MOUSE MODEL VALIDATION OF A SHORTENED NON-EQUILIBRATION BLASTOCYST VITRIFICATION PROTOCOL DEMONSTRATES COMPATIBILITY WITH OPEN AND CLOSED VITRIFICATION DEVICES

A. GIOVANNINI [1], P. DAMIANI [1], C. LYNCH[1], J. RODRIQUEZ QUESADA[1], R. VASSENA [1]

1. CooperSurgical, Inc., CT, USA.

CooperSurgical® | Medical Affairs

OBJECTIVE

To assess the impact of vitrification devices – open or closed – on embryological outcomes in mouse blastocysts vitrified using a non-equilibration protocol.

MATERIALS AND METHODS

B6C3F1 hybrid mice were super-ovulated with PMSG and hCG, mated, and 1-cell embryos collected 18–20 hours later. Eight experimental groups (n=75 blastocysts/group) were established using combinations of traditional (S) or non-equilibration (F) vitrification, multi-step (S) or single-step (F) warming, and open (O) or closed (C) vitrification devices (VitriGuard™/VitriFit™, CooperSurgical, USA). All procedures were conducted using SAGE™ vitrification and warming kits. Group S/S represented the current standard-of-care control.

Embryos were cultured in global™ total™ medium (CooperSurgical, USA) and assessed for morphology and expansion at 2 and 24 hours post-warming. Total and apoptotic cell counts were evaluated using Hoechst 33342 and TUNEL staining. Statistical analysis was performed using Fisher's exact tests.

CONTACT INFORMATION

Alexa Giovannini, Associate Medical Science Liaison
Alexa.giovannini@coopersurgical.com

RESULTS

Overall blastocyst survival was 99.3% (596/600), 99.0% in the open device and 99.7% in the closed device, with no significant differences between open and closed devices, between protocol combinations, or compared with standard of care (p>0.05).

At 24 hours, all surviving blastocysts were expanded or hatching, with no device-related differences. Apoptotic cell counts were comparable between devices in most groups; however, in the S/F group, closed devices demonstrated lower apoptotic cell counts compared with open devices (5.44±2.65 vs 7.39±1.89, p<0.001).

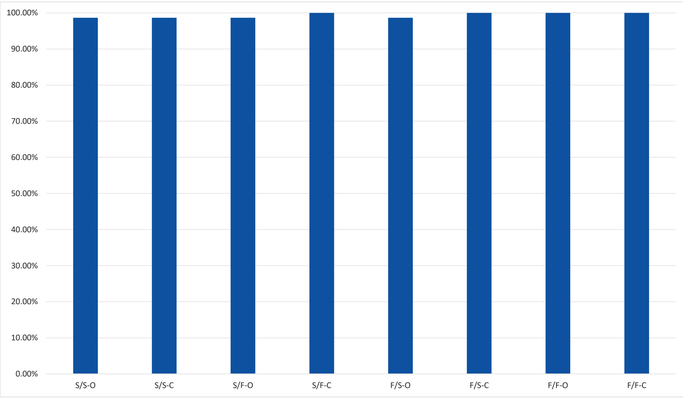

Figure 1: Survival rates across groups.

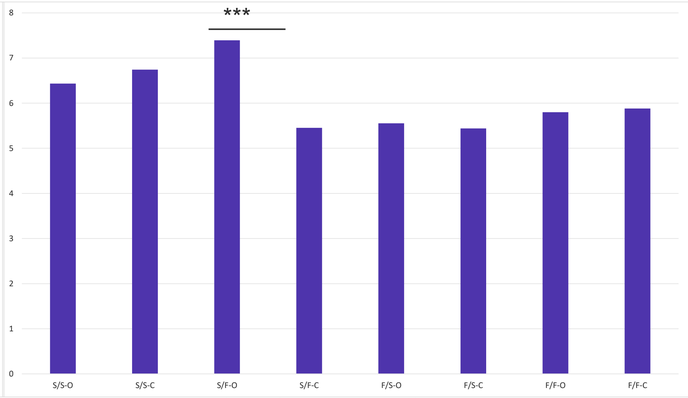

Figure 2: Number of apoptotic cells across groups

CONCLUSIONS

These data demonstrate that short non-equilibration vitrification protocols are compatible with both open and closed vitrification systems, supporting workflow efficiencies without compromising embryological outcomes. Further investigation is warranted to confirm findings related to apoptotic cell differences.

This study was performed by CooperSurgical Inc.