The effects of Matrigel on the developmental processes of mouse blastocysts

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Abstract

Introduction: Culturing embryos on Matrigel™, is one of the most suitable methods for studying in vitro embryonic developments. As Matrigel has not been used extensively in different species for embryonic development studies, this study was undertaken to determine the effects of Matrigel on the developmental processes of mouse blastocysts.

Materials & Methods: To a number of female NMRI mice, hMG and HCG injections were made for ovulatory stimulation and then they mated with males from the same strain. Later on, blastocysts were obtained and randomly divided into 2 groups: 150 case blastocysts and 134 control blastocysts. Blastocysts were cultured for 48 hours in M16 medium, supplemented with 4*mg/ml* of bovine serum albumin (BSA). Later, the blastocysts were compared with the blastocysts cultured in Matrigel plus the same medium. Developmental studies were carried out every 24 hours for 2 days. The data was analyzed by SPSS software and the results were tested by chi-squared.

Results: After 24 hours, a significantly higher ratio of embryos reached the hatched blastocysts stage I in the case group (74%), compared with that of the control group (52.2%), ($p<0.05$). At the same time the percentage of fragmented blastocysts in the control group was 11.9% which was significantly higher than the case group (2%), ($p<0.05$). After 48 hours, 41% of blastocysts cultured in the control medium, developed to stage I, the value being significantly more than the blastocysts in the case group ($p<0.05$). Moreover, after the same period of time (48 hours), the percentage of stage II hatched blastocysts in the case group (79%) was higher than the control groups (59%), ($p<0.05$).

Conclusion: Matrigel use in enriched culture media can increase development and growth of mouse blastocysts. It also seems that ultrastructural studies of cultured embryos or immunocytochemical studies from this regard would be beneficial in understanding the processes involved.

Key Words: Blastocyst, Culture media, Matrigel, Embryo development, Laboratory mouse.

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