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## Autologous stem cell transplantation in patients with idiopathic premature ovarian failure

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**Background:** Premature ovarian failure (POF) is defined as failure of the ovary to function adequately in its role either as an endocrine organ or as a reproductive organ in a woman younger than 40 years of age. It is characterized by amenorrhea, hypoestrogenism and elevated serum gonadotropin levels. This condition occurs in approximately 1% of women and it has major physical and psychological consequences/impact in those patients. Stem cell therapy is increasingly gaining grounds in the regeneration of damaged or failed tissues and organs.

**Aim:** The purpose of this study is to investigate the role of the transplantation of autologous bone marrow derived mesenchymal stem cells in amelioration of this condition.

**Study Design:** It is an open label single group safety/efficacy study. Primary outcome measures are cases will be followed using serum FSH, estrogen and anti-mullerian hormone levels. Secondary outcome measures are disappearance of menopausal symptoms e.g., hot flashes rise in serum AMH level, pregnancy rate within 1 year, miscarriage rate within one year of injection and long term follow-up for any adverse effect, assessed for one year from injection.

**Subjects:** 30 patients with POF were included. Inclusion Criteria: (1) Patients with normal karyotype spontaneous premature ovarian failure. (2) Patients between 18-40 years old. Exclusion Criteria: (1) Patients with secondary ovarian failure (e.g., hypothalamic causes). (2) Autoimmune diseases. (3) Those with major medical problems such as malignancy, hepatitis, etc and (4) Abnormal karyotyping (e.g., Turner syndrome)

**Methods:** After stimulation with G-CSF, 60 ml of bone marrow were aspirated from the posterior iliac spine and mesenchymal stem cells (MSCs) isolation was done under GMP conditions. Isolated MSCs were injected in one side as follows; 3-5 million in the ovarian tissue through laparoscope and 3-5 million in the ovarian artery through catheter.

**Results & Conclusions:** 26 out of the 30 patients included (86.7%) showed fall in FSH levels and rise in estrogen and AMH levels after 4 weeks of injection and this change was maintained throughout the 48 week follow-up period. 18 patients (60%) showed ovulation with ovum sizes ranging from 12-20 mm. Only one patient had spontaneous pregnancy, while three patients were subjected to IVF cycles. This study shows that autologous MSC may improve the conditions in patients with POF. Optimization of the cell dose and route of injection needs further experimentation.

### Biography

Hala Gabr is a renowned Researcher in Stem Cell Biology and Therapy in Cairo University, Egypt. She is the Director of the Pediatric Bone Marrow Transplantation and Cellular Therapy Lab in Cairo University. She is the Co-Founder of the Egyptian Society for Progenitor Stem Cell Research, the leading stem cell research body in Egypt. She has published more than 30 papers in reputed journals and is an Editorial Board Member of a number of reputed journals. She has supervised nearly a hundred PhD and master thesis in stem cell research.

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