

Characterization of adult stem cells in endometrial biopsies obtained during routine diagnostics

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Introduction Human endometrium displays a highly regenerative capacity possibly owed to adult stem cell activity. It is hypothesized that disorders of the endometrium such as endometriosis and endometrial carcinoma are associated with a disorder of stem cell function. As a limiting factor of experimental studies to date only uteri from hysterectomies were used to assess stem cell activity. We conducted this study to characterize stem cells of the superficial layers of the stratum superficiale, accessible by diagnostic endometrial biopsy in a routine clinical setting. We wanted to show that minimal invasive endometrial biopsies are an eligible tool to obtain multi-potent stem cells to enable studies in larger patient populations.

Methods 36 patients underwent routine endometrial biopsy (Probet, Gynemed) during diagnostics prior to infertility therapy. Endometrial stroma cells were isolated by immunodepletion and the expression of stem cell markers was analyzed by quantitative real time PCR and FACS analysis. Differentiation potential and cloning efficiency of serially passaged cell clones were studied in vitro.

Results Endometrial stroma cell clones derived from endometrial biopsies displayed characteristic properties of stem cells including clonality, long time cultivation, multipotent differentiation potential and expression of the stem cell markers CD 146, CD 73, Msi-1, Notch-1 and Sox-2.

Conclusion Adult stem cells can be obtained from endometrial biopsies in a routine diagnostic setting. These findings will stimulate and accelerate stem cell based studies to develop innovative diagnostic and therapeutic concepts of endometrial disorders in large patient populations.