Comparative Study on the Effect of Silver Nanoparticles Versus Silver Sulfadiazine in Diabetic Wound Healing in Albino Rat: A Histological Study

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By

Heba Mohamed Fawzy Elsayed

Assistant Lecturer of Histology and Cell biology

Faculty of Medicine, Ain Shams University

Under Supervision of:

Prof.Dr. Amany Mohamed Hoseny El shawarby
Professor of Histology
Faculty of Medicine, Ain shams university

Prof.Dr. Nagwa Kostandy Kalleny
Professor of Histology
Faculty of Medicine, Ain Shams University

prof.Dr. Safaa Mohamed Shaker
Professor of Histology
Faculty of Medicine, Ain Shams University

Faculty of Medicine

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Contents

List of abbreviations:

* Silver:	Ag
* Silver nanoparticles:	AgNPs
*Adenosine triphosphate:	ATP
* Bovine serum albumin:	BSA
* Cluster of Differentiation:	CD
*Diaminobenzidine:	DAB
*Diabetic foot ulcer:	D FUs
* Deoxyribo Nucleic Acid:	DNA
* Distyrene Plasticizer Xylene:	D.P.X.
* Escherichia Coli:	E. coli
* Extracellular matrix:	ECM
* Epidermal growth factor:	EGF
* Epithelial mesenchymal transition:	EMT
* Endothelial nitric oxide synthase:	eNOS
* Endothelial progenitor cells:	EPC
* Epidermal proliferative unit:	EPU
* Fibroblast growth factor:	FGF

* human beta defensins:	hBD
* Host defense peptides:	HDPs
* Heat Shock Protein:	HSP
* Interferon:	IFN
* Interleukien:	IL
* Keratin:	K
* Keratinocyte growth factor:	KGF
*least significant difference:	LSD
* Macropgage:	M
*Major histocompitability:	MHC
* Matrix metalloprotinease:	MMP
* Messenger Ribonucleic Acid:	mRNA
*Nitric oxide:	NO
*Nano particles:	NPs
*Tumor protein p53:	P53
*polymerase chain reaction:	PCR
*Platelet derived growth factor:	PDGF
*potential hydrogen:	PH

*Proteinase K Digestion:	PKD
* RiboNucleic Acid:	RNA
*Reactive oxygen species:	ROS
*Staph. Aureus:	S. aureus
*Stromal cell derived factor:	SDF
*Standard Deviation:	SD
*Silver sulfadiazine:	SSD
*Streptozotocin:	STZ
*Transcription dependant signaling:	TDS
*Transforming growth factor:	TGF
*Tumour necrosis factor:	TNF
*Vascular endothelial growth factor:	VEGF
*Zink oxide nanoparticles:	ZnONPs

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Abstract

Introduction: The impairment of wound healing in diabetic patients is an important clinical problem affecting millions of patients worldwide. This significant health care problem lacks effective therapy. The ideal wound dressing is resistant to external forces and pathogens.It reduces patient discomfort, and achieves good cosmetic results.

Aim of the work*:* was to compare the effect of silver nanoparticles versus silver sulfadiazine on diabetic wound healing in adult albino rat.

Material & Methods*:* Fifty adults female albino rats were included. The animals were divided into four groups. **Group I** (control).**Group II** (untreated diabetic wound): which included 15 rats, subdivided into three subgroups. specimens obtained on the same day,7 and 15 days of wound excision.

GroupIII:which included 10 rats divided into 2 subgroups.In which silver sulfadiazine cream was applied on the wound daily for 7 and 15 days after excision.

GroupIV: which included 10 rats divided into 2 subgroups. In which nanosilver-ointment was applied on the wound daily for 7 and 15 days after excision.

At the end of the experiment, the specimens were taken and processed for immunohistochemical and histological studies. Morphometric and statistical studies were carried out.

Results: Examination of skin sections of nanosilver treated group revealed continuous epidermis with differentiated keratinocytes with proliferating basal layer .The dermis showed increased collagen deposition ,decreased p53 and increased VEGF expression compared to SSD treated group.

Conclusion: Silver nanoparticles could be more effective than silver sulfadiazine in treatment of diabetic wound.

Introduction