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BACKGROUND: The demand for sperm donors has continued despite the introduction of ICSI. This study was undertaken in the light of impending changes in donor anonymity laws to evaluate the recruitment process of sperm donors. METHODS: Retrospective analysis of 1101 potential sperm donors in a tertiary referral centre between January 1994 and August 2003. The main outcome measures were to determine the demographic details, recruitment rate and reasons for rejection of donors. RESULTS: The majority of the applicants were aged <36 years (88.07%), students (54.88%), without a partner (53.47%), unmarried (85.38%) and without proven fecundity (78.67%). Only 3.63% of the applicants were released as donors, 30.79% defaulted, whilst 64.48% were rejected. The most common reason for rejection was suboptimal semen quality (85.07%). Over the years, the numbers of the applicants and released donors have declined significantly. The overall clinical pregnancy rate from donor sperm during this period was 23.52%. CONCLUSIONS: In this successful anonymous sperm donor programme only a small proportion of the applicants are released as donors. The significant decline in released sperm donors coupled with the potential effects of loss of donor anonymity means that new strategies for sperm donor recruitment are urgently required.

Key words: anonymity/donor/recruitment/sperm

Introduction

One in six couples have fertility problems. The Human Fertilisation and Embryology Authority (HFEA) reported that male factors are responsible in 30% of cases, female factors in 40%, and the rest are associated with combined male and female factors and unexplained infertility (HFEA, 2004). The advent of assisted reproductive techniques, ICSI in particular, has revolutionized the treatment of male factor infertility. The demand for sperm donors, however, has continued in reproductive medicine (Hamilton, 1998; Gorrill et al., 2003). Since the HFEA register was set up in 1991, there have been 3088 registered sperm donors in the UK. From August 1991 to March 1997, 12086 babies have been born using donor sperm (HFEA, 2004).

The studies on the recruitment of sperm donors have reported a poor recruitment rate (Lui et al., 1995; Murray and Golombok, 2000; Akinrinola et al., 2003). The recruitment rate depends on the availability of interested potential sperm donors and the standard of quality control of the recruitment process. The availability of potential sperm donors is influenced by several factors, e.g. awareness of the magnitude of the problem and the existence of sperm donor programmes, motivation, concern about anonymity, concern about inadvertent incest, financial incentive (Robinson et al., 1991; Schover et al., 1992; Purdie et al., 1994; Lui et al., 1995; Lyall et al., 1998; Fortescue, 2003), and possibly, concern about personal history, sexual orientation or history of sexually transmitted diseases being exposed. The standard of quality control of the recruitment process has been improving since its inception with a consequent reduction in the recruitment rate (Le Lannou and Lansac, 1989). The need for a robust screening process cannot be over-emphasized given the concerns regarding potential transmission of infection to the recipient and hereditary diseases to the offspring via the donated sperm (McLaughlin, 1999; Bresson et al., 2003). Many researchers have reported a decline in the fertility rate and increase in the number of men with sperm counts in the subfertile range (Carlson et al., 1995; Medras and Jankowska, 1999; Jensen et al., 2002). Following the Department of Health announcement on 21 January 2004, a change in the law is planned which means that children born as a result of sperm, oocyte or embryo donation after April 2005 will be able to access the identity of their donor when they reach the age of 18 years (HFEA, 2004).

Removal of donor anonymity and decline in sperm parameters, as suggested by some researchers, may have an impact on both the demand for, and recruitment of, sperm donors (Robinson et al., 1991; Schover et al., 1992; Purdie et al., 1994; Lui et al., 1995; Lyall et al., 1998; Fortescue, 2003; Sripada et al., 2004), particularly since as yet no mechanism has been established to
allow for this provision, resulting in uncertainty for both recruits and recruiters.

This study was undertaken to evaluate the recruitment process of anonymous sperm donors at Newcastle Fertility Centre at Life, a tertiary referral centre in Reproductive Medicine. The main outcome measures were to determine the demographic details of potential and released donors, the recruitment rate and the reasons for rejection of potential donors.

Materials and methods

A retrospective analysis of unit records of all potential sperm donors between January 1994 and August 2003 was performed. A total of 1101 men applied as potential sperm donors during that period.

