

COMPETITIVE STUDY BETWEEN HUMAN MESENCHYMAL STEM CELLS DERIVED FROM EUTOPIC AND ECTOPIC ENDOMETRIUM

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Purpose: Endometriosis is the disease of endometrial tissue growth outside the uterine cavity. It affects women during the reproductive years and may cause chronic pelvic pain, dysmenorrhea, dyspareunia and infertility. Endometrial cells are similar to stem cell characters which show strong capable of reproduction, included endometriosis formation. In this study, ectopic endometrial mesenchymal stem cells (EN-MSCs) were compared with eutopic EN-MSCs to clarify the contribution in pathogenesis of endometriosis.

Materials and methods: Human eutopic and ectopic EN-MSCs were isolated from a woman with endometrioma. These cells were identified by flowcytometry. The proliferation potential was measured by population doubling level and colony-forming efficiency. The characterization of stem cells was demonstrated by gap junctional intercellular communication. Multilineage differentiation ability was determined by Oil red O staining, von Kossa staining, Alcian blue staining and immunostaining.

Results: In this study, human eutopic and ectopic EN-MSCs were isolated from a woman with endometrioma. They all expressed the capable of differentiation into mesodermal lineages (i.e. adipocytes, osteoblasts and chondrocytes), transdifferentiation into ectodermal lineage (i.e. neural cells) and endodermal lineage (cardiomyocytes). Eutopic and ectopic EN-MSCs are deficient in GJIC. CD9, CD29, CD44, CD90, CD105 and CD49f which are specifically expressed in MSCs, have also expressed in eutopic and ectopic EN-MSCs. Ectopic EN-MSCs highly expressed Oct-4 and Notch 1 than eutopic EN-MSCs. The different expression of Notch 1 between eutopic and ectopic EN-MSCs was also reflected in the cell growth rate. The growth rate of ectopic EN-MSCs was also significant higher than that eutopic EN-MSCs. Clonogenicity has been shown to be characteristics of stem cells and were evaluate cell growth potential. The colony formation unit was no difference between ectopic and eutopic EN-MSCs. However, the colony size of eutopic EN-MSCs were significant larger than ectopic EN-MSCs.

Conclusion: These results demonstrated that EN-MSCs from eutopic and ectopic endometrium showed the characteristics of stem cells. However, there was difference between eutopic and ectopic EN-MSCs in the growth potential. These results will be an essential tool for the resolution of these controversial questions of endometriosis and open up an avenue for more detailed understanding of endometrial stem cells and tumor biology.