

Effect of retinoic acid on the inner cell mass in mouse blastocysts**Huang F.J, Hsuuw Y.D, Chang S.Y, Kang H.Y, Huang K.E.**

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INTRODUCTION: To extend our understanding about the selective effect of RA on inner cell mass (ICM) development in the blastocysts, we will examine the effect of RA on cell proliferation, as well as the cell-killing effect of the RA on ICM cells.

METHODS:

DESIGN: Prospective, controlled study.

SETTING: Center for Reproductive Medicine.

SUBJECTS: Blastocysts from outbred ICR mice

INTERVENTIONS: Hyperstimulation protocol, blastocysts were collected and the ICM were isolated by immunosurgery; then using the hanging drop culture, ICMs in aliquots of 10 μ l CMRL-1066 medium containing one ICM, in the presence of 0, 10^{-7} , 10^{-5} M of all-trans retinoic acid (RA) for 24 hours.

MAIN OUTCOME MEASURES(S): The cell proliferation and cell death of ICM were detected by the dual staining, TUNEL and Annexin-V staining respectively.

RESULTS: Mouse ICMs were exposed for 24 h to doses of 0.1 μ mol/l and 10 μ mol/l of all-trans retinoic acid. Compared with the findings for the control blastocysts, exposure to retinoic acid resulted in a significant reduction in the average number of total cells (93.1 ± 34.2 vs. 77.3 ± 34.1 vs. 62.8 ± 30.3 ; $P < 0.001$). The effect was associated with a significant increase in the number of cell deaths identified as engaged in apoptosis by means of the TUNEL and Annexin-V techniques (1.3 ± 1.2 vs. 2.2 ± 1.7 vs. 2.7 ± 1.7 ; $P < 0.001$).

CONCLUSIONS: This study is the first to show that RA-induced cell death (apoptosis) occurs in the ICM of blastocysts and this can result in subsequent inhibition of cell proliferation of ICM.