

国際医療福祉大学審査学位論文（博士）

平成26年度大学院医療福祉学研究科博士課程・論文発表会抄録

題目：Efficiency of a Closed Vitrification System
with Oocytes and Blastocysts

保健医療学専攻・生殖補助医療胚培養分野・生殖補助医療胚培養領域

氏名：井上 太

キーワード：Vitrification, Closed system, Cryopreservation, Oocyte, Blastocyst

Cryopreservation has now become one of the important routine treatments in reproductive medicine. Closed system vitrification decrease the risk of cross-contamination, because it vitrifies and cryopreserve oocytes and embryos without direct contact with liquid nitrogen ¹⁾. However, open system vitrification is the major practical system ²⁾. This study evaluated the efficacy of a closed system with the newly developed CryotopCL in comparison with open system Cryotop.

Vitrification and thawing media with Hydroxypropyl cellulose ³⁾ was used. During vitrification process and during storage, CryotopCL had no direct contact with liquid nitrogen while Cryotop open system had direct contact with liquid nitrogen.

In experiment 1, mouse oocytes were divided into closed and open vitrification groups to compare survival rate. Subsequently, embryo development was evaluated. In experiment 2, mouse blastocysts were compared of their survival rate. In clinical trial 1 and 2, human oocytes and blastocysts were used to compare the two system

likewise in experiment 1 and 2. In clinical trial 3, vitrified-warmed blastocysts were transferred to patients to observe implantation and pregnancy rates.

The survival rate with mouse oocytes was 96.7% vs. 100%, blastocyst formation rate was 75.5% vs. 75.9%, and survival rate with mouse embryos were both 100% for the closed and open systems. The survival rate of human oocytes was 93.9% vs. 97.0% and embryo development rate was 72.0% vs. 66.7%. The survival rate of human embryos was 98.4% vs. 98.3%. Clinical outcome showed no significant difference in the implantation rate, 49.1% vs. 48.0% and ongoing pregnancy rate 45.5% vs. 42.0%.

This study indicates that closed system vitrification with CryotopCL is suitable for laboratory and clinical work. It is suggested that the closed system can be put into practical use as an efficient vitrification technique in assisted reproduction technologies.

References

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