The absolute exclusion criteria for sperm donors in this unit include age >45 years and ≤<18 years; history of sexually transmitted diseases; high risk behaviour or circumstances, e.g. homosexual/bisexual men, drug users, haemophiliacs, and men sexually involved with the members of the preceding groups; personal/family history of significant genetic/chromosomal diseases; suboptimal semen quality, adoption (unknown family history), and donor elsewhere. (registered as sperm donor in other Reproductive Medical Unit). The minimum criteria for acceptable donor semen quality include volume >1 ml, concentration >60×10^6/ml, grade A + B motility >60%, Mar test negative, morphology >15% normal and post-thaw motility >12×10^6/ml (Nielsen et al., 1984; Mayaux et al., 1985; Yavetz et al., 1991; Oettle et al., 1992; Verheyen et al., 1993; Mossad et al., 1994; Ford et al., 1996; Ecochard et al., 1999; Williams and Alderman, 2001; Miller et al., 2002).

The recruitment process includes advertisement, initial phone call questionnaire, semen analysis including freeze–thaw assessment, in-depth medical questionnaire sent by post, medical review, screening tests, general practitioner’s corroboration, provisional recruitment, semen quarantine, repeat tests to exclude infection, and release as donor. Advertisement is made through student magazines, local magazines and newspapers. Phone calls from interested men are answered and provisional questionnaires filled out by one person dedicated for the job. Personal details and a brief history are obtained to check for the suitability of the men for consideration as sperm donors. Information about the sperm donation programme are sent out and an appointment for semen analysis arranged. Once the semen quality (both fresh and post-thaw) is found suitable, the in-depth medical questionnaire is sent to the potential donor and he is seen at the centre for medical review. At that time personal and family histories are explored in greater detail and investigations performed to check for blood group and rhesus type, karyotype, cystic fibrosis carrier status, human immunodeficiency virus (HIV), hepatitis B and C, cytomegalovirus, syphilis, gonorrhoea and chlamydia. The general practitioner is contacted to confirm the suitability of the man as donor. The man is provisionally recruited if the screening tests are negative and the general practitioner supports him as a donor. Semen samples are collected and kept under quarantine for 6 months, when investigations for sexually transmitted infections are repeated. If these remain negative the semen is released for donation.

Data were analysed to determine the demographic details of the potential and released donors; the recruitment, default and rejection rates; the reasons for rejection of potential donors and the trends in the number of applicants, defaulters and released donors.

Statistical analysis

Statistical analysis was undertaken on StatsDirect Version 2.3.5 (StatsDirect Ltd, Sale, Cheshire, UK) by χ^2-test with Yates’ correction, Fisher’s exact test and Spearman’s rank correlation.

Results

Applicants

During the study period of ~10 years, 1101 men applied as potential donors. Whilst all released donors were aged 18–45 years, the ages of 805 (73.11%) applicants were documented at that stage. As the age of the applicants increased, their numbers decreased [95% confidence interval (CI): 0.27–0.31] showing that younger men were more likely to apply. In fact there were significantly fewer applicants aged >35 years [96 (11.93%) versus 709 (88.07%); 95% CI: 0.01–0.02]. Interestingly, despite published age limits, two men below 18 years and five men aged >45 years did show their interest in sperm donation. The number of students was significantly greater than that of non-students [557 (54.88%) versus 458 (45.12%); 95% CI: 1.24–1.77] as was the number of employed men compared with unemployed men [357 (35.17%) versus 101 (9.95%); 95% CI: 9.03–17.29], showing that students were more likely to apply than non-students as did employed men compared with unemployed men. The number of applicants without partner was significantly greater than that with partner [578 (53.47%) versus 503 (46.53%); 95% CI: 1.11–1.57] showing that men without partner were more likely to apply. The number of applicants who were unmarried was significantly greater than that of married men [923 (85.38%) versus 158 (14.62%); 95% CI: 26.69–43.64] showing that unmarried men were more likely to apply. The number of applicants without proven fecundity was significantly greater than that with proven fecundity [852 (78.67%) versus 231 (21.33%); 95% CI: 11.02–16.80] (Table I).

