Researchers develop a method to select eggs with the best chance of leading to successful pregnancy

12 March 2008

A research team supervised by Université Laval scientist Marc-André Sirard has identified genetic markers that allow the selection of eggs with the best chance of leading to successful pregnancy after in vitro fertilization (IVF). This finding could both increase the success rate of single embryo transfer and diminish the risk of multiple pregnancies. The details of the method developed by the researchers, for which an international patent application has been filed, are explained on the website of the scientific journal *Human Reproduction*.

Eggs recovered in the course of the IVF process are surrounded by follicular cells that are removed before the actual fertilization procedure begins. “While in the ovaries, these cells and the eggs are in very close interaction,” explains Sirard. “A first experiment we conducted on bovine follicular cells led us to believe that these cells might possess specific markers that would be able to give us information about the quality of an egg.”

With the help of 40 women recruited in a fertility clinic, researchers compared follicular cells surrounding eggs that ultimately led to successful pregnancies—i.e. “good” eggs—to cells surrounding ovules that did not result in pregnancy. This comparison led to the identification of five genes expressed more abundantly in follicular cells surrounding good eggs.

Currently, the way to assess which embryos are to be transferred into a woman’s uterus is based on visible criteria such as appearance and division rate. “At least 30% of embryos that look normal through visual examination nonetheless show chromosome abnormalities,” explains Professor Sirard, illustrating the limits of this type of assessment. The method developed by Sirard’s team makes it possible to objectively select ovules that have the best chance of success without altering the integrity of the embryos.

This new genomic tool could also solve an ethical problem confronting both fertility clinic doctors and the people who consult them: In order to increase the chances of pregnancy, many embryos are implanted simultaneously into the woman in the hope that at least one will survive. This procedure along with improved IVF techniques has led to an increase in multiple pregnancies.

Even if doctors now tend to transfer fewer embryos, multiple pregnancies still occur in 30% of couples who resort to IVF in North America and 23% in European couples. “By selecting the embryo with the best potential, it would be possible to limit the number of embryos transferred, and thus the number of multiple pregnancies, while maintaining good success rates,” concludes Marc-André Sirard.

Source: Université Laval