Men conceived through IVF may inherit father's fertility problems

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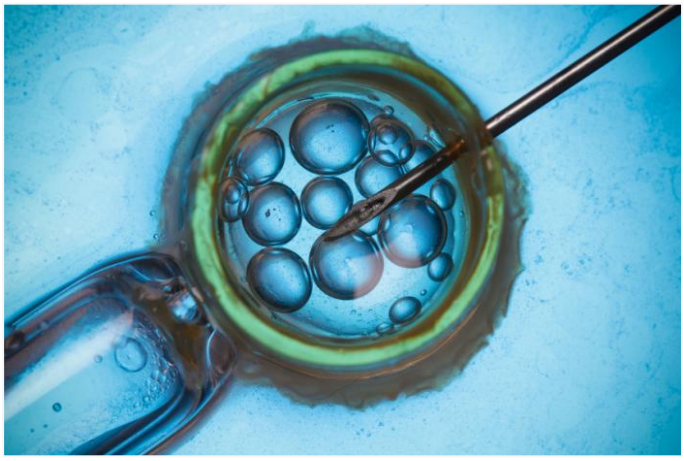
Published: Thursday 6 October 2016

Men conceived through intracytoplasmic sperm injection - a form of fertility treatment - may have poorer sperm quantity and quality than those conceived naturally. This is the conclusion of the first ever analysis of young men who were conceived through the procedure in the early 1990s.

Study co-author Prof. André Van Steirteghemat and colleagues - from the Centre for Reproductive Medicine at the Vrije Universiteit Brussel (VUB) in Belgium - publish their findings in the journal *Human Reproduction*.



Researchers suggest men conceived through ICSI may inherit their father's fertility problems.

Intracytoplasmic sperm injection (ICSI) is a type of assisted reproductive technology. Forming a part of in vitro fertilization (IVF), It involves collecting sperm from the father and injecting it directly into the inner part of the mother's egg, in order to induce normal fertilization. The fertilized egg is then placed in the mother's womb.

ICSI is primarily used to treat male **infertility** - that is, men who have a low sperm count or abnormal sperm function. The technique allows doctors to select the best quality sperm, and injecting it directly into the egg increases the chances of fertilization.

The technique was pioneered more than 20 years ago by Prof. Van Steirteghemat and team. On January 14, 1992, the first baby was born through ICSI.

Since many cases of male infertility are caused by genetic defects, Prof. Van Steirteghemat and colleagues always speculated that men conceived through ICSI might inherit such defects from their fathers.

Now, speculation may have moved closer to fact, after an analysis of 54 men born through ICSI between 1992-1996 - a time when the procedure was solely used for male infertility - suggests an association between the procedure and poor sperm quantity and quality.

Reduction in sperm count, concentration for ICSI-conceived men

The 54 men included in the study - aged 18-22 - were identified through the UZ Brussel hospital database, and they were matched with a group of control men who had been conceived naturally.

Of the men who were conceived through ICSI, 50 of them had fathers who had male-factor infertility (two cases of combined male and female infertility, 48 cases of male infertility only). For parents of the remaining four men, the reason for their infertility was unknown.

All men were asked to provide semen samples, which were assessed for sperm quantity and quality. Blood samples were also collected for analysis, and other health checks were conducted.

The analysis revealed that men conceived through ICSI had almost half the total sperm concentration as men conceived naturally, and they showed a twofold reduction in total sperm count (semen volume multiplied by semen concentration) and total motile sperm count (the number of sperm that can reach the egg).

Furthermore, men conceived through ICSI were found to be three times more likely to have a sperm concentration below 15 million per milliliter and four times more likely to have a total sperm count below 39 million per milliliter.

For reference, the World Health Organization (WHO) consider a normal sperm concentration to be 15 million per milliliter or higher.

The team's findings remained even after accounting for a number of factors that might have impacted semen quality, including age, body mass index (**BMI**), and genital malformations.

Findings suggest 'a degree of sub-fertility has been passed on'

Overall, Prof. Van Steirteghemat and colleagues say their results suggest men conceived through ICSI may have poorer sperm quality and quantity, increasing their likelihood of fertility problems.

"These findings are not unexpected," notes Prof. Van Steirteghemat. "Before ICSI was carried out, prospective parents were informed that it may well be that their sons may have impaired sperm and semen like their fathers. For all the parents, this information was not a reason to abstain from ICSI because, as they said: 'if this happens ICSI can then also be a solution for our sons.'"

> "These first results from the oldest group of ICSI-conceived adults worldwide indicate that a degree of 'sub-fertility' has, indeed, been passed on to sons of fathers who underwent ICSI because of impaired semen characteristics."
>
> *Prof. André Van Steirteghemat*

However, there is no indication that specific semen characteristics can be passed from fathers to sons through ICSI; in the study, the low sperm concentration and total motile sperm counts among ICSI-conceived men did not correlate with those of their fathers.

"The study shows that semen characteristics of ICSI fathers do not predict semen values in their sons. It is well established that genetic factors play a role in male infertility, but many other factors may also interfere. Furthermore, correlation is not the same thing as causation," says Prof. Van Steirteghemat.

Offspring conceived through fertility treatment should be monitored

The researchers stress that their results cannot be generalized to all men conceived through ICSI, as the way the technique is used has changed over the years; nowadays, it is used in most IVF procedures, even when there is no evidence that a couple's infertility is due to the man's poor semen characteristics.

Still, Prof. Van Steirteghemat says the findings emphasize the need for research that monitors the fertility and overall health of offspring conceived using assisted reproduction techniques.

"For instance, paired analysis of samples from fathers and sons should be carried out, and we need to look at larger numbers of offspring," he adds.

"This remains a challenging project for the VUB. However, health authorities and funding agencies should provide the means to answer questions concerning the effects of genetics, mode of conception, fetal growth patterns, and birth weights on the fertility of ICSI men."

Learn how alcohol may influence female fertility.

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Whiteman, Honor. "Men conceived through IVF may inherit father's fertility problems." *Medical News Today*. MediLexicon, Intl., 6 Oct. 2016. Web.
10 Oct. 2016. <http://www.medicalnewstoday.com/articles/313319.php>

APA

Whiteman, H. (2016, October 6). "Men conceived through IVF may inherit father's fertility problems." *Medical News Today*. Retrieved from http://www.medicalnewstoday.com/articles/313319.php.

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