyte donors (%)
HIV-1 and -2	0/571 (0)	2/1572 (0.13)
HIV DUO (AgAb)	–	0/180 (0)
Chlamydia	0/571 (0)	8/1572 (0.51)
Toxoplasma	–	12/1572 (0.76)
Hepatitis C	1/571 (0.18)	8/1572 (0.51)
Hepatitis B	5/571 (0.88)	6/1572 (0.38)
Syphilis	0/571 (0)	2/1572 (0.12)
Cytomegalovirus	4/571 (0.70)	15/1572 (0.95)
Herpes virus type I–II	5/571 (0.88)	628/1572 (39.9)
Rubella	–	5/1572 (0.32)

positivity for HSV test, a relatively low incidence of major sexually transmitted or teratogenic diseases was observed: always $<1\%$. Sixteen (1%) women were rejected because the results of the blood tests were as follows: in two cases (0.13%) antibodies of HIV were positive, eight cases (0.51%) were positive for HCV, and six cases (0.38%) were positive for HBV. From a total of 628 herpes positive cases (40%), 267 were type II (genital form) but active infection (clinically affected) (herpes type II IgM) was seen only in 10 cases (0.6%).

The cultures of the vaginal secretion were positive in 103 out of 445 cases (23.1%); the different micro-organisms found are detailed in Figure 2. *Candida albicans* was the most frequent. No candidates were rejected because of their culture results. All patients who had a positive culture received appropriate treatment.

Sperm donors

Only 167 young men were accepted as sperm donors from more than 800 candidates. The remaining candidates were rejected mainly due to low seminal quality, or repeated low motility after thawing. From the 167 donors studied, the vast majority were university students (93.3%), while only 4.8% had finished their studies and 1.9% were working (Figure 1).

We observed a low frequency of infections. We did not have any case of HIV or syphilis at all, and only one of HCV, which represents a very low incidence. Occasionally we found HBV, cytomegalovirus and herpes. Results are summarized in Figure 2.

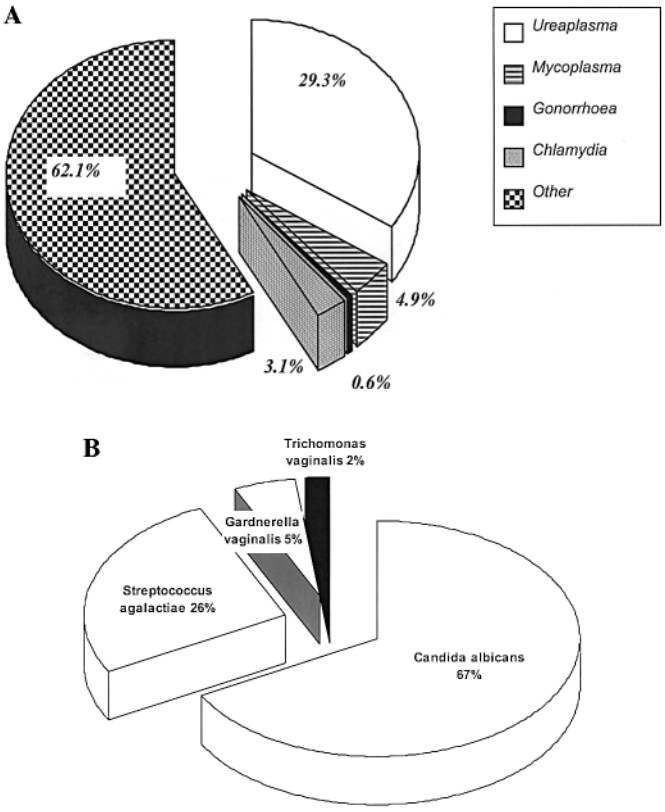

Figure 2. Circle diagram representing the incidence of the various micro-organisms found in the cultures from semen samples (**A**) and vaginal flux (**B**) performed in our oocyte donors.

In relation to semen cultures, a relatively high incidence of semen infections was seen, most of them being irrelevant (16%), because they are not considered as STD, such as *Enterobacter*, *Klebsiella*, *Haemophilus*, *Proteus* or *Staphylococcus*. The sporadic incidence of *Chlamydia* infections in donors was similar to that found in the general population and higher than that of *Neisseria gonorrhoeae* or syphilis in our donors. Results are shown in Table IV.