The information sources from which the applicants received the information about the sperm donor programme were documented in 1000 (90.83%) cases. In 11 cases two sources of information were documented. The common information sources were the media (369, 36.50%), student sources (355, 35.11%) and word of mouth/friends (213, 21.07%) (Table II). The commonest information source in the age group ≤35 years was student sources (48.04%), followed by the media (24.03%), word of mouth/friends (22.31%) and other sources (5.62%). In contrast, the commonest information source in the age group >35 years was the media (56.98%), followed by word of mouth/friends (18.60%), student sources (15.12%) and other sources (9.30%). In the age group ≤35 years in comparison with the age group >35 years, the use of media was significantly less (95% CI: 0.15–0.39), but that of student sources was significantly greater (95% CI: 2.78–10.41). Between these groups, however, there were no significant differences in using word of mouth/friends (95% CI: 0.69–2.39) and other sources (95% CI: 0.25–1.50). For individual media sources, the uses of local newspapers (95% CI: 0.13–0.53) and television (95% CI: 0.11–0.71) were significantly less in the age group ≤35 years (Table III).

The commonest information source for the students was student sources (51.68%), followed by the media (26.03%), word of mouth/friends (18.91%) and other sources (3.38%). In contrast, the commonest information source for the non-students was the media (48.60%), followed by word of mouth/friends (23.72%), student sources (16.05%) and other sources (11.63%).
Compared with the non-students, the uses of media (95% CI: 0.28–0.49) and other sources (95% CI: 0.14–0.47) were significantly less by the students, but that of student sources was significantly greater (95% CI: 4.07–7.73). There was no significant difference in using word of mouth/friends (95% CI: 0.54–1.04). For individual media sources, the uses of local newspapers (95% CI: 0.05–0.17) and television (95% CI: 0.10–0.43) were significantly less by the students, but interestingly their use of magazines was significantly greater (95% CI: 1.09–2.21) (Table IV).
Out of a total of 1101 applicants, 40 (3.63%) were released as sperm donors, five (0.45%) remain under investigation, seven (0.64%) are in quarantine, 87 (7.90%) were rejected by phone call questionnaire; 308 (27.97%) defaulted the semen analysis appointment, 595 (54.04%) were rejected at the stage of semen analysis and the rest either defaulted or were rejected at various other stages. Thus a total of 339 (30.61%) or were rejected (682 men, 61.94%) before the initial phone call questionnaire, 308 (27.97%) defaulted the stage of medical appointment. After that the loss rate was only 38.96%. The main reason for rejection after recruitment was suboptimal semen quality apparent during semen donation (nine men, 64.29%) (Figure 1 and Table V). The drop-out rates of the students and non-students were 32.10% (147 cases) and 95.46%; 95% CI: 248.43–794.11), only a few had two (26 men, 4.37%) or three (one man, 0.17%). The number of applicants with acceptable semen quality declined significantly with increasing age (95% CI: 0.56–0.99) (Figure 2).

Over the years, there were significant declines in the number of applicants (95% CI: 0.23–0.30) and the release rates (95% CI: 0.11–0.53) per year. As a consequence the number of released donors per year had also declined significantly (95% CI: 0.11–0.53) per year. As a consequence the number of applicants (1019 men, 92.55%) either defaulted and 710 (64.49%) were rejected. Notably rejected at various other stages. Thus a total of 339 (30.79%) of applicants (95% CI: 0.23–0.30) and the release rates (95% CI: 0.82–1.43). The number of applicants defaulted per year had also declined significantly (95% CI: 1.03–7.59), unmarried (87.50%; 95% CI: 75.86–62778.92). The majority of them were without partner compared with those without a partner (95% CI: 0.01–0.17), but there were no significant trends in the number of applicants in other demographic areas.

