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List of abbreviations

Abbr.	Description
A	: Absorbance
Alb.	: Albumin
ALF	: Acute liver failure
ALP	: Alkaline phosphatase
ALT	: Alanine aminotransferase
ANOVA	: Analysis of variance
ASC	: Adult stem cell
AST	: Aspartate aminotransferase
b.wt	: Body weight
BM	: Bone marrow
C	: Centrifugate
CB	: Cord blood
CD	: Cluster of differentiation
D.B	: Direct bilirubin
DMEM	: Dulbecco's modified Eagle's medium
DNA	: Deoxyribonucleic acid
ECM	: Extracellular matrix
EDTA	: Sodium salt of ethylene diamine tetra acetate
ESC	Embryonic stem cell
FGF	: Fibroblast growth factor
GIT	: Gastrointestinal tract
gm	: gram
GTC	: Guanidine thiocyanate
H&E	: Hamatoxylin and eosin
HCC	: Hepatocellular carcinoma
HGF	: Hepatocyte growth factor
HOCs	: Hepatic oval cells
HSCs	: Hematopoietic stem cells
I/P	: Intraperitoneal
I/V	: Intravenous

In. B	: Indirect bilirubin
mg	: Milligram
ml	: Milliliter
MMP2	: Matrix metallo proteinase
MPCs:	Multipotential mesenchymal progenitor cells
MSCs	: Mesenchymal stem cells
NAPQI	N-acetyl-p-benzoquinone imine
Nmol	: Nanomole
PBS	: Phosphate buffer saline
RNA	: Ribonucleic acid
RNase	: ribonuclease
rpm	: Round per minute
RQ	: Relative Quantification
RT-PCR	: Real time polymerase chain reaction
S.P	: Side population
SE	: Standard error
T.P.	: Total proteins
TIMP	: Tissue inhibitor metallo proteinase
UCP	: Umbilical cord blood
µg	: Micro-gram
µl	: Micro-liter
µmol	: Micro-mole

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SUMMARY

Liver is one of the most vital organ, it has a prominent role in the regulation of physiological processes. It involved in varieties of vital function such as metabolism of nutrient as lipids, carbohydrates and vitamins. Furthermore, detoxification, metabolism and excretions of drugs and other xenobiotic from the body by detoxifying and eliminating them, also it regulate the level of plasma glucose, ammonia and cholesterol and other functions.

Liver diseases are among the most serious health problems.

Liver diseases are mainly caused by toxic chemicals (certain antibiotic, paracetamol, carbon tetrachloride, aflatoxins, peroxidized oil … etc), excess consumption of alcohol, autoimmune disorder and infection.

Up till now, orthotropic liver transplantation is the best effective treatment of liver diseases.

However, due to the shortage of donors, high costs, the number of patients who can benefit from this modality is very limited.

In recent years, cell based therapies have investigated as alternative to whole liver transplantation.

Thus the aim of this study was to investigate the effect of injection of bone marrow mesenchymal stem cells (BM-MSCs) on the experimental liver injury with acetaminophen.

Method

1- Isolation, cultivation and identification of MSCs from bone marrow.

2- Thirty rats of 130-170 gm body weight were divided into three equal groups, ten animals each.

Group 1: normal control.

Group 2: were injected intraperitoneal with acetaminophen (200-300 mg/kg b.wt).

Group 3: were injected intraperitoneal with acetaminophen (200-300 mg/kg b.wt) then injected with mesenchymal stem cells (1 million cell/kg) I/V via tail vain.

After 1 and 2 weeks from injection of stem cells, the animals were fasted overnight. Blood samples were withdrawn from the retro-orbital venous pleuxes for estimation of liver functions, after 2 weeks liver samples were collected for gene expression and histopathological examination and for detection the homing of MSCs in liver.

Result

Results showed that the injection of BM-MSCs improved liver functions test, MPP2 and TIMP.

Histopathological examination of liver tissue showed significant antifibrotic effect, improvement in the hepatic structure as compared to the injured group.