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Original Articles

ELECTROEJACULATION FOR FERTILITY IN MEN WITH SPINAL CORD INJURY

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ABSTRACT

From October 1990, to June 1992, more than 800 electroejaculations and 108 intrauterine inseminations (IUI) were performed in 250 paraplegic males and their wives. Seven successful pregnancies are the results of this 20-month effort. This is the first report of electroejaculation and successful pregnancy with its use in paraplegics in Iran and the Middle East.
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INTRODUCTION

Although spinal cord injury (SCI) leads to many chronic medical rehabilitative problems, advances in physical medicine and urology in the last five decades have greatly improved survival and general health status for these patients.[1]

Nevertheless, for these men, many of whom before their trauma were sexually active and in their potentially "parenting years," a matter of major concern is their future sexual function and reproductive capability.[1] The estimated fertility rate for spinal cord injured males is poor,[2] and spontaneously initiated pregnancies will be achieved in only 10% or less.[2] Infertility in SCI men is attributed to ejaculatory dysfunction, blockage of the genital ducts secondary to infection, together with impaired spermatogenesis.[3] Severe oligoasthenoteratospermia is a common finding.[4] Impaired spermatogenesis may be caused by elevation of scrotal temperature, poor drainage of the reproductive tract, anti-sperm antibodies, and recurrent urinary or genital tract infections.[5,6]

Electrical stimulation was first used in the animal model in 1863,[7] when Echnardt applied an electrical current to the branches of the sacral nerves to induce penile erection. Further work in this regard was conducted in primates.[8,9] Electroejaculation in man dates back to the work of Learmonth,[10] and later Bucy and associates, who stimulated the presacral nerves of man simultaneously with insertion of a cystoscope into the urethra. On stimulation, the prostatic urethra became obscured by seminal-like fluid containing spermatozoa.[10]

METHODS AND MATERIAL

Between October 23, 1990 and June 22, 1992, 800 electroejaculations were performed on 250 para- and quadriplegic men. They were all war-injured, and between three to 12 years had passed from the date of their injury.

In this period of time, 108 IUI (intrauterine inseminations) were performed in 50 couples. Semen samples were obtained through electroejaculation techniques. If the semen sample met the criteria of Table I, we candidated them for IUI, and if not, we repeated the electroejaculation test. We could obtain at least 0.5 ml of semen in more than 90%

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of paraplegic or quadriplegic males that referred for infertility. For sperm processing, the semen was washed with Ham's F-10 and centrifuged at 3000 RPM for five minutes, and the supernatant aspirated. Then one ml of medium was gently added to the pellet at the bottom of the tube and incubated at 37°C for 45 minutes at a 45° angle. High motility spermatozoa were harvested from the medium after 45 minutes. The motile spermatozoa were injected transvaginally into the uterus.

Ovarian stimulation was performed with clomiphen citrate, 50 mg twice dialy on days five to 10 of the menstrual cycle. Transvaginal ultrasonography was used to assess the ovulation. When the size of the largest follicle reached 20 mm, 10,000 IU HCG was injected intramuscularly and 36 hrs later, IUI was performed.

RESULTS

Between Oct. 23, 1990 and June 22, 1992, 800 electroejaculations and 108 IUIs were performed in the Yasser Hospital. 37.2% of patients were azospermic, 33.8% of patients were oligoasthenospermic, or high sperm counts, although their sperm motility was poor or absent. Five pregnancies occurred with electroejaculation and IUI. One pregnancy with masturbation and IUI also occurred in this period and one with retrograde ejaculation and IUI. First healthy twin infants with electroejaculation and IUI (one male infant weighing 1450 grand one female infant weighing 1750 gr) were delivered in Tehran by caesarean section at 36 weeks.

DISCUSSION

In this study, from 250 paraplegic males, 37.2% were azospermic, and despite frequent electroejaculation tests performed for this group, improvement did not occur and it seems that they have poor prognosis to become fathers at present. 33.8% of patients were oligoasthenospermic and study on them is not yet completed. About 30% of patients had normal or high sperm counts. An uncontrolled study on 30 paraplegic males that had sperm counts more than 300 million/ml, shows that repeating of electroejaculation at short intervals improves the sperm motility and decreases the sperm count.

Electroejaculation and its successful application in paraplegic patients for fertility is a great achievement and step forward in bringing hope for a happy life in spinal injured patients. Further investigation is needed in this regard to improve sperm motility and to achieve more successful results.

Table I. Criteria for patient selection for IUI using electroejaculation specimen

Sperm count $\geqslant$ 20,000,000
Normal motility $\geqslant$ 20%
Normal forms $\geqslant$ 20%

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