**Table IV. Occupation of potential sperm donors and their information sources**

<table>
<thead>
<tr>
<th>Recruitment sources</th>
<th>No. of applicants</th>
<th>95% CI</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>964</td>
<td>534 (55.39)</td>
<td>1.28–1.85</td>
</tr>
<tr>
<td>Media</td>
<td>348</td>
<td>139 (26.03)</td>
<td>0.28–0.49</td>
</tr>
<tr>
<td>Magazines</td>
<td>175</td>
<td>112 (20.97)</td>
<td>1.09–2.21</td>
</tr>
<tr>
<td>Local newspapers</td>
<td>113</td>
<td>15 (2.81)</td>
<td>0.05–0.17</td>
</tr>
<tr>
<td>Television</td>
<td>53</td>
<td>12 (2.25)</td>
<td>0.10–0.43</td>
</tr>
<tr>
<td>Tabloids</td>
<td>4</td>
<td>4 (0.93)</td>
<td></td>
</tr>
<tr>
<td>Radio</td>
<td>2</td>
<td>3 (0.64)</td>
<td></td>
</tr>
<tr>
<td>Broadsheets</td>
<td>1</td>
<td>1 (0.23)</td>
<td></td>
</tr>
<tr>
<td>Student sources</td>
<td>345</td>
<td>276 (51.68)</td>
<td>4.07–7.73</td>
</tr>
<tr>
<td>Student magazines</td>
<td>173</td>
<td>138 (25.84)</td>
<td>2.62–6.02</td>
</tr>
<tr>
<td>Other student sources</td>
<td>172</td>
<td>138 (25.84)</td>
<td>2.69–6.25</td>
</tr>
<tr>
<td>Word of mouth/friends</td>
<td>203</td>
<td>101 (18.91)</td>
<td>0.54–1.04</td>
</tr>
<tr>
<td>Other sources</td>
<td>68</td>
<td>18 (3.38)</td>
<td>0.14–0.47</td>
</tr>
<tr>
<td>Health Service</td>
<td>35</td>
<td>13 (2.44)</td>
<td>0.21–0.97</td>
</tr>
<tr>
<td>Others</td>
<td>15</td>
<td>3 (0.56)</td>
<td>0.03–0.74</td>
</tr>
<tr>
<td>Workplace</td>
<td>12</td>
<td>12 (2.79)</td>
<td></td>
</tr>
<tr>
<td>Other donors</td>
<td>3</td>
<td>1 (0.19)</td>
<td>0.04 to 4.44</td>
</tr>
<tr>
<td>Internet</td>
<td>3</td>
<td>1 (0.19%)</td>
<td>0.04 to 4.44</td>
</tr>
</tbody>
</table>

Values in parentheses are percentages. *Out of 1101 applicants, 36 did not mention their occupation and 11 had two information sources.

Table V. The reasons for rejection of potential sperm donors

<table>
<thead>
<tr>
<th>Reasons for rejection</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suboptimal semen quality</td>
<td>604 (595 + 9 AR)</td>
<td>85.07</td>
</tr>
<tr>
<td>History of sexually transmitted diseases</td>
<td>49 (48 + 1 AR)</td>
<td>6.90</td>
</tr>
<tr>
<td>Adoption</td>
<td>13</td>
<td>1.83</td>
</tr>
<tr>
<td>Not documented</td>
<td>12 (8 + 4 AR)</td>
<td>1.69</td>
</tr>
<tr>
<td>Homosexual relations</td>
<td>8</td>
<td>1.13</td>
</tr>
<tr>
<td>Medical problems</td>
<td>8</td>
<td>1.13</td>
</tr>
<tr>
<td>Too old</td>
<td>6</td>
<td>0.84</td>
</tr>
<tr>
<td>Family history of medical problems</td>
<td>6</td>
<td>0.84</td>
</tr>
<tr>
<td>Donor elsewhere</td>
<td>2</td>
<td>0.28</td>
</tr>
<tr>
<td>Inappropriate behaviour</td>
<td>1</td>
<td>0.14</td>
</tr>
<tr>
<td>General practitioner not found</td>
<td>1</td>
<td>0.14</td>
</tr>
<tr>
<td>Total</td>
<td>710</td>
<td></td>
</tr>
</tbody>
</table>

