allied academies Joint Event on
International Conference on
CARDIOLOGY AND CARDIOVASCULAR MEDICINE
&
International Conference on
STEM CELLS AND REGENERATIVE MEDICINE
June 18-19, 2018 | Osaka, Japan
Biomed Res 2018, Volume 29 | DOI: 10.4066/biomedicalresearch-C2-006

THERAPEUTIC POTENTIAL OF STEM SELLS AND ZINC ON REDUCTION OF LIVER FIBROSIS

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Globally 1 out of 40 people died due to chronic liver diseases. In case of liver failure, transplantation is the last available therapy but due to lack of donor, graft rejection, operative damage and high cost making this therapy unsuccessful. Stem cells therapies developed new ways to treat liver diseases, but due to oxidative stress at damage site causes poor MSCs proliferation and engraftment. The aim of the current study was to explore the therapeutic potential of $ZnSO_4$ and MSCs on CCl_4 induce hepatic toxicity. In the current study, CCl_4 (1µl/g) was injected intraperitoneally to female BALB/c mice, twice in a week up till 4 weeks to induce liver damage. MSCs was isolated from femoral and tibial bone of Balb/C mice and were cultured for two weeks. These cultured cells and $ZnSO_4$ both were induce separately as well as in combination in mice body. The mice were then classified into 5 groups: negative control, positive control, CCl_4+MSC treated group, CCl_4+$ZnSO_4$ treated group and CCl_4+MSCs+$ZnSO_4$ treated group. The morphological results showed that in contrast to only MSCs therapy, $ZnSO_4$ along with MSCs showed significant therapeutic result on CCl_4 injured mice. Biochemically, serum ALT and total bilirubin level were found to be significantly decreased in mice treated with $ZnSO_4$ and MSCs. Histopathological examination also revealed that both $ZnSO_4$ and MSCs have strong anti-apoptotic effect on CCl_4 injured liver by decreasing the number of apoptotic hepatocytes in both $ZnSO_4$ and MSCs transplanted mice. RT-PCR results at mRNA level also confirm a significant anti-fibrotic effect of $ZnSO_4$ and MSCs (in combination) transplanted mice on fibrotic liver as evidenced show the down-regulation of apoptotic marker (Bax) and enhancing anti-apoptotic (Bcl-xl) and hepatic marker (Albumin). Thus it is concluded that $ZnSO_4$ is a powerful antioxidant and have the ability to enhance the proliferation rate of MSCs.

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