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MicroRNA-199a regulates human eutopic and ectopic endometrial mesenchymal stem cells

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Endometriosis, defined as the presence and growth of functional endometrial tissues outside the uterine cavity, is a common benign gynecological disease that affects 10-15% of reproductive aged women. The pathophysiology of endometriosis is not clearly understood. MicroRNAs (miRNAs) are small (19 to 25 nts) endogenous non-coding RNA molecules that post-transcriptionally regulate gene expression. In previously study, we found cox2 played a role in the pathogenesis in the endometriosis. We predicted microRNA-199a is the upregulator of cox2. Further study of the role of microRNA in the development of endometriosis is investigated by using eutopic and ectopic endometrial mesenchymal stem cells.

First, we assessed the microRNA-199a expression level by real-time PCR in human serum of women with (n=58) and without (n=27) endometriosis. The data showed that the microRNA-199a expression was significantly higher in endometriosis compare to those without endometriosis. The microRNA-199a expression in endometrial mesenchymal stem cells (MSCs) of eutopic and ectopic from the same endometrial donor was investigated. Further,we identify the biofunction of microRNA on cell migration, invasion and proliferation by wound healing assay, Matrigel invasion assay, and XTT assay, respectively, in endometrial MSCs. Silencing of microRNA-199a in ectopic endometrial MSCs led to decreased cell migration, invasion and proliferation. In addition to, introducing the microRNA-199a into the eutopic endometrial MSCs could increase cell motility and growth. These data indicated that the microRNA-199a has significant effect on endometriosis progression.

Our study revealed the serum microRNA-199a levels were significantly higher in the endometriosis cases. The expression levels of the microRNA-199a were related to cell motility and growth in eutopic and ectopic endometrial MSCs. These results suggest the microRNA-199a could play a role in the development of endometriosis.