Full chromosome screening of embryos using new 24sure analysis

Concept Fertility Centre

12.2.13

Growing evidence suggests that a major factor in the failure to establish or maintain a pregnancy is when the cells in the embryo contain the wrong number of chromosomes, a condition termed aneuploidy. It has been known for some time that a significant number of human embryos have the wrong number of chromosomes (aneuploid). It is normal for a cell to contain 22 pairs of chromosomes plus the sex chromosomes, either XX for females or XY for males. Problems can arise when the embryo's cells contain too many or too few chromosomes.

A new test called 24sure is the first using new array technology that enables scientists to screen for aneuploidy in developing embryos and confirm that the correct number of all the chromosomes are present in each embryo. Many researchers believe this should increase the likelihood of an embryo transferred during IVF treatment resulting in a successful pregnancy.

What is 24sure?

24sure is a test that takes advantage of technology known as array comparative genomic hybridization (aCGH) and is a unique test because it makes thousands of independent measurements of the chromosomes at the molecular level.

This is believed to be more accurate than previous techniques such as Florescent In Situ Hydridization (FISH) which relied on a limited number of measurements on a restricted number (9 of the 24 chromosomes) of chromosomes examined under a microscope.

24sure is automated and objective which ensures a high degree of confidence may be placed in the results. Screening with 24sure can be completed in as little as 12 hours and therefore does not impact on the scheduling of an embryo transfer procedure in a fresh IVF cycle.

The impact of 24sure on live birth rate is the subject of a number of ongoing studies. Preliminary studies have shown promising results and trials are continuing.

Validation of 24sure aCGH

24sure aCGH was initially validated in 2009 in Cambridge UK and is now used in over 60 laboratories worldwide.

Recent validation studies show that 24Sure aCGH gives a 98% accuracy rate and results for 97% of the embryos tested. There have been numerous studies done to validate 24sure aCGH and these can be found on the website > www.24suretest.com <.

Advantages of 24sure aCGH over previous technology (FISH)

- Analysis the all of the chromosomes rather than 9 as tested with FISH
- More accurate results– 98% vs 90-94% with FISH
- Results more reliable than FISH
- Fully automated analysis so not reliant on operator interpretation
- More embryos with a result

Who might benefit from 24sure aCGH?

- Those who are over 35
- Those who have a history of miscarriage
- Those who have had 3 or more IVF cycles without success
- Those who have a family history of aneuploidy

How does embryo screening with 24sure work?

- Egg collection and ICSI
- Embryo biopsy – removing a cell from each embryo on day 3 of development
- 24sure analysis
- Embryo transfer on day 5 of development
- Freezing of surplus embryos with correct chromosome number

Figure 1

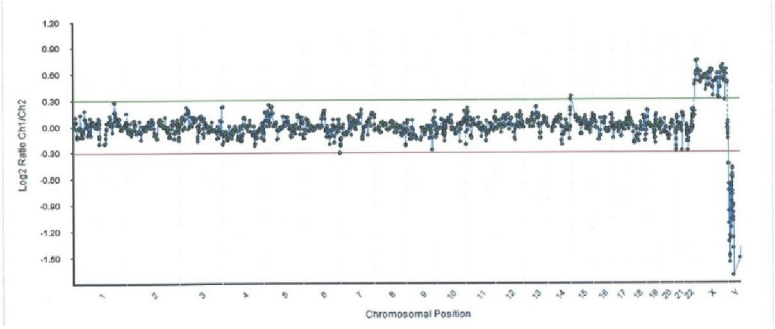

Figure 1 is an image of a 24sure analysis showing results from an embryo with the correct number of chromosomes. In this case there are two copies of each chromosome except the Y chromosome which is missing (image from Fishel et al J Fertiliz In Vitro 2011).

Figure 2

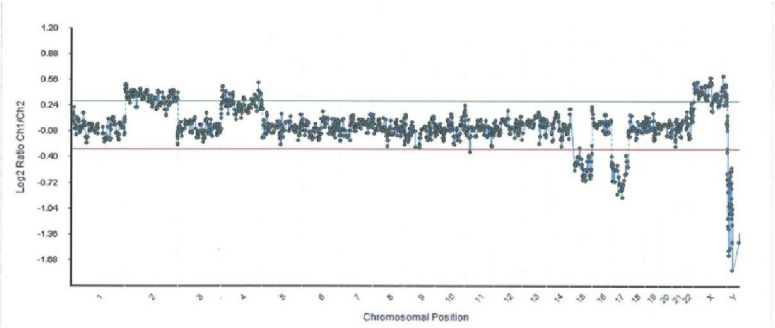

Figure 2 is an image of a 24sure analysis showing results from an embryo with extra chromosomes 2 and 4 and a 15 and 17 chromosome missing (image from Fishel et al J Fertiliz In Vitro 2011).

Benefits of full chromosome screening?

The validation studies done to date indicate that errors in the number of all the chromosomes can occur in human embryos. Some of these errors (15-20%) could not be identified using the 9 chromosome FISH testing. Importantly, it has been shown that embryos with chromosome errors not identified by the standard 9 chromosome FISH testing can progress to the blastocyst stage of development.

For more information please see the Preimplantation Genetic Testing information sheet or contact the Scientific Director at Concept on 9382 2388.

Contact Us

218 Nicholson Road

Subiaco WA 6008

Telephone: (08) 9382 2388

Facsimile: (08) 9381 3603

concept@conceptfertility.com.au

www.conceptfertility.com.au