

# Intracytoplasmic sperm injection allows normal pregnancy rates for males $\geq 40$ with low hypoosmotic swelling test scores even when complicated by very low motility percentage

J.H. Check<sup>1,2</sup>, A. Tubman<sup>1</sup>, C. Wilson<sup>1</sup>

<sup>1</sup>The University of Medicine and Dentistry of New Jersey, Robert Wood Johnson Medical School at Camden, Cooper Hospital/University Medical Center, Department of Obstetrics and Gynecology, Division of Reproductive Endocrinology & Infertility, Camden, NJ

<sup>2</sup>Cooper Medical School of Rowan University, Department of Obstetrics and Gynecology, Division of Reproductive Endocrinology and Infertility, Camden, NJ (USA)

## Summary

**Purpose:** To determine if the additional burden of low percentage motility reduces the chance that sperm with low hypoosmotic swelling (HOS) test scores will achieve a pregnancy following in vitro fertilization (IVF) with intracytoplasmic sperm injections (ICSI). **Methods:** Couples undergoing IVF-embryo transfer (ET) and ICSI for low HOS tests ( $< 50\%$ ) were retrospectively identified. The percentage motility was divided into deciles. Pregnancy rates were determined according to the deciles of motility. **Results:** No differences in clinical or live delivered pregnancy rates per transfer were found in even the very lowest percent motility category. **Conclusions:** The added complicating factor of low percentage motility added to sperm with low HOS test scores does not reduce the effectiveness of IVF with ICSI.

**Key words:** Hypoosmotic swelling test; Sperm motility; Intracytoplasmic sperm injection; In vitro fertilization-embryo transfer.

## Introduction

Males with sperm with subnormal hypoosmotic swelling (HOS) tests ( $< 50\%$ ) are generally infertile [1]. Interestingly, the abnormality does not prevent fertilization of the oocytes or production of morphologically normal embryos. Instead the defect has been clearly demonstrated to inhibit embryo implantation [2, 3].

The defect seems to be related to a toxic factor that causes impairment to the functional integrity of the sperm membrane which forms the basis of the test to detect this abnormality (impairment of the sperm membrane to allow normal osmosis) [4]. Based on pregnancy rates approaching zero following the transfer of embryos derived from conventional oocyte insemination but normal pregnancy rates with embryos formed by intracytoplasmic sperm injection (ICSI), it is assumed that the etiology for such poor pregnancy rates is the transfer of this toxic factor from sperm to zona pellucida by the supernumerary sperm that attach [5]. A further assumption is that with the incorporation of the zona pellucida into the embryo membrane the toxic factor is transferred to the embryo membrane which impairs its function. A functionally intact embryo membrane is needed for implantation [4].

Some studies have found a correlation of low percent motility and low HOS scores though perfectly normal appearing sperm may also have this defect [6]. The objective of this study was to determine if the sperm of males of more advanced age with low HOS test scores would lead to lower pregnancy rates if complicated by low percentage of motility despite IVF with ICSI.

## Materials and Methods

The study was limited to couples undergoing IVF-embryo transfer (IVF-ET) whose male partner was age 40 or above (higher chance of low HOS test score with male age  $\geq 40$ ). The women were all aged  $\leq 39.9$ . The only couples selected were those where the male partner had an HOS test score  $< 50\%$ .

The clinical and live delivered pregnancy rates were evaluated according to the percent with progressive motility at 10% intervals.

## Results

With motility %  $< 10$ , 10-19, 20-29, 30-39, 40-49, and  $\geq 50\%$ , the clinical pregnancy rates were 33.3% (2/6), 25.0% (2/8), 40.0% (4/10), 17.4% (4/23), 37.5% (6/16), and 42.9% (6/14), respectively.

The live delivered pregnancy rates were 33.3%, 12.5%, 40.0%, 13.0%, 31.3%, and 35.7%, respectively.

## Discussion

The co-existence of sperm with a low HOS test score with very poor motility does not influence pregnancy rates when performing IVF with ICSI as evidenced by the group with the lowest percentage of motility doing as well as the group with normal motility.

## References

- [1] Check J.H., Epstein R., Nowroozi K., Shanis B.S., Wu C.H., Bolland A.: "The hypo osmotic swelling test as a useful adjunct to the semen analysis to predict fertility potential". *Fertil. Steril.*, 1989, 52, 159.
- [2] Check J.H., Stumpo L., Lurie D., Benfer K., Callan C.: "A comparative prospective study using matched samples to determine the influence of subnormal hypo osmotic test scores of spermatozoa on subsequent fertilization and pregnancy rates following in vitro fertilization". *Hum. Reprod.*, 1995, 10, 1197.
- [3] Katsoff D., Check M.L., Check J.H.: "Evidence that sperm with low hypoosmotic swelling scores cause embryo implantation defects". *Arch. Androl.*, 2000, 44, 227.
- [4] Check J.H., Katsoff D., Check M.L.: "Some semen abnormalities may cause infertility by impairing implantation rather than fertilization". *Med. Hypoth.*, 2001, 56, 653.
- [5] Check J.H., Katsoff D., Check M.L., Choe J.K., Swenson K.: "In vitro fertilization with intracytoplasmic sperm injection is an effective therapy for male factor related to subnormal hypo-osmotic swelling test scores". *J. Androl.*, 2001, 22, 261.
- [6] Check M.L., Check J.H., Summers-Chase D., Swenson K., Yuan W.: "An evaluation of the efficacy of in vitro fertilization with intracytoplasmic sperm injection for sperm with low hypoosmotic swelling test scores and poor morphology". *J. Assist. Reprod. Genet.*, 2003, 29, 182.

Address reprint requests to:  
J.H. CHECK, M.D., Ph.D.  
7447 Old York Road  
Melrose Park, PA 19027 (USA)  
e-mail: laurie@ccivf.com

# 18<sup>th</sup> World Congress on Controversies in Obstetrics, Gynecology & Infertility (COGI)

October 24-27, 2013 - Vienna, Austria

---

[www.congressmed.com/cogi](http://www.congressmed.com/cogi)

Free of charge