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Stem cell-based approach in nephropathy management: pre-clinical studyHanaa H Ahmed¹, El-Sayed M E Mahdy², Wafaa Gh Shousha³, Hatem A El-mezy² and Mustafa K EL-Sayed²¹National Research Centre, Egypt²Helwan University, Egypt

This study aimed to assess the possible therapeutic role of mesenchymal stem cells (MSCs) isolated from bone marrow and adipose tissue in the management of nephropathy in male rats. Preparation and isolation of MSCs from bone marrow and adipose tissue were done. The isolated cells were identified via the morphological appearance, and the detection of some specific surface markers such as CD90, CD105 and CD45 using flow cytometry technology. The study included 100 adult male rats which were divided into 5 groups. Group (1) was control, group (2) was nephropathic rats, groups (3), (4) and (5) were the groups treated with a single dose of undifferentiated MSCs isolated from bone marrow, undifferentiated MSCs isolated from adipose tissue and lisinopril drug respectively. Our data indicated that the isolated cells were MSCs. This was evidenced from their spindle shape and CD markers. The efficacy of MSCs in kidney repair was evidenced from the significant decline in serum urea, creatinine MCP-1, NF-kB and ET-1 as well as the levels of NAG, in addition to the significant increase in serum nephrin level and GFR value compared with the untreated group. Interestingly, the histopathological investigation confirmed the biochemical data as stem cell therapy evoked great improvement in the structural organization of kidney tissue. This study clearly demonstrated the ability of MSCs, especially isolated from adipose tissue, in mitigating experimental nephropathy. The effectiveness of MSCs in this issue could be attributed to their proliferative capacity, anti-inflammatory activity and anti-apoptotic action.

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 155 papers in reputed journals and 22 international books and serving as an Editorial Board Member of 31 international journals. She was awarded the Prize of Excellence at the National Research Centre in the Field of Science and Technology, the Advanced Medical Science (2013).

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