

## **CASE STUDY** A modified embryo cryopreservation method

Drs Suresh Kattera and Christopher Chen have developed **methods to increase the post-thaw survival of frozen embryos** with a concomitant increase in implantation. The results were announced in *Fertility and Sterility* in November 2005.

In summary, the study aimed to improve the outcome of frozen ET cycles, and the authors attempted to modify the various steps of the cryopreservation protocol. In a pilot study on arrested and fragmented embryos (grades 3 and 4), they achieved post-thaw survival rates of 80% and 65%, respectively, having all blastomeres intact after making their modifications to the various steps of the standard method. Encouraged by the post-thaw survival outcomes of these embryos, they used this modified method in a routine clinical frozen ET program. The report goes on to describe the improvements of the modified method, in comparison to the 'standard' methods many laboratories employ.

In the study one hundred and forty-five patients had embryos frozen and thawed according to the 'standard' method, and fifty six patients had embryos frozen and thawed according to a modified method. In the outcome the modified method resulted in 138 (93%) of the 149 embryos thawed for 56 patients surviving freezing, with 79.8% of all blastomeres intact, which is almost double the result obtained (41.8%) for patients whose embryos were thawed with the standard method. The implantation and pregnancy rates were also significantly higher with the modified method compared with the standard method.

After describing the results, the authors state that it is difficult to exactly pinpoint whether the improvement in post-thaw survival was due to the improved freezing or thawing protocol. However, the improvement could be attributed mainly to changes made to both the freezing and thawing protocols, particularly the loading of embryos into the straws and the warming rates at room temperature. It has been reported that the highest implantation and pregnancy rates come from embryos with all their blastomeres intact (14). Thus, it is important to achieve 100% survival of blastomeres in the maximum number of embryos, which in turn results in higher implantation and pregnancy rates. The results reported confirm this. The authors claim this was the **first report of high post-thaw embryo survival after modification of the standard method**. The authors go on to say that proper study design would have been a prospectively randomized study, with half of the cycles or half of the embryos per cycle frozen with the standard and half with the modified protocol. However, the differences in post-thaw survival were such that a prospective randomized study was unethical.