



Tabriz University of Medical Sciences

Faculty of Nursing and Midwifery

A Thesis for Degree of Master of Science in Midwifery

(Reproductive health)

**The effect of intra-ovarian injection of c-Kit⁺ bone marrow cells in
ovarian rejuvenation of menopause rats**

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Abstract

Today cell therapy is considered as a new emerging therapeutic methods in medical sciences. Bone marrow derived c-Kit⁺ cells, have the ability to differentiate into different cell types including multipotent myeloid progenitor and multipotent lymphoid progenitor. In this study, intra ovarian injection of bone marrow derived c-Kit⁺ cells with the aim of ovarian rejuvenation was carried out in the rat model of ovarian insufficiency. Animal modeling was performed by daily intraperitoneal injection of 160 mg/kg 4-vinylcyclohexene dipoxide (VCD) daily for 15 days. Using magnetic-activated cell sorting (MACS) technique, c-Kit positive and negative cells were isolated from the bone marrow of rats and transplanted into the ovary. Significant increase in atretic follicles was observed in the VCD treated group compared to the control and c-Kit⁺ groups. In contrast, substantial increase in healthy follicles was observed in the c-Kit⁺ compared to the saline and VCD groups. Angiogenesis related transcript analysis revealed that, the expression of KDR and ANG in the groups under VCD injection without treatment or treatment with saline was higher and the evidence of morphologic hypertension and severe inflammation in these groups were confirmed. The fertility rate in the c-Kit⁺ and control group was 100% and had a significant difference with other experimental groups. Hormonal results showed an increase in VCD and decrease in the c-Kit⁺ treated group however these results were not significant. These findings suggests that intra-ovarian injection of c-Kit⁺ cells isolated from bone marrow is a potential and putative approach for ovarian rejuvenation and restoration of fertility related consequences.