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## Mesenchymal stem cells offer multi-mechanistic approaches for mitigation of degenerated dopaminergic neurons

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**Background:** Parkinson's disease (PD) has been considered a paradigm of degenerative diseases of the nervous system characterized by motor impairment due to malfunction and loss of dopaminergic neurons. Currently there is no therapy clinically available that delays the neurodegenerative process; therefore modification of the disease course is an unmet clinical need. Mesenchymal stem cells (MSCs) have been considered as a promising therapeutic strategy for acute injury and degenerative diseases of the central nervous system.

**Objective:** The current work aimed to elucidate the possible role of single intravenous dose of bone marrow derived MSCs (BM-MSCs) in restraining dopaminergic neurons in experimental model after 2 months.

**Materials & Methods:** Thirty two ovariectomized animals were classified into 4 groups; Group (1) was control, Groups from (2) to (4) were subcutaneously administered with rotenone for 14 days after one month of ovariectomy for induction of PD. Group (2) was left untreated; Groups (3) and (4) were treated with sinemet and BM-MSCs respectively. Y-chromosome gene (sry) was assessed by PCR in brain tissue of the female rats. Serum TGF- $\beta$ 1 and MCP-1 levels were assayed by ELISA technique. Brain dopamine level was assayed fluorometrically while, brain TH and nestin genes expression were detected by sqRT-PCR.

**Results:** The data of the current work revealed that BM-MSCs were able to home at the injured brains and produced significant decrease in serum TGF- $\beta$ 1 and MCP-1 levels associated with significant increase in brain dopamine content, brain TH and nestin genes expression levels.

**Conclusion:** The observed improvements in the studied biomarkers after 2 months from intravenous transplantation of BM-MSCs sheds light on the promising role of BM-MSCs in ameliorating neurodeterioration of dopaminergic neurons through their anti-inflammatory and neurogenic effects.

### Biography

Hanaa H Ahmed has completed her PhD from Faculty of Science, Cairo University. She is the Head of Hormones Department, Medical Research Division, National Research Centre, one of the biggest research centers in Egypt. She has published more than 84 papers in reputed journals and 11 international books and serving as an Editorial Board Member of 9 international journals. She has awarded the Prize of Excellence at the National Research Centre in the Field of Science and Technology, which serves the Advanced Medical Science, (2013).

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