

Paraplegic men and assisted reproductive technology Paraplegia masculina e procriação medicamente assistida – a nossa experiência

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Abstract

Overview and Aims: Infertility in paraplegic men may be due to an ejaculatory disorder or poor sperm quality. Couples facing this situation still have the opportunity to conceive with the use of methods for assisted ejaculation or testicular sperm extraction in association with assisted reproductive technology (ART). The aim of this study was to evaluate the success of ART in couples with spinal cord injured (SCI) men.

Study Design: Retrospective observational study.

Population: Fifteen couples with SCI men.

Methods: The clinical files of all couples with SCI men submitted to ART between July 2005 and July 2010 were reviewed. The total number of cycles carried out, the sperm retrieval technique, the sperm sample cryopreservation and the pregnancy rate and outcome were analyzed.

Results: Fifteen couples with SCI men were submitted to a total of 31 cycles. Fourteen men had SCI due to traumatic causes and one due to non-traumatic causes. In 16 cycles sperm was obtained by electroejaculation, in 14 cycles by testicular biopsy and one couple was submitted to a donor sperm program due to azoospermia in the testicular biopsy. Five IVF and 26 ICSI cycles were carried out, 13 with fresh and 18 with cryopreserved sperm samples. Seven of the 15 couples achieved pregnancy (47%), presenting a successful pregnancy rate per cycle of 23% (up to 4 cycles per couple). One twin and 6 singleton pregnancies presented with full-term newborns.

Conclusion: In most cases, it is possible for paraplegic men to start a family. As shown by our results a high successful pregnancy rate is possible, thanks to the close collaboration between gynecologists, andrologists, embriologists and physiatrists.

Keywords: Assisted reproductive technology; Paraplegia; Spinal cord injury; Infertility; Ejaculation.

INTRODUCTION

Spinal cord injury (SCI) is one of the most devastating traumas, both in organic and psychological terms. Infertility in men with SCI may be due to ejaculatory disorder or poor sperm quality. Among others, the latter can be due to stasis of seminal fluid, abnormal seminal plasma, antisperm antibodies, accessory gland dysfunction, recurrent urinary and genital tract infections, testicular hyperthermia, drug toxicity or en-

docrine dysfunction due to hormonal alterations^{1,2}. Couples facing this situation still have the opportunity to procreate with the use of prostatic massage, vibratory stimulation, electroejaculation, vasal aspiration or testicular biopsy for sperm retrieval³, in association with intrauterine insemination (IUI), in vitro fertilization (IVF) or intracytoplasmic sperm injection (ICSI). Despite the normal number of spermatozoa found in the semen of SCI men, poor sperm quality is frequently present, especially due to abnormal motility. Nevertheless, an increasing number of paraplegic men have been able to bear a child.

The aim of this study was to evaluate the success of assisted reproductive technology (ART) in terms of successful pregnancy rate, in couples in which men suffer from paraplegia, treated in our unit.

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MATERIAL AND METHODS

A retrospective study was carried out of fifteen couples with SCI men, between July 2005 and July 2010.

RESULTS

Fifteen couples with SCI men were submitted to assisted reproductive technology, with a total of 31 cycles being carried out.

Demographic Data

The etiology for SCI in 14 men was due to traumatic causes (from car crash, diving accident or falling of the roof) and one due to non-traumatic causes (medullar tumor), mainly presenting with spinal lesion below T10. The mean time between the trauma and the beginning of treatment was 7 years. The mean age of men was 35 years (range 22-43yrs). The vast majority of women were healthy, presenting no other causes of infertility. The mean age of women was 32 years (range 25-38yrs).

Sperm Retrieval Technique

In 16 cycles sperm was obtained by electroejaculation and in 14 cycles by testicular biopsy. One couple was submitted to a donor sperm program due to azoospermia in surgical retrieval.

Cryopreservation of Sperm

Cryopreservation of sperm from assisted ejaculation and surgical retrieval was performed in all cases where the diagnostic sample was satisfying in order to avoid another procedure, guarantying the cycle could be carried out. On the day of the oocyte retrieval a fresh sample was collected whenever possible or accepted by the patient.

Of all cycles performed, 13 were carried out with fresh and 18 with cryopreserved sperm samples. In general, fresh samples presented better quality than cryopreserved ones.

TABLE I. NUMBER OF CYCLES CARRIED OUT PER COUPLE

Nº cycles	Nº Couples
1	7
2	2
3	4
4	2

Assisted Reproductive Technique

The assisted reproductive technique was chosen depending on sperm quality on the day of the oocyte retrieval. The majority of semen samples consisted of normal concentrations with asthenozoospermia and therefore five IVF and 26 ICSI cycles were carried out, with no IUI being performed. In the donor cycle an IVF was carried out due to female age (38 years old). A maximum of 4 cycles per couple were done (Table I), with a maximum of 2 embryos being transferred in each cycle. The results of sperm retrieval technique and ART are summarized in Table II.

