بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

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تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

MONA MAGHRABY

"The Effect of Adipose Derived Stem Cells versus Platelet rich plasma on Submandibular Salivary Glands of Albino Rats Receiving Cisplatin."

(Light and Transmission electron microscopic Study)

Thesis Submitted to Faculty of Dentistry Ain Shams University, for Partial fulfillment of the requirements of PHD Degree in Oral Biology

By

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Dedication

To my parents who I really love and appreciate their efforts throughout my life and nothing could reward them,

To my supporting, Lovely husband Hany who has never left my side,

To my two little angels Abdullah and Taliah who are the best gifts I have ever had,

To my dear sister and brothers who are my backbone and always help and support me in every way,

To the soul of my dear Grandparents who I really miss,

To all the people I love.

ABSTRACT

Background: The aim of our study was to determine and compare the effectiveness of Adipose derived stem cells (ADSCs) and platelet rich plasma (PRP) as a treatment modality against cisplatin-induced cytotoxicity in the submandibular glands (SMG) of Albino rats.

Methods: Sixty two adult male albino rats, weighing between (250-300 grams) were used. Ten rats were used as a source of PRP and the rest were divided as follows: Group I: saline control; Group II (cisplatin gp.) this group received 5mg/kg/week cisplatin intraperitoneal on day 1 and 8*;* Group III: this group received ADSCs (2×10^6 cells/rat) once intravenously via tail vein + cisplatin at the same dose as group II; Group IV: this group received PRP (0.5 mL/kg) by intraperitoneal injection 3times/week) + cisplatin at the same dose as group II . All groups were further divided into two main subgroups; subgroup A (was sacrificed on day 10) and subgroup B (was sacrificed on day 18). In all groups, SMG were examined histologically, histochemically and ultra-structurally on day 10 and 18. The area fraction of both acini and apoptotic cells as well as the median osmotic fragility in all subgroups were calculated.

Results: A significant increase in area fraction of acini as well as the median osmotic fragility and a significant decrease in area fraction of apoptotic cells in both ADSCs and PRP groups compared to cisplatin group at day 10 and 18 respectively. At day 10 ADSCs showed better result compared to PRP group represented by significant increase in area fraction of acini. On day 18 there were non-significant difference between ADSCs group and PRP group regarding all comparing parameters.

Conclusions: Both ADSCs and PRP could be considered as an effective treatment for the cisplatin induced SMG damage. ADSCs seemed to have a more rapid effect in treatment of cisplatin induced SMG damage. However, PRP with its repeated protocol of administration, safety, low cost and non-reported immunological hazards or resistance, could be more profound especially for the repeated regimen of chemotherapy treatment.

Keywords: ADSCs, Cisplatin, Treatment effect, Submandibular gland, PRP.

LIST OF ABBREVIATIONS

ADSCs : Adipose derived stem cells.
ADP : Adenosine diphosphate.
AG : A granular.
AIF : Apoptosis inducing factor.
ATP : Adenosine tri-phosphate.
BAT : Brown adipose tissue.
BAK : Bcl-2 homologous antagonist/killer.
BAX : B cell lymphoma 2 associated x protein.
Bcl-2 : B cell lymphoma 2.
BH3 : Bcl-2 homology domain 3 only protein.
BMSCs : Bone marrow stem cells.
BVs : Blood vessels.
Cis. : Cisplatin.
CT : Connective tissue.
DAMPs : Damage associated molecular pattern.
DMEM : Dulbecco's modified eagle media.
DNA : Deoxyribonucleic acid.
ECM : Extra cellular matrix.
EDs : Excretory ducts.
EGF : Epidermal growth factor.
Endo G : Endonuclease G.
ESCs : Embryonic stem cells.
FAS : First apoptosis signal.

FASL : FAS Ligand.
FBS : Fetal bovine serum.
FGF : Fibroblast growth factor.
Fig. : Figure.
G : Golgi.
GCSF : Granulocyte colony stimulating factor.
GCTs : Granular convoluted tubules.
Gp. : Group.
GR : Granular.
H&E : Hematoxylin & eosin.
HGF : Hepatocyte growth factor.
hSGSCs : Human SMG stem cells.
HSV-1 : Herpes simplex-1
IDs : Intercalated ducts.
IDO : Interleukin dioxygenase.
IgA : Immunoglubin A.
IGF : Insulin-like growth factor.
IgG : Immunoglubin G.
IL-1, 6, 8 : Interluken-1, 6, 8.
iPSCs : Induced pluripotent stem cells.
LPL : Lipoprotein lipase.
L-PRF : Leucocyte and platelet rich fibrin.
L-PRP : Leucocyte and platelet rich plasma.
LPS : Lipo-polysaccharide.
M : Mitochondria.
Min. : Minute.
MRSA : Methicillin resistive staphylococcus aureus.
MSCs : Mesenchymal stem cells.
MVs : Micro-vesicles.
N : Nucleus.

n : nucleolus.
NGF : Nerve growth factor.
NF-kB : Nuclear factor Kappa B.
Org.mag. : Original magnification.
PAMPs : Pathogen associated molecular pattern.
PBS : Phosphate buffered saline.
PCNA : Proliferating cell nuclear antigen.
PDGF : Platelet derived growth factor.
PGE2 : Prostaglandin E2
PLA : Processed lipoaspirate cells.
P-PRF : Pure platelet rich fibrin.
P-PRP : Pure platelet rich plasma.
PRP : Platelet rich plasma.
RBCs : Red blood cells.
rER : Rough endoplasmic reticulum.
RNA : Ribonucleic acid.
SDs : Striated ducts.
SDF-1 : Stromal derived factor-1
SG : Secretory granules.
Stem. : Stem cells (adipose derived stem cells).
SMG : Submandibular salivary gland.
Subgp. : Subgroup.
SVF : Stromal vascular fraction.
TGF : Transforming growth factor.
TLRs : Toll like receptors.
TLRL : Toll like receptor ligand.
TNFα : Tumor necrotic factor α.
TNFR : Tumor necrotic factor receptor.
TUNEL : Terminal deoxynucleotidyl transferase-mediated deoxyuridine triphosphate nick end labeling.

VEGF : Vascular endothelial growth factor.
WAT : White adipose tissue.
WBCs : White blood cells.

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