Stem Cells a Potential Treatment for Acute Kidney Injury

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Background:

The Mesenchymal stem cells have regenerative activity due to the self-renewal property and its differentiation potential, the bone marrow is one of the main sources of mesenchymal stem cells used clinically, the aim of this study that to test the migration of mesenchymal stem cells in the damaged tissue of the kidney causing regeneration for it by secreting specific cytokines, inflammatory mediators and immune response.

Methods:

Using 30 albino rats, rats were randomly assigned to five equal groups, (group 1) which is the control group receiving 1 ml normal saline, (group2) is a diseased group receiving 5 mg/kg intraperitoneal injection of cisplatin to induce (AKI), (group3) receiving 2mg/kg trosemide, (group4) receiving the isolated MCS through the rat tail vein and (group5) receiving both the MSC and trosemide, rats were sacrificed at different time intervals, Serum creatinine, BUN, and renal tissue oxidative stress parameters were measured. Renal tissue was scored histopathologically for evidence of injury, regeneration, and chronicity. Immunohistochemistry and ELISA were also done.

Results:

MSCs of bone marrow of healthy rats were able to recover cisplatin induced acute kidney injury and tissue damage, rats that treated by isolated MSCs shows high proliferative activity and they are able to decrease the level of oxidative stress and improving all renal functions (serum creatinine, BUN), renal histopathology shows higher regenerative activity in renal cortex with the least necrotic lesions, also found that trosemide potentiate the activity of MSCs, and by using the ELISA low expression of interleukins and tumor necrosis factor alpha was found.

Conclusion:

In conclusion, there are treatment options offered for AKI. This study suggest that mesenchymal stem cells are promising candidate that could be more beneficial for AKI patients, despite the controversy regarding its use, but MSCs alone showed very promising recovery signs, even when it was combined with the usual AKI treatments, it was capable of offering better recovery then the usual drugs and also reducing the side effects of those drugs.

Keywords

Mesenchymal Stem Cells, *Cytokines*, Creatinine, ELISA, Trosemide, Immunohistochemistry

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Biography:

Amal abdelaziz abdelrahman grew up in Egypt specially in cairo , was born at 6/1/1999, live in sheikh zayed, 13 district,villa 62. Studied pharmacy at MSA university and worked as assistant for plastics surgery doctor , was a member of MWHO , participated in united nation project on HIV and non-communicable diseases under the project of "heal a nation 0.7 in colombo, Sri Lanka, attended a stem cell culture workshop at MSA university research labs , worked at Bahya foundation for breast cancer and the national cancer institute and attending all WHO awareness courses about covid 19 , attending also gene analysis workshop in Cairo university research park , now working on project under title of "stem cells, a potential treatment for acute kidney injury " under the supervision of dr. Shetein mahmoud , lecturer at MSA university, Biochemistry department.

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