Pregnancy Rate

Seven of the 15 couples achieved pregnancy (47%), representing a successful pregnancy rate per cycle of 23%. The mean age of women who got pregnant was 31,3 years old in comparison to the others where the mean age was 32,6 years old.

Pregnancy Outcome

One twin and six singleton pregnancies were achieved. Five pregnancies occurred in the fresh sperm sample group (1 assisted ejaculation with IVF, 1 assisted ejaculation with ICSI and 3 testicular biopsies with ICSI) and 2 were obtained from cryopreserved samples (1 assisted ejaculation with IVF and 1 from donor). No major pregnancy complications were registered and all presented with full-term newborns.

DISCUSSION

Although survival and general health issues are the first thoughts when a SCI takes place in young men, it makes sense, nowadays, to think about fertility preservation and the future reproductive desire. Life progno-

TABLE II. THE RESULTS OF SPERM RETRIEVAL TECHNIQUE AND ART

Method	Nº Cycles	Cryopreservation cycles	Clinical Pregnancy
AE IVF	4	3	2
AE ICSI	12	6	1
TB ICSI	14	8	3
Donor IVF	1	1	1

AE – Assisted Ejaculation; TB – Testicular Biopsy

sis for this group of patients has substantially improved in the last few years and therefore we should bear in mind that these men will one day have the desire to start a family.

Although SCI men may suffer from erectile dysfunction, ejaculatory disorder or poor sperm quality, infertility is mainly due to the latter two causes. Some men with erectile dysfunction maintain the ability to ejaculate with self-stimulation (3–20%), although this tends to be unpredictable and in most cases ineffective for pregnancy⁴.

Rectal probe electroejaculation or penile vibratory stimulation are the most used methods for assisted ejaculation. Patients that presented with poor sperm quality or that failed to obtain sperm by at least a couple of attempts with induced ejaculation or due to patient's desire were referred to the Andrologist for evaluation and surgical retrieval. The specimen was immediately examined for the presence of sperm. When no sperm was retrieved, a donor program was suggested.

Each sperm retrieval technique seems to have advantages and disadvantages. Due to technical issues at our centre and keeping in mind the level of the spinal lesion presented, electroejaculation was the most used technique. Although it presents a high success rate, side effects such as pain, injury of rectal mucosa and autonomic dysreflexia might occur. It must be done in a hospital regimen, but is usually well tolerated and sedation/anesthesia is required in only 5% of the cases. In some centers, penile vibratory stimulation is mostly used since it is a less invasive method, preferred by patients, can be used at home, by the patient itself, with no need for medical assistance, and results in less damaged sperm with higher motility^{1,2}. When testicular biopsy is necessary, the efficacy of sperm extraction is expected to be 100%, if azoospermia is not present^{4,5}. Complications of such surgical procedure, as post-operative infections and hematoma, should be kept in mind.

Although it is uncomfortable and expensive to induce ejaculation every time a new cycle is carried out, we believe, as shown by our results, that fresh sperm samples are better when compared to cryopreserved ones. Five pregnancies occurred in the fresh sperm sample group and two were from cryopreserved samples. The main objective is to obtain sperm with the less invasive technique, in order to reduce the risks associated with the most invasive procedures, knowing that there is always the opportunity to obtain it from

testicular biopsy. According to Ohl et al, repeated ejaculations actually seem to improve semen quality⁶. However, it must be kept in mind that unexpected failure of electroejaculation can occur when a patient undergoes ART and therefore the specimen should routinely be cryopreserved if motile sperm is found at the initial examination³. If a very poor sperm sample is obtained, cryopreservation may not be suggested, since motility is further impaired during the process.

As shown by previous studies, our results demonstrate that different sperm retrieval techniques used in paraplegic men, have similar pregnancy outcomes⁸ (3/16 assisted ejaculation; 3/14 testicular biopsy).

In our series, a successful pregnancy rate per cycle of 23% was achieved, including the case with the use of donor sperm. Seven of the 15 couples became pregnant (47%), with one twin and six singletons pregnancies. Although there are some controversies regarding ART and obstetric prognosis, in our data, no major pregnancy complications were registered and all presented with full-term newborns.

CONCLUSION

In couples where men suffer from paraplegia, the goal of fatherhood is nowadays possible, in most cases. As shown by our results, and according to what is described in literature (32–80% pregnancy rate), a high successful pregnancy rate is possible, thanks to the close collaboration between gynecologists, andrologists, embryologists and psychiatrists.

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