Medical Xpress

First IVF babies born using new chromosome counting technique

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The first babies have now been born in the UK using a new technique pioneered at Oxford University to select the best embryos for IVF.

The advance could bring hope to many British couples struggling to have a child and going through many cycles of IVF treatment.

George and Helen Ashton from Gloucestershire are thought to be the first couple to have babies in the UK after using a technique called microarray CGH with IVF embryos five days after fertilization.

The technique allows the embryos to be checked for the right number of chromosomes before implantation in an IVF treatment, lessening the chance of miscarriage or Down's syndrome.

The Ashtons had twins last November following treatment at the Oxford Fertility Unit, an independent IVF clinic which maintains strong research partnerships with the University. The boys, Alex and Louis, are now 11 weeks old.

The strategy of applying microarray CGH, or comparative genomic hybridisation, to five-day-old embryos, or 'blastocysts', was developed by Dr. Dagan Wells and Dr. Elpida Fragouli at the University of Oxford, with funding from the Oxford Biomedical Research Centre and in collaboration with partners in the health services and industry.

"If a sperm and egg come together and produce an embryo with the

wrong number of chromosomes, the embryo will usually fail to establish a pregnancy or miscarry," explains Dr. Dagan Wells of the Nuffield Department of Obstetrics and Gynaecology.

As with routine IVF treatment, several eggs are produced and fertilized. Five days later at the blastocyst stage, a small number of cells are removed from the growing embryo and microarray CGH is used to check for any significant abnormalities present in the chromosomes. In effect it scans the DNA packed up in the cells' chromosomes for any clear problems. Results are available 24 hours later.

Based on this information, it is possible to make sure that only embryos with the correct number of chromosomes are transferred in IVF, improving pregnancy rates as a result.

The Ashtons had first tried IVF in 2004 and had had five unsuccessful IVF cycles. They were told that it was probably down to bad luck and poor embryo selection, so the couple went to the Oxford Fertility Unit and had their embryos tested using microarray CGH.

"We were of the opinion that this was going to be our last go," Mr Ashton said. "Array CGH has been a godsend to us – but the big issue is that not many people know about it."

There have been other couples who have given birth to babies after receiving this treatment in Oxford, and a couple from Lancashire had a baby shortly after Christmas after opting for a closely related technique at a Manchester clinic.

Tim Child, director of the Oxford Fertility Unit and a senior fellow at the Nuffield Department of Obstetrics and Gynaecology at Oxford University, said: 'We are proud that Oxford Fertility Unit was the first clinic in the UK to use blastocyst chromosome screening successfully.

We have a number of couples who have already given birth to babies using this method and we look forward to helping many more.'

An ongoing study by Dr. Wells and colleagues, part of which was published in the journal *Fertility and Sterility* last year, has revealed that pregnancy rates after chromosome testing were increased by more than 50% in a group of 200 American patients undergoing IVF treatment. Other studies by the Oxford University group have shown microarray CGH has an accuracy of greater than 95% for detecting abnormal embryos.

Dr. Wells says: "For IVF treatment there are two problems. Firstly, many of the embryos produced in a typical IVF cycle have the wrong number of chromosomes or significant chunks of DNA missing or duplicated. Secondly, the usual assessments done in an IVF clinic, which involve looking at embryos under the microscope to see how they are growing, cannot distinguish embryos with lethal chromosome problems from those that are healthy.

"The method we have developed allows us to identify which embryos have the correct number of chromosomes. These embryos should have the best chance of producing a baby and the lowest chances of miscarrying or having Down's syndrome.'

Dr. Wells does caution that a randomized clinical trial is necessary to be able to say exactly how much benefit microarray CGH provides in reducing the risk of miscarriage and Down syndrome and in improving IVF success rates, and further clinical studies are needed to reveal which patients will benefit the most. There is evidence, however, that couples who have experienced several miscarriages may benefit from this type of testing.

The technique is available now – a company Reprogenetics now provides

the test to multiple IVF clinics in the UK – but adds an extra £2,000 on top of the cost of an IVF cycle. The hope is that new innovations being developed at the University of Oxford will lower prices further in the near future.

"In the long run, this could actually save the NHS money,' says Dr. Wells, "as well as reduce the emotional and physical stresses suffered by couples who often have to undergo multiple cycles of IVF treatment in order to have a child."

Stephen Kennedy, head of the Nuffield Department of Obstetrics and Gynaecology at Oxford University and clinical director of women's services at the Oxford Radcliffe Hospitals NHS Trust, says: 'This is a perfect example of how patients are benefitting from the unique collaborative partnership between the University, Oxford Fertility Unit and the Oxford Biomedical Research Center in translational research, without which it would be difficult to introduce new scientific advances into clinical practice.'

Provided by Oxford University

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