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Keyword 1: Bone Marrow Derived Stem Cells
Keyword 2: Ovarian rejuvenation
Keyword 3: Ovarian niche vascularization

1. Abstract Categories: 15.5. Regenerative Medicine

2. Previously Presented:
Has this abstract been previously presented as it is written? No
Has this abstract been partially presented? No
Presentation Date:
Where was this abstract presented:

3. Data Requirement Questions

My submitted abstract(s) contains original data, written in standard scientific form, complete with numeric values and statistical analyses when appropriate: Yes

If my abstract contains microarray data, all analyses must be accompanied by confirmation of expression changes with either transcript or protein data: Not Applicable

All data derived using the same paradigm (set of patients or experiments) will not be separated into multiple abstracts: Yes

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4. I will comply with the SRI Abstract Withdrawal Policy: Yes

Title: Infusion Of Human Bone Marrow-Derived Stem Cells Improved Ovarian Function In Chemotherapy-Damaged Ovaries In Mice.

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Introduction: Aging, poor ovarian response and other damaging-acquired conditions like oncologic treatments, lead to an impaired ovarian function. Nevertheless, even when the damaged ovaries have lost their ability to ovulate, they might contain a residual pool of quiescent follicles that could be activated to growth. Infusion of bone marrow-derived stem cells(BMDSC) could provide an ovarian niche for follicular rescue and rejuvenation.
Objective: To assess regenerative effects of human BMDSC on chemotherapy-damaged ovaries in mice.

Methods: Twelve 8-week old female NOD-SCID mice were treated with two different chemotherapy regimens to induce ovarian damage. Standard treatment (1xChT,n=6) consisted of a single injection of 12mg/kg busulfan (Bu) and 120mg/kg Cyclophosphamide (Cy) while the reduced dose (0.1xChT,n=6) was 1.2mg/kg Bu+12mg/kg Cy. A week later (Day 0) animals from both groups were randomized to receive an injection of PBS (Control,n=3each) or $1x10^6$ Human Rhodamine B-labeled BMDSC (BMDSC groups) via tail vein. Controlled ovarian stimulation was induced on day 14 with 10IU of PMSG+hCG. Then ovaries were recovered to evaluate follicle growth, proliferation, apoptosis and vascularization.

Results: In the standard chemotherapy groups, antrum cavity formation (BMDSC:10.6±1.8% vs. Control:5.9±2.6%,p=0.01) as well as % of pre-ovulatory follicles (1.6±0.9% vs. 0.2±0.1% respectively,p<0.01) were increased in mice receiving BMDSC when compared to controls. In the reduced dosage groups, BMDSC also increased antrum (BMDSC:8.9±5.2% vs. Control:5.2±1.9%,p=NS) and pre-ovulatory follicles (1.7±0.9 vs. 0.5±0.8 respectively,p=0.04).
When ovarian stroma was examined, improvement in micro-vessel density (1xChT-BMDSC:5.1±0.8% vs. 1xChT-Control:1.8±0.9%,p=0.01), increases in cell proliferation (2.3±0.5% vs. 1.0±0.3%,p=0.04) and decreases in apoptosis (0.5±0.2% vs. 5.1±3.6%,p=0.04) were detected after BMDSC infusion in the standard dose. In the 0.1xChT dose, BMDSC also increased cell proliferation (BMDSC:1.4±0.4 vs. Control:0.7±0.2%,p=0.04) but decreased apoptosis (0.5±0.2 vs. 5.9±3.6 respectively,p=0.04).

Conclusions: Human BMDSC infusion improved ovarian function by promoting follicular growth to the pre-ovulatory stage, increasing vascularization and cell proliferation as well as suppressing apoptosis in chemotherapy-damaged ovaries in mice.
PROMETEOII/2014/045

Survey

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2. **Please tell us what kind of society membership you currently hold** In-Training member

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   Networking:
   To present my own data:
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   Other (please specify):
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9. **Career Sector:** In-training
10. **Moderating a concurrent session** No
11. **Academic Status** Postdoctoral Fellow
12. **What percent of time do you spend giving Clinical Care?** 10
13. **Department/ Division** Basic Science Department
14. **Please list your sub-specialty** Basic Reproductive Sciences
15. **How would you best represent your primary research?** Translational research

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