AR = after recruitment.
always tended to be higher in the younger age groups. The release rates were also higher for students than non-students (4.85% versus 2.84%; RR: 1.71; 95% CI: 0.86–3.72), unemployed men than employed men (2.97% versus 2.80%; RR: 1.06; 95% CI: 0.46–4.13) and men without proven fecundity than men with proven fecundity (3.99% versus 2.6%; RR: 1.54; 95% CI: 0.64–4.60). None of these differences, however, was statistically significant. The released donors (40 men) donated 45 times on average (range 6–101; median 40) providing 1800 donations. A total of 22640 straws were stored from 12.58 straws per donation (range: 3.55–36.14, median 12.23) and 566 straws per donor (range 63–1534, median 507). The overall clinical pregnancy rate was 23.52% during this period, 30.18% for intrauterine insemination (IUI), 30.07% for IVF and 18.75% for donor insemination (DI) treatment (Table VII).

The total yearly demand for donor cycles declined after 1997, but rose since 2001 (95% CI: 1.22–2.21) mainly due to an increase in the number of DI treatment cycles (95% CI: 1.54–3.33) (Figure 4).

Discussion

In our study we have considered the 1101 men who applied as potential sperm donors over a period of ~10 years. The majority were aged ≤35 years, students, without a partner, unmarried and without proven fecundity. As the students were the main group targeted by the unit through advertisements in student magazines, this finding is not surprising. The number of non-student men who showed their interest in donating sperm, however, was substantial (458 men, 45.12%), despite the fact that they were not actively targeted. Following the withdrawal
of donor anonymity from April 2005 there is a presumption that the number of student applicants may decrease such that, in future, we may have to target the non-student men population to improve/maintain the recruitment rate. Previous studies have reported the difficulty in motivating interested men to become sperm donors. Similar to our study, Lyall et al. (1998) found that the students were the majority amongst the potential sperm donors. Purdie et al. (1994) reported that while many people are aware of, and receptive to, the idea of being donors, very few act. Many would prefer that their sperm were used for only one or a few couples about whom they had some information. Objections to donation centred mainly on discomfort at having children outside their family, worry about future contact with donor insemination children, and worry about inadvertent incest. Robinson et al. (1991) found that in the subset of potential sperm donors, 85% would not enter a sperm donation programme unless anonymity was maintained, but 60% would agree to the release of non-identifying medical records. They concluded that although established sperm donors would continue to donate sperm if their status of anonymity was withdrawn, recruitment of new donors would be significantly reduced, and that this would be to the detriment of gamete donation programmes and to the subfertile couples who request this form of treatment.

The common information sources to the potential donors were the media, student sources and word of mouth/friends. While some of the media sources such as magazines and local newspapers, where the advertisements were placed, contributed significantly as information sources, others such as the television, radio, tabloids and broadsheets did not. This reflects the importance of advertisements in informing people about the sperm donor programme. The fact that word of mouth/friends played an important role as an information source emphasizes the importance of indirect ways of propagating information. While internet plays an important role as a source of information for patients seeking infertility treatment (Rawal et al., 2004), that is not the case for potential sperm donors. In the age group ≤35 years the use of media was significantly less and that of student sources was significantly greater. Interestingly, their use of word of mouth/friends and other sources was not significantly different from that of men >35 years. As expected, the commonest information source for the students was student sources, but interestingly almost half of them obtained information from non-student sources. While the commonest information source for the non-students was the media, a substantial proportion of them obtained information from student sources. Although word of mouth/friends was an important source of information for both the groups, there was no significant difference between them. For individual media sources, the uses of local newspapers and television were significantly less by men ≤35 years and the students, but interestingly the use of magazines by the students was significantly greater than non-students. These data show that while the student sources are the main sources of information for the students and men ≤35 years, the media (magazines in particular) play an important role as well. Although the media was the main source of information for non-students and men >35 years, a substantial proportion of them obtained information from the student sources. This means that the information sources, conventionally thought to target a particular group of men, are not exclusively used by that group.

