

Resulting Success of Early Introduction to a Low Lactate Continuous Embryo Culture Medium Versus a Higher Lactate Sequential System

A. Brewer¹, C. Guerrero¹, L. VerMilyea²

¹Arizona Reproductive Medicine Specialists, Phoenix, AZ, USA

²FUJIFILM Irvine Scientific, Santa Ana, CA, USA

Background

It has been shown that a low lactate embryo culture medium provides a beneficial environment for embryo development with higher degrees of euploidy. Recently, reduced miscarriage rates have been reported as well as reduced abnormal fertilization results, indicating that the timing of introduction to low lactate may have a significant role in the status of the resulting blastocyst.

Objective

To determine if a 1mM lactate embryo culture environment introduced at the earliest stages of culture provides any benefit to the resulting blastocyst or clinical pregnancy outcome when compared to an embryo culture medium containing a higher concentration of lactate.

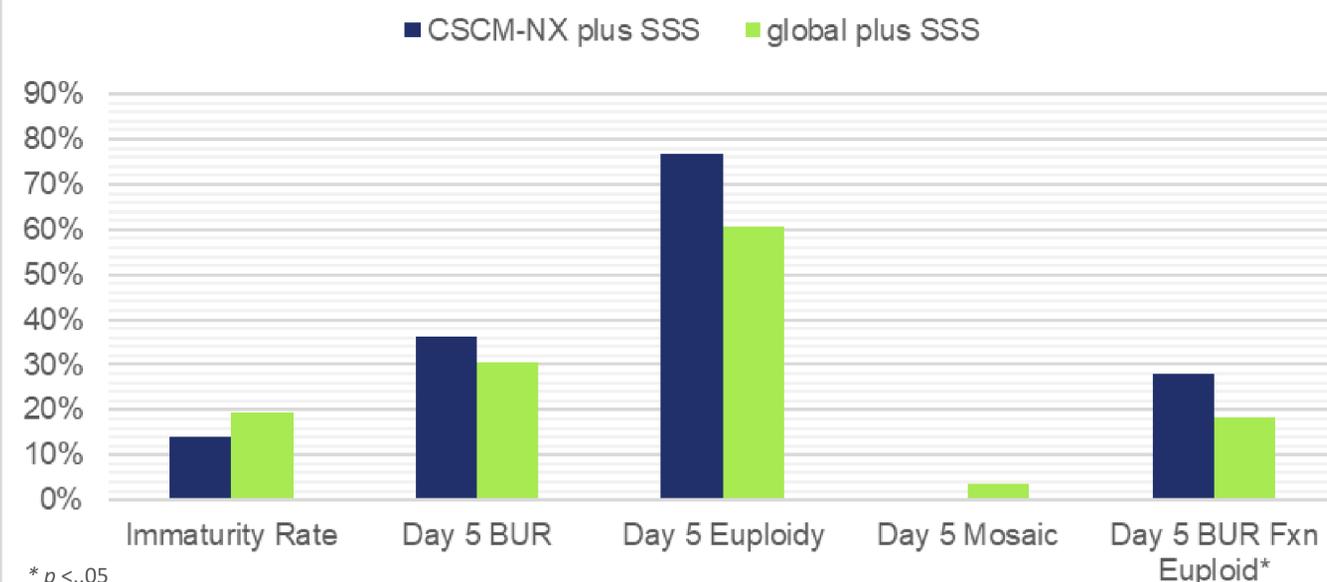
Materials and Methods

A prospective split sibling cohort study, beginning directly after completion of retrieval, and continuing through day 6 of embryo culture was conducted on 30 consecutive patients. Patients with 8 or more oocytes retrieved had their oocytes evenly distributed between Continuous Single Culture Medium-NX and global, both with 10% SSS supplementation, prior to being placed into the incubator after retrieval and immediate denudation. No consideration was given to the patient age, stimulation protocol, or clinical indication, nor was oocyte maturity assessed prior to separation. ICSI was performed on all mature oocytes in MHM with 10% SSS supplementation.

Results

Statistical analysis was assessed via Chi Square. Abnormal fertilization rates were similar amongst low lactate (1.7%) and global (1.9%), as were 2PN rates (79.5%, 78.0%). The immaturity rate was 13.9% in low lactate and 19.0% in global ($p < .10$). Day 5 BUR was higher in low lactate (36.3%) versus global (30.5%). Day 5 euploidy in low lactate was 76.9% compared to 60.7%. BUR as a function of chromosomal status shows low lactate (27.9%) over global (18.5%) ($p < .05$). Overall, low lactate had a higher BUR than global (68.1% and 66.5%) and a higher euploidy rate (66.2% and 54.0%). Low lactate also had a reduction in overall mosaicism (1.4% vs 6.3%). The clinical pregnancy rate in low lactate is 71.4% and 66.7% in global.

CSCM-NX versus global (SSS Supplementation)



Conclusion

The data supports the use of a culture medium containing low lactate from the earliest onset of embryo culture. The finding of a statistical significant improvement of immaturity rates in low lactate needs more exploration.