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Oocyte and blastocyst survival rates following implementation of the Cryotec® vitrification method

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INTRODUCTION:
Since the first successful cryopreservation of human embryos in the early 1980s the cryopreservation of the various developmental stages of human embryos has become a routine part of assisted conception treatment in many centres. Cryopreservation of gametes has also made fertility preservation possible for both men and women and it is thus imperative that survival is maximized and cell structure and function are optimally maintained. Oocytes and embryos can be cryopreserved by either slow freezing or the more recently introduced technique of vitrification. The Cryotec® vitrification method was introduced to our Centre during September 2014. In this retrospective analysis the success of the Cryotec® method on oocyte and blastocyst survival rate after warming has been investigated to determine the reliability of the technique.

AIM:
To investigate oocyte and blastocyst survival rates using the Cryotec® method.

MATERIALS AND METHODS:
Patients were stimulated according to our Centre's usual clinical practices. Oocytes were retrieved by transvaginal ultrasound-guided aspiration 36 h post-trigger and either (a) vitrified after enzymatic denudation 3 h post-aspiration or (b) inseminated by IVF or ICSI and cultured for 5 days until blastocysts were transferred and/or vitrified. Oocytes or blastocysts were vitrified using the 2-step Cryotech® protocol and warmed using the Cryotec® 4-step warming protocol exactly as per the manufacturer's instructions (Cryotech, Tokyo, Japan).

RESULTS:
During the 9 month period between September 2014 and May 2015 a total number of 1624 blastocysts and 940 oocytes were vitrified. The average survival rates after warming were 87.8% and 83.8% for blastocysts and oocytes respectively, although there were appreciable variations month-to-month: 80% –98% for blastocysts and 63% –100% for oocytes. Especially for blastocysts the success rates in more recent months were significantly higher than the earlier months, indicating the benefit of experience using the technique (93% v 81%, $P<0.0001$). The pregnancy and implantation rates for warmed blastocyst transfer cycles were 46.3% and 26.8% respectively. For our vitrified and warmed oocytes the fertilization and blastocyst formation rates were 55.8% and 49.2%, and the pregnancy and implantation rates were 55.8% and 39.8%.

CONCLUSION/DISCUSSION:
Cryopreservation of embryos and, nowadays, also oocytes plays a significant role in maximizing the efficiency of an IVF cycle. Based on our first 9 months experience with the Cryotec® vitrification methodology, during which large numbers of oocytes and blastocysts were vitrified per month, we found the technique to be fast, safe and very reliable, although there was a clear benefit of operator experience. The survival rates with the Cryotec® method for both oocytes and blastocysts were similar (83.7% and 87.7% respectively) and comparable to those reported in various other studies. Pregnancy rates of 46.3% and 55.8% for FETs and warmed oocytes respectively, are high when compared to other studies with pregnancy rates ranging between 30 and 40%. The high cryosurvival, blastocyst formation and pregnancy rates indicate that the Cryotec® method is a superior method in the field of assisted reproductive technology (ART).