The most striking finding of our study is the significant decline in the number of applicants for sperm donation. In particular, the number of applicants per year fell sharply after 2000 and that was preceded by a sharp rise in the default rate in 2000. It is possible that this was related to the growing awareness of planned removal of donor anonymity. It clearly indicates that fewer men were willing to come forward for sperm donation via an approved centre. In addition, the release rate has declined over the years due to introduction of stringent criteria to improve the standard of the recruitment process (Le Lannou and Lansac, 1989). As a consequence, the trends in the number of the released donors showed a significant decline. Interestingly, there was a significantly increasing trend in the number of applicants who had a partner compared with those without a partner, but there were no significant trends in the number of applicants in other demographic groups.

Only 3.63% of the overall applicants were released as sperm donors, while a substantial number defaulted (30.79%) or were rejected (64.49%). The majority of the willing men (92.55%) either defaulted (30.61%) or were rejected (61.94%) even before the stage of medical appointment. Interestingly, there is no significant difference in the default rate between the students and non-students or men ≤35 years and men >35 years. The high default rate suggests that a substantial number of the potential donors changed their mind once they had detailed information about the donor programme. The possible reasons for that may be concern about personal history, sexual orientation or history of sexually transmitted diseases being exposed or dislike about the recruitment process itself (27.97% defaulted the semen analysis). Interestingly, despite this, seven (0.64%) of the applicants were rejected as their general practitioner did not recommend them as sperm donors because of past history of sexually transmitted diseases or personality disorder. This information was suppressed by the applicants despite having a detailed medical review during the recruitment process. If we are to improve the recruitment rate we need to consider measures to reduce the high exclusion rates at some stages of the process. Sidhu et al. (1997) also reported a low recruitment rate of 12.56% and highlighted the difficulty in recruiting sperm donors due to high drop-out (61.31%) and rejection rates (26.13%).

In our study the commonest reason for rejection was suboptimal semen quality (85.07%). Sidhu et al. (1997) also reported poor semen quality as the major reason for rejection of sperm donors. The minimum standard for donor semen quality in this unit comprises a sperm concentration of >60×10⁶/ml and grade A+B motility of >60%. These are substantially higher than the WHO criteria for normal semen quality. This is to account for the loss in the semen quality that occurs due to the freeze–thaw procedure during donor treatment and as a post-thaw motility of >12×10⁶/ml is also considered a minimum requirement in this unit. While great variation in the criteria for donor semen quality exists between sperm banks (Carrell et al., 2002), a high minimum standard is important to achieve good success.
rates as concentration, motility and post-thaw quality are important predictive factors in sperm donor treatment (Mossad et al., 1994; Ecochard et al., 1999; Williams and Alderman, 2001; Miller et al., 2002). Navarrete et al. (2000) suggested the use of a modified sperm penetration assay on frozen donor semen to estimate donor fertility potential to exclude poor quality applicants, thereby increasing pregnancy rates while decreasing donor screening costs.

Since in this study, suboptimal semen quality was the single most common reason for exclusion of potential donors, a relaxation in the standard of acceptable donor semen quality would substantially increase the recruitment rate of donors. However, it may be associated with a reduction in the success rate that may not be desirable.

Other factors, such as seasons and the duration of abstinence, which may influence the semen quality, could be considered to improve the recruitment rate (Cooper et al., 1993; Centola and Eberly, 1999; Gyllenborg et al., 1999; Chen et al., 2003), but the evidence remains inconclusive. The commonest reason for rejection of potential sperm donors due to suboptimal semen quality was a combination of concentration and grade A + B motility (50.76%). Of note, 95.46% of applicants rejected due to suboptimal semen quality had only one semen analysis performed. Sidhu et al. (1997) reported that they considered two semen analyses as optimal. Considering the fact that semen quality is variable in relation to time, performing at least two semen analyses may have a role in improving the rate and efficiency of the recruitment process. First, it may reduce the number of men rejected on the basis of initial suboptimal semen quality. And second, it may allow earlier detection of the men that were otherwise rejected on the basis of variable semen quality once donation commenced.

The number of applicants with acceptable semen quality declined significantly with increasing age. Several researchers reported that semen parameters and fertility decline with advanced age (Cooper et al., 1993; Centola and Eberly, 1999; Kidd et al., 2001; Chen et al., 2003; Eskenazi et al., 2003). Gallardo et al. (1996), however, reported that age (up to 64 years) does not affect sperm characteristics or the sperm’s ability to fertilize human oocytes, and embryo development in vitro and its implantation. There have been growing concerns about the association of advanced paternal age with new mutations in the paternal genome and an increased risk of aneuploidy in the fetus (Thepot et al., 1993; Griffin et al., 1995; Fletcher and Marsden, 1996; Griffin, 1996; Moloney et al., 1996; Thepot et al., 1996; Wyrobek et al., 1996; Crow, 1997; Tolarova et al., 1997; Tellier et al., 1998; Asada et al., 2000). Therefore, The British Andrology Society (McLaughlin, 1999) has recommended that the sperm donor should be <40 years old. In our study, the upper age limit was 45 years in accordance with the HFEA guidelines. However, only one (2.5%) of the released donors was aged >40 years old. In addition, men aged >40 years were less likely to be released compared with those aged ≤40 years, thereby increasing the cost of recruiting them. Therefore, adopting an upper age limit of 40 years may not have a significant impact on the recruitment rate, whilst it may reduce the cost of recruitment. It is possible to reduce the number of applicants rejected on the basis of history of sexually transmitted diseases. In the British Andrology Society guidelines for the screening for donor insemination (McLaughlin, 1999), contrary to the criteria in this unit, a distant past history of bacterial sexually transmitted disease is not an exclusion criterion as long as the donor is shown to be negative at the time of donation and adequate treatment can be shown to have been given. This history could then be explored during the medical review rather than at the stage of application, although hepatitis C virus, HIV etc. should be mentioned specifically with clear explanation about the diseases that exclude the applicants. This may also reduce the default rate after the initial contact that may be related to concerns about a personal history of sexually transmitted diseases being exposed.

The majority of the released donors were students (67.50%), unmarried (87.50%), without partner (62.50%) and without proven fecundity (85.00%). The demographic characteristics of the potential donors, however, did not influence their release rates significantly. This compares well with previous reports (Lyall et al., 1998; McLaughlin, 1999).

The total yearly demand for donor treatment cycles declined in 1997, but started rising again after 2001. The initial decline coincides with the introduction of ICSI in the unit. The inverse correlation between the number of ICSI cycles and the demand for donor cycles has been well documented (Hamilton, 1998). The later rise in the demand for donor treatment cycles may be related to the accumulation of cases of failed ICSI and increase in the number of single women requesting donor treatment. The number of DI cycles performed has been rising consistently in contrast to donor IUI and donor IVF cycles. This is in keeping with improved donor fecundity.

The overall clinical pregnancy rate during this period was 23.52%, for IUI 30.18%, for IVF 30.07% and for DI 18.75%. This compares favourably with the national average and outcome reported in the literature. In fact the clinical pregnancy rates for IUI and DI were substantially higher than the national average and other reported outcome of 8–12.1% (Le Lannou and Lansac, 1989; Ecochard et al., 1999; Williams and Alderman, 2001; Miller et al., 2002; HFEA, 2004). Any compromise with the minimum acceptable standard of donor semen quality in this unit, to improve the recruitment rate, may have a negative impact on the success rate of donor treatment.

In conclusion, the present study shows that in a successful sperm donor programme only a small proportion of the applicants are released as donors. The numbers of the applicants and released sperm donors have been declining, and may decrease further in the future due to the removal of donor anonymity and possible decline in the semen quality. The proposed changes in the HFEA review on Sperm, Egg and Embryo Donation (SEED Review, 2004) and the Directive 2004/23/EC (2004) on standards relating to the handling and use of human tissues and cells may lead to further reduction of donor treatment activity. This may have serious resource implications for future donor treatment. Interventional strategies to improve sperm donor recruitment are urgently required. Reduction of semen standards may increase released donor numbers but at the cost of success rates. The number of students applying for sperm donation in this unit has fallen substantially since the Department of Health announcement about removal of donor anonymity. The
present strategy in this unit is to change the population targeted although it has yet to be shown that this will meet the expected donor shortfall.

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