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## MESENCHYMAL STEM CELLS AND DIFFERENTIATED INSULIN PRODUCING CELLS ARE NEW HORIZONS FOR PANCREATIC REGENERATION IN TYPE I DIABETES MELLITUS

Wafaa Emam, Ayat M Eldomouky, Ashraf S Hegab, Amal AlShahat and Nermin Raafat

Zagazig University, Egypt

**Background:** Diabetes mellitus has become the third human killer following cancer and cardiovascular disease. Millions of patients, often children, suffer from type 1 diabetes (T1D). Stem cells created hopes to regenerate damaged body tissues and restore their function.

**Aim:** This work aimed at clarifying and comparing the therapeutic potential of differentiated and non-differentiated mesenchymal stem cells (MSCs) as a new line of therapy for T1D.

**Methodology:** 40 female albino rats divided into Group I (control): 10 rats and group II (diabetic), III and IV, 10 rats in each, were injected with streptozotocin (50mg/kg body weight). Group III (MSCs) were transplanted with bone marrow derived MSCs from male rats and group IV (IPCs) with differentiated insulin producing cells. Blood and pancreatic tissue samples were taken from all rats for biochemical and histological studies.

**Results:** MSCs reduced hyperglycemia in diabetic rats on day 15 while IPCs normalizes blood glucose level on day 7. Histological and morphometric analysis of pancreas of experimental diabetic

rats showed improvement in MSCs-treated group but in IPCs-treated group,  $\beta$ -cells insulin immunoreactions were obviously returned to normal, with normal distribution of  $\beta$ -cells in the centre and other cells at the periphery. Meanwhile, most of the pathological lesions were still detected in diabetic rats.

**Conclusions:** MSCs transplantation can reduce blood glucose level in recipient diabetic rats. IPCs initiate endogenous pancreatic regeneration by neogenesis of islets. IPCs are better than MSCs in regeneration of  $\beta$ -cells. So, IPCs therapy can be considered clinically to offer a hope for patients suffering from T1D.

### Biography

Wafaa Emam has pursued her MD Degree from Zagazig University, Egypt and Postdoctoral studies from the School of Medicine and is currently the Professor of Medical Biochemistry and Molecular Biology at the same university. She has published more than 20 papers in reputed journals and has participated in several international conferences.

wafh22@yahoo.com