No karyotype abnormalities were found in the donor candidates and only two cases of inheritable disorders were found, one of Steiner muscle dystrophy and one of convulsive disorders or epilepsy. Subsequently, these males were rejected as donors.

Discussion

The correct development of a programme of semen and oocyte donation requires an exhaustive control of both the clinical and the legal aspects. These aspects can be divided into two main functions. One is the control of the offspring obtained from the donors in order not to exceed the maximum recommended number of newborns (six in Spain). The second, and surely the most important, is to avoid any transmission of infectious and genetic diseases to the gamete recipients and their progeny.

To this end there are, again, two factors to be considered. First, it is important to select the candidates who donate their gametes from a low risk population for both infectious and genetic diseases (often restricted to particular ethnic groups in

the latter). Second, after the adequate selection, a strict control of blood analyses and microbiological cultures of semen and vaginal exudates should be routinely maintained.

Genetic control

In Spain, it is very difficult to find a high population of ethnic groups having genetic abnormalities that need its control (usually a very expensive procedure). Carrier status is recommended to be tested on high incidence populations, such as applicants of Jewish descent for Tay–Sachs, Canavan, and Gaucher's disease, breast and ovarian cancer (BRCA-1) mutations.

Potential donors from Asian, Middle Eastern, and Mediterranean backgrounds are tested for thalassaemia, and applicants of African descent for sickle cell anaemia and other haemoglobinopathies.

In addition, other options include testing for cystic fibrosis carriers and alpha-1 antitrypsin (mutations S and Z) carriers. All these tests can be overcome by a complete medical and genetic history, although no medical history can identify all persons at risk of transmitting a genetic disease.

Finally, all applicants should have a full karyotype analysis, which is a widely accepted option by the patients.

According to these criteria, the sperm donors displayed no abnormalities, while female donors had a low presence of karyotype anomalies. The vast majority of these, after a consultation with the geneticist, were found to be irrelevant, with a very low risk of transmission ($<$1%), but a prenatal diagnosis was recommended in these women for their own offspring. Subsequently they were rejected as donors. Only four of them were important, including a 47,XXX case, and two cases of balanced translocations with an estimated risk of transmission of ~10–20% (Table III).

Infectious diseases control

Although no ethnic origin can prevent the transmission of infectious diseases, a good educational background including extensive sex education would reduce the incidence of STD. This is one of the reasons for selecting the donors among a student population based on assumptions that people with better knowledge of the risks of unprotected sex would be less prone to acquiring STD.

Based on our findings, the donor population, both for oocyte and sperm, carries no higher risk for the general population in terms of transmitting sexually acquired infections or genetic diseases, which is a point that must be emphasized to the recipient couples. The patients must have no doubts whatsoever after having had explained to them all the tests that potential donors must pass.

In our results we demonstrate that we achieved our aim of detecting STD among the gamete donor population. However, the lack of report of transmission does not mean that no transmission at all occurred. Also, up to now, no new infection acquired by a gamete recipient in our centre (if any) has been thought to be caused by the use of donated sperm or ova. There has never been any report in our centre of an actual transmission of STD by donated sperm or oocytes in the whole period studied, although no follow-up for STD was done.

The total numbers of positive blood tests were 10 and 52 for men and women respectively, which gives a total positive rate of 15/457 (3.2%) and 52/14 328 (0.36%) per test, reflecting the low quantity of positive analysis in our population.

This is comparable with the rates presented within the population of patients requesting treatment for infertility in our centre, where a frequency of 0.012% in HIV positivity was found (Marí *et al*., 2001), although more recent approaches have demonstrated in 4186 analyses a frequency of 0.02% positivity for HIV, 0.8% for HBV and 1% for HCV, while no positives were found for syphilis (unpublished data). This clearly demonstrates that the population of donors does not have an increased incidence in the presence of STD.

In any case, infertile patients are not the best group to establish comparisons, since some STD can cause infertility, in which case studies on the general population can be useful for this purpose. To this end, we can compare our results with those described for the general population, and in some specific analysis on donors (Liesnard *et al*., 1998).

