

patients using these, 16 either failed to appreciate that the tyres were flat or did not know how to inflate them. Their mental function test score did not differ from that of those whose tyres were fully inflated. Altogether 15 women and four men did not know how to pump up tyres, and 11 patients did not possess a pump. Two wheelchairs had a different type of valve connection on each wheel; the users were not aware that the pump could be adapted to both types of valve. Fourteen wheelchairs had primary brake defects (six of these also had flat tyres). In 10 cases the brake spring was too weak and in four it was too stiff.

Comment

Most wheelchairs have inflatable tyres because compressed air is light and ensures a comfortable ride.² In Britain the wheelchair brake mechanism requires the brake lever to be pushed or pulled so that the brake plate presses against the outer rim of the tyre. Tyre and brake problems are the commonest reasons why wheelchair users request help from appliance centres. Fenwick found that 12% of wheelchair users had had tyres repaired in the previous year.¹ Neither of the major surveys of patients in wheelchairs, however, mentioned the problem of flat tyres.^{1,3}

The power required to propel and manoeuvre a wheelchair is considerable,⁴ and if the tyres are flat even more effort is needed. One third of our elderly patients had wheelchairs with inadequately inflated tyres, which may render patients housebound. How many wheelchair users would become more mobile if their tyres were correctly inflated has yet to be determined.

Some wheelchair users have no pump, and many, especially elderly women, do not know how to use one. We suggest that as part of their general instructions users of wheelchairs are shown how to use a pump. Inspection of tyres and brakes should be a routine part of the assessment by those taking part in community care of immobile elderly patients using wheelchairs; community nurses and doctors might consider carrying a pump on their rounds.

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¹ Fenwick D. *Wheelchairs and their users*. London: HMSO, 1977.

² Bingham DH. Wheelchairs and appliances. *Clin Rheum Dis* 1981;7:395-415.

³ Harris A, Cox E, Smith CRW. *Handicapped and impaired in Great Britain*. Part 1. London: HMSO, 1971.

⁴ Hildebrandt G, Voight ED, Behn D, Berender B, Kruger J. Energy costs of propelling wheelchairs at various speeds: cardiac response and effect of steering accuracy. *Arch Phys Med Rehabil* 1970;18:23-9.

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Use of home insemination in programmes of artificial insemination with donor semen

Artificial insemination with donor semen (AID) is increasingly being used to help the childless and some of those couples who are at risk of producing children with genetic disease.¹ Public knowledge of the service has become widespread, with most clinics reporting an increased demand and many now having waiting lists that are considerably larger than they would prefer. In addition, some couples find attending a hospital clinic stressful, which may be a factor in their inability to achieve a pregnancy. This is particularly true of clinics that serve a wide catchment area. (The clinic at this hospital receives women from a large metropolitan county as well as other parts of central England and Wales.)

In a pilot study we circumvented this problem by teaching couples to inseminate themselves and providing portable liquid nitrogen refrigerators for either home treatment or treatment by family practitioners. This service has been reasonably successful and we report here the results.

Patients, methods, and results

Couples were referred from the AID clinic at Birmingham Maternity Hospital or directly from an interested family doctor. In five cases the male partner presented with azoospermia, and the remaining two with oligozoospermia. All of the women (age range 27-36 years) had had several unsuccessful cycles of insemination at the hospital clinic and had had tubal patency established by laparoscopy and hydrotubation. Three had begun clomiphene while attending the hospital clinic, in one case to control irregular cycles and in the other two on an empirical basis. Most lived at least one hour's drive from the hospital, and two had to travel for between four and five hours for each visit. Another had had a previous pregnancy after artificial insemination elsewhere and found that even short journeys with a toddler were difficult.

After being accepted into the programme couples attended the clinic at about the time of ovulation for instruction in the use of equipment and the assessment of the signs of ovulation. Two women were inseminated by their family doctors, who were provided with full written instructions. Donor semen was frozen in 0.25 ml straws² and kept in a large storage bank until required. Insemination was taught using either reusable insemination guns (IMV, L'Aigle, France) designed to hold the semen straws or disposable mucus collection syringes (Rocket, London). The partner was taught to inseminate 0.5 ml semen into the cervix after exposing it with a stainless steel Cusco speculum, which was washed after each use. Insemination was carried out on two or three consecutive days at around the expected time of ovulation. No straws were ever returned.

Portable liquid nitrogen refrigerators (DX2AR, L'Air Liquide) capable of holding the straws frozen for 12-14 days were supplied three or four days before ovulation was expected. Elementary precautions in the handling of these refrigerators assured that they presented no particular hazard. Each cost about £250, and couples were offered the option of buying their own or using one from the clinic for the same monthly cost (£25) as hospital artificial insemination.

Of the seven women who started treatment, three became pregnant after one, three, and three cycles of treatment, two of these delivered safely, and the third pregnancy was continuing. Two women decided to abandon treatment (after eight and four cycles of treatment) in favour of adoption. One patient was continuing with treatment after five cycles, while the seventh patient chose to move to another centre to have in vitro fertilisation and embryo transfer with donor semen after five unsuccessful home inseminations and 10 cycles of unsuccessful insemination at the hospital. All three pregnancies occurred in women who had had unsuccessful attempts at the hospital clinic (with six, four, and five cycles of treatment respectively).

Comment

Insemination with donor semen either at home or by a family doctor may be a practical method of achieving a pregnancy in some infertile couples. Most couples learnt the technique very quickly and had no problems with the equipment. The general practitioners who participated also found the treatment interesting and easy to undertake.

Insemination in the evening, before going to sleep, might be more successful in achieving a pregnancy. The technique reduces strain on clinic resources and appears to be acceptable to some infertile couples, particularly since it permits more participation of the partner.

¹ Newton JR. Current status of AI in clinical practice. In: *Artificial insemination: proceedings of Fourth Study Group of the Royal College of Obstetricians and Gynaecologists*. London: RCOG, 1976:25-41.

² Richardson DW. Techniques of sperm storage. In: *Artificial insemination: proceedings of Fourth Study Group of the Royal College of Obstetricians and Gynaecologists*. London: RCOG, 1976:97-125.

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