Since 1967 artificial insemination by donor has been used in our practice to treat selected patients with infertility due to male sterility. Towards the end of 1982 the 1,000th pregnancy resulting from AID with frozen semen provided a suitable juncture for a comparative study to be undertaken on fresh and frozen semen. During the first 2–3 years of AID practice fresh semen was exclusively employed. Recently treatment tended more and more to the use of cryopreserved semen for practical and organizational reasons. Fresh semen insemination poses the difficult problem of trying to prevent the chance meeting of donor and recipient; furthermore the availability of fresh semen could not always be guaranteed and patients coming from far afield were subjected to intolerable stress. Frozen semen has the advantage that the same donor can be used when ovulation is delayed.

The selection of donors in our practice followed the internationally recognized principles. When 10 pregnancies have been achieved using the same donor's semen he is not recalled for further donations unless the patient wishes to undergo treatment for a second or third pregnancy. By and large most donors are selected from the medical profession, not only on account of intelligence but also the necessary understanding and responsibility for this method of treatment which such individuals possess.

METHODS

Patients are referred by their local gynaecologist at the optimum time for commencement of treatment. The cycle was monitored by serum FSH,
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Oestradiol and the cervical score. More recently the maturity of the follicle is checked by ultrasound. Ovulation induction with clomiphene citrate, hMG and HCG is only undertaken in exceptional cases. A semen sample is obtained and treated with penicillin to ensure complete eradication of bacteria. For improved motility, experiments with Kallikrein and caffeine have been carried out but these showed no perceptible improvements in conception rates.

Samples of semen for freezing are first examined for morphology and motility, diluted 1:1 with an appropriate cryopreservation media to which penicillin has been added and then subjected to a layering, freezing procedure ensuring optimum crystallization protection. The insemination procedure consisted of placing semen in contact with the cervix by means of a cervical cap. Because of uterine contractions and an increased risk of infection we no longer use the intrauterine or intercervical methods. The latter method is unphysiological; furthermore capacitation of sperm is improved when they remain in contact with cervical mucus. Insemination is commenced 2–3 days before the expected time of ovulation. The comparisons between fresh and frozen semen do not take into account the organic or physiological characteristics of the patients, nor the condition of the uterus and tubes. However treatment may have taken place outside the centre. Psychological factors pertaining to sterility are not examined or included in the statistics. Our investigations merely compare conception rates (birth, miscarriage) in fresh and frozen semen and the number of treatment cycles in relation to the age of the patients. Patients who have discontinued treatment before pregnancy or those still receiving treatment have not been included in the study.

RESULTS

In younger women, up to 25 years of age, there was a higher pregnancy rate with fresh than frozen semen (Figure 1); in cases necessitating a longer duration of treatment the situation was reversed in that frozen semen was more effective when treatment lasted longer than one year.

In the 26–30 year age group similar results were obtained whereby therapy using fresh semen was more successful in the shorter time. The same was true for the 31–35 age group. In older patients (36 years and over) fresh semen was at least 30% more successful than frozen semen. Almost two thirds of pregnancies were obtained within the first 10 treatment cycles and a third of these in the first three months (Figure 2). Even in the first cycle 11.2% became pregnant from fresh semen and 7.5% from frozen semen. After two treatment cycles there was a pregnancy rate of 23% from fresh semen and 15% from frozen. The average insemination time until the patient became pregnant was 7 months with fresh semen and 9 with frozen. The total birth rate was 46.6% with fresh and 41.5% with frozen. Only one third of patients over 36 years of