The HIV seroprevalence in the whole population of Belgium was established at ~0.08%, comparable with that of our male (0%) and female (0.12%) donors.

Regarding hepatitis viruses, HCV seroprevalence among blood donors in France was 0.3–0.5%, while in our semen donors it was 0% among men and 0.12% in women. Again the seroprevalence of HBV in our donors was similar to that described in the Western countries, ~0.5%.

The presence of HSV was higher in the general population (7.5%) of blood donors in the UK than what we found in our sperm or oocyte donors. With respect to CMV and *Chlamydia*, our results showed a lower incidence than reported in the general population (50% in US women, and 182 per 10^5 per year in the USA respectively). We don't know what makes our positive rates lower than other results reported regarding *Chlamydia* and CMV in our donors.

To our knowledge, this is the first study concerning the incidence of syphilis in a donor population; the incidence in the USA has been reported to be of the order of 6.3 per 10^5 per year, four times higher than in our donors.

Our results are in line with those described for donor populations regarding the presence of *Gonorrhoea* (0%), while figures are clearly lower than in the whole population of the USA where *Chlamydia* has a similar presence.

Since the donors did not declare any parenteral drug addiction or unprotected intercourse, the most probable manner to become infected with HIV or hepatitis viruses would be sexual intercourse without protection, mainly in the HIV positives. We must recognize that potential donors may answer questions on the consent form untruthfully in order to avoid their rejection as donors, including questions about their sexual behaviour and toxic habits. This is another reason justifying these repetitive controls.

Comparing the results between male and female donors, the only relevant differences were those concerning the total absence of *Chlamydia* and *Toxoplasma* in the sperm donors, versus an incidence between 5 and 8% in the ovum donors.

Nevertheless, the most surprising finding was that ~40% of all women were HSV seropositives, although they have been

in an inactive phase, since 257/267 positives were for the IgG fraction, showing that they had been in contact with the disease in the past but were not infected at the time of their donation (which results in IgM seropositive analysis), and no genital signs of viral infection was found. This is a very difficult matter to explain.

No previous result of the questionnaire was indicative of a higher risk of becoming infected by HCV or HBV. Only in one case of a female donor was a piercing suggested as the possible cause of HCV infection. This also reinforces the need for a regular screening in our population.

Semen cultures also presented a very high prevalence of positive samples (>25%) although they were collected following published instructions (World Health Organization, 1999). This has been previously corroborated in a population of infertile patients where 51% of the semen cultures were positive (Cottell *et al*., 2000).

Although many micro-organisms (100/173 positive cultures) found in the semen samples are non-pathogenic, probably due to an inadequate manner of sample recovery (*Klebsiella* spp., *Proteus* spp., *Haemophilus* spp., *Citrobacter* spp., etc.) (Cottell *et al*., 2000), a significant prevalence of potentially pathological sexually transmitted micro-organisms was also found in them (Figure 2).

Since we performed the microbiological tests in 167/627 samples, undoubtedly some positive samples for microbiological cultures must have been inadvertently used without causing any clinical consequences. Very few data are available regarding the incidence of this in the general population but, given that it is impossible to analyse every sample, and that the preparatory techniques together with the presence of wide spectrum antibiotics in the media used for IVF should eliminate these micro-organisms|even reducing their presence by 95% (Steyaert *et al*., 2000)|this frequency of analysis (bimonthly) in the donors should, we believe, be safe enough.

Moreover, a high incidence of positive samples, >50% for semen cultures, has been previously reported in patients undergoing IVF cycles, suggesting, as in the donor samples, that positive samples for semen cultures were not tested, but were used without deleterious effects (Cottell, 2000).

Sperm and oocyte donation: population differences

There are some reasons which explain why we have had ~10-fold more oocytes than sperm donors in the last 10 years. First, pregnancy rates are much higher in our oocyte donation programme (~50% per cycle) when compared with our artificial insemination with donor sperm programme (~25% per cycle), and the vast majority of donor semen samples are directed at artificial insemination. Also, multiple pregnancies are more frequent in the former. Hence, it is easier to reach the maximum of six newborns allowed by the current legislation in the donor oocyte group, than with sperm donors.

Moreover, our centre has had a very active programme for oocyte donation. It is a reference centre for many infertility clinics around Spain and the whole of Europe. Many patients are referred to our facilities to have these treatments. On the other hand, there are many semen banks in the same area that are able to offer similar services, and then the sperm donors

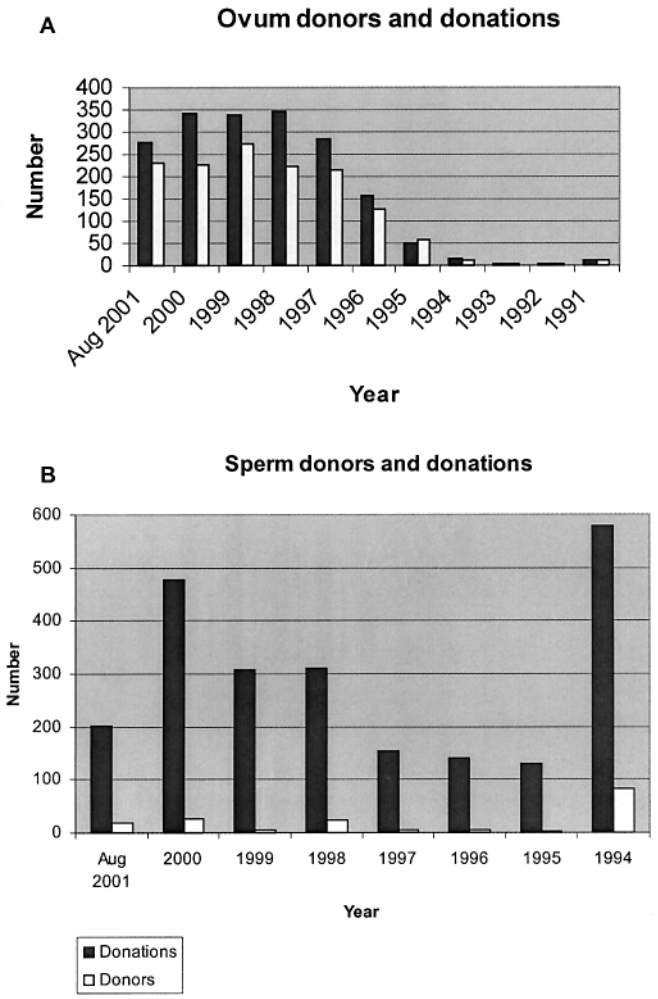

Figure 3. Bar diagram representing the number of oocyte donors (**A**) and donations (**B**) since 1991.

are restricted to a relatively small population. In conclusion, the recruitment need for our female donors is higher than that for our male donors.

Since the advent of ICSI for overcoming the severe male factor, a decrease in the demand for sperm donors became evident. In 10 years, only 167 sperm donors were needed, and half of these were accumulated during and before 1994 (Figure 3B). Due to the increasing use of assisted reproduction technology and the opening of new branches of our centres, as well as the offer to send semen samples to other centres, there has an increase in the quantity of both sperm donors and samples frozen in recent years.

On the other hand, the delay in seeking conception, together with the high prevalence of aetiologies that need ovum donation, has created demand for a high number of female donors (1991), which has increased in recent years (Figure 3A).

This has required that different psychosocial criteria are employed for selecting male and female donors, as reflected by the cultural background of each population, where 23% of our ovum donors are university students, as are almost 95% of our sperm donors. Also, the economical compensation for ovum or sperm donation which is €900 per cycle and €45 per sample respectively, is a considerable incentive for women needing cash.

Based on all of these observations, we can conclude that the use of donated sperm and ova is an extremely safe option for infertile patients where the use of their own gametes is not possible or where there have been continuous assisted reproduction treatment failures, if all the directives are strictly followed. Although the presence of serious STD and genetically transmitted anomalies is very low, controls for these conditions are essential.

Finally, all the institutions must recognize and inform the patients that there is no way to fully assure the total absence of risk by using donated gametes. Nevertheless, our results more than adequately show that these risks, if any, are minimal, when a good selection procedure and periodical tests are carried out.

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