

## **Can Transplantation Of Mesenchymal Stem Cells (MSCs) Provide Protection For Radiation Induced Mucosal Injury? (A Systematic Review And Meta-Analysis On Animal Studies.)**

**BasmaElsaadany<sup>1\*</sup>, RaniaShalaby<sup>2</sup>, NerminYussif<sup>3</sup>**

<sup>1</sup>Oral medicine & Periodontology, Faculty of Dentistry Cairo University,  
Egypt

<sup>2</sup>Oral medicine & Periodontology, Faculty of Dentistry, Fayoum University,  
Egypt

<sup>3</sup>National Institute of Laser Science-Cairo University, Egypt

**Abstract:**Objective: Patients who undergo radiotherapy may develop acute and/or chronic side effects resulting from gastrointestinal tract (GIT) alterations. In this study, we address the question of the regenerative capability of mesenchymal stem cells (MSC) after radiation-induced GIT mucosal injury. Method: we systematically assessed the evidence in the scientific literature for the effectiveness of MSCs in animal models of radiation mucositis regarding epithelial thickness preservation and proliferative /apoptotic activity of the tissue. SYRCLE's tool for assessing risk of bias was used to assess the internal validity of the included studies. **Data extraction and data synthesis:** Seven studies were included. Data regarding the animal model, intervention and outcome was extracted and tabulated. The quality of the studies was generally low regarding randomization, allocation and blinding. The heterogeneity was very high due to variability of animal model, intervention used, types of cells, dose and outcome assessment technique and timing. Epithelial thickness within first 2 weeks after irradiation was reported in 4 studies included in a meta-analysis. **Results:** Within first week results showed that the pooled effect estimate was no significant (MD 125.5 [-32.3, 283.3] P=0.12). Sensitivity analysis after excluding study measure the outcome after 3 days showed significant pooled effect estimate (MD 191.3 [143.06-239.5] P<0.0001). While within the 2nd week there was no significant effect estimate MD 36.6. [-16.8-89.73] P=0.18) and heterogeneity was very high (I<sup>2</sup>=96%). **Conclusions:** Systemic injection of MSCs after irradiation decreasing the effect of radiation on epithelial thickness. However, this effect is significant in second week after irradiation. Further powered preclinical studies are needed considering less potential risk of different sources of bias before shifting for clinical trials.

**Keywords:** MSCs, Radiation mucositis, Animal studies, Meta analysis, Epithelial thickness.