بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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جامعة عين شمس

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قسم

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MONA MAGHRABY

Comparative Study Between The Efficacy Of Topical Sildenafil And Topical Minoxidil In The Treatment Of Male Androgenic Alopecia

A Thesis

Submitted for Fulfillment of Master Degree
in dermatology, venereology and andrology

Presented By

Ali Abdulkareem Al-Shabkhon

M.B.B.Ch.

Faculty of Medicine, Mosul University

Under Supervision of

Prof. Dr. Adel Ahmed Halim Emam

Professor of Dermatology, Venereology and Andrology
Faculty of Medicine, Ain Shams University

Dr. Ahmed Abd Elfattah Afify

Lecturer of Dermatology, Venereology and Andrology
Faculty of Medicine, Ain Shams University

Faculty of Medicine
Ain Shams University
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Ali Abdulkareem Al-Shabkhon

List of Contents

List of Tables

List of Tables (Cont.)

List of Figures

List of Abbreviations

Abb.	Full term
5 α -DHT	5α dihydrotestosterone.
5αR	5 alpha-reductase
ADSCs	Adipose-derived stem cells
AGA	Androgenic Alopecia.
BCL-2	B-Cell lymphoma protein.
CAD	Coronary artery disease
cGMP	Cyclic guanosine monophosphate
DHEA	Dehydroepiandrosterone
DHT	dihydrotestosteron
DKK-1	Dickkopf1
DP	Dermal Papilla
EDA2R	EctodysplasinA2 Receptor
EGF	Epidermal growth factor.
ERK	Extracellular signal-related kinase
FDA	Food and Drug Administration
FPHL	Female pattern hair loss.
FT	Frontotemporal
GSK3B	Glycogen synthase kinase-3B
HDAC9	Histone deacetylase 9.
HDD	Hair diameter diversity
hDPCs	Human dermal papillary cells
HF	Hair follicle
HT	Hair transplantation
IGF	Insulin- like growth factor

List of Abbreviations (Cont.)

Abb.	Full term
IL-1B	Interleukin 1 beta
IL1α	Interleukin 1 alpha
MAPK	Mitogen-activated protein kinase.
MPHL	Male-Pattern hair loss.
NO	Nitric oxide
P. acnes	Propionibacterium acnes
PDE5	Phosphodiesterase type 5
PDGF	Platelet derived growth factor
PGD2	Prostaglandin D2
PRP	Platelet-rich plasma.
PSA	Prostate-specific antigen
PTG	Phototrichogram
ROS	Reactive oxygen species
SD	Standard deviation
TGF-B	Transforming growth factor beta
TH	Terminal hair
TNF-a	Tumor necrosis factor alpha
VEGF	Vascular-endothelial growth factor
VH	Vellus hair

INTRODUCTION

Androgenic alopecia (AGA) is a thinning of the hair induced by androgens in genetically susceptible men and women, also known as male-pattern hair loss (MPHL) and female-pattern hair loss (FPHL) in women. Thinning of hair usually begins between 12 and 40 years old in males and females. Inheritance is polygenic ***(Gassmueller et al., 2008).***

AGA is the major type of alopecia affecting 60-70% of the population. It is caused by the overproduction of 5αdihydrotestosterone (5α-DHT), a potent androgen within the hair follicle, specifically the dermal papilla (