



## Media release - International Federation of Fertility Societies

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### Success of IVF varies with season of the year

The success of an assisted reproduction procedure may depend on the season. This is the finding of new work presented at the World Congress of Fertility and Sterility, in Munich, Germany.

Scientists have long noted that there are seasonal variations in the number of natural human births. No firm explanation has been put forward for this, but speculation is that human reproduction is linked to temperature and season. Now new research indicates that even Assisted Reproduction may be more effective at certain times of year.

A team led by Dr Daniela Braga (Sao Paulo, Brazil) looked at the cytological and biochemical parameters of 1932 patients undergoing egg retrieval for intracytoplasmic sperm injection (ICSI)\*, during different seasons of the year. All patients came from a single fertility center, the Assisted Fertilization Center in Sao Paulo – Brazil.

They looked at 435 patients in winter (representing 22.5% of the total sample), 444 in spring (23.0%), 469 in summer (24.2%), and 584 in autumn (30.3%).

They found that the percentage of developing eggs (MII oocytes), high-quality embryos, implantation, and pregnancy rates did not differ among the groups. Nevertheless the fertilization rate was significantly higher during the spring than during any other season (winter: 67.9; spring: 73.5%, summer: 68.7% and autumn: 69.0%). In fact they report a 1.45-fold increase in the fertilization rate during the spring\*\*.

The team also measured the levels of different hormones, and found that 17- $\beta$  estradiol\*\*\* levels were significantly higher in the spring.

Dr Braga said

*“This work shows that IVF cycles may have a better outcome during the Spring. Our results show a significant difference in spring fertilization rate, with the fertilization rate in the spring being almost one and a half-times that of other seasons. In practical terms this may mean that if you are having real difficulty in conceiving, it may be better to have an assisted reproduction cycle during this season.*

*It is possible that what we are seeing is the effect of changing light on neurons in the brain which produce gonadotrophin-releasing hormones (GnRH). These neurons regulate the secretion of gonadotrophin hormones\*\*\*\*, which in turn control the secretion of estradiol from the ovaries. We found higher 17- $\beta$  estradiol levels in the spring; in assisted reproduction, adequate estradiol levels are important for egg maturation and other reproductive processes including fertilization and embryo development.*

Our next step is to check if there is any difference in the ICSI outcomes in different regions in Brazil. Brazil of course is a very large country, and we have different day lengths in different regions, so we may see differences from region to region depending on the latitude ”.

**ENDS**

**Notes for editors**

This work is being presented during the 20<sup>th</sup> World Congress on Fertility and Sterility, which is taking place in Munich from 12-16 September, <http://www.iffs2010.com/>

The World Congress on Fertility and Sterility is organised by the International Federation of Fertility Societies (IFFS), which represents national fertility societies from all parts of the world. We have more than 70 member societies from all parts of the World. The IFFS website is <http://www.iffs-reproduction.org/>. The next World Congress will take place in Boston in 2013. We can assist with press comment on any assisted reproduction matters, especially in an international context.

**PLEASE MENTION THE WORLD CONGRESS ON FERTILITY AND STERILITY OR THE IFFS IN ANY STORY**

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\*IntraCyttoplasmic Sperm Injection (ICSI) is a procedure in which sperm is injected into the oocyte (egg) cytoplasm.

\*\*The team used logistic regression analysis to test the influence of the season (spring) in the results. These analyses produced an Odds Ratio of 1.45. For comparison, an Odds Ratio of 1 means there is no effect of the variable being analyzed, whereas in this case the OR of 1.45 means there is an almost one and a half times increase in chance of fertilization.

\*\*\*17- $\beta$  estradiol is the main estrogen found in women between the ages of puberty and menopause.

\*\*\*\* Gonadotrophins are protein hormones secreted by the pituitary gland (at the base of the brain).

**Abstract**

**The effect of the season on human assisted reproduction outcomes**

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**Introduction:** Epidemiologists have demonstrated a seasonal distribution in human natural conception and birth rates. Temperatures and seasons have been suggested as environmental factors that influence fecundity in mammals. The present study evaluated whether seasonality affects human assisted reproduction treatments outcomes.

**Materials & methods:** For this study 1932 patients undergoing oocyte retrieval for intracytoplasmic sperm injection (ICSI) were assigned to a season group according to the day of oocyte retrieval: winter (n=435, 22.5%), spring (n=444, 23.0%), summer (n=469, 24.2%) and autumn (n=584 30.3%). The percentage of retrieved metaphase II (MII) oocytes and high-quality embryos, fertilization, implantation and pregnancy rates were compared among the groups. Moreover the serum estradiol concentration was compared and, in order to identify the effectiveness of the ovarian response, the estradiol concentration per number of MII oocytes was also evaluated.

**Results:** The percentage of MII oocytes, high-quality embryos, implantation, and pregnancy rates did not differ among the groups. Nevertheless the fertilization rate was significantly higher during the spring than at any other season (winter: 67.9; spring: 73.5%, summer: 68.7% and autumn: 69.0%,  $P < 0.01$ ). In fact a nearly one and a half-fold increase in the fertilization rate during the spring was noted (OR: 1.45,  $P < 0.01$ ). No influence of any other season on the fertilization and percentage of high-quality embryos was noted. The serum estradiol was equal among the groups, however, the estradiol concentration per number of MII retrieved oocytes was significantly higher during the spring (winter: 235.8; spring: 282.1, summer: 226.1 and autumn: 228.7,  $P=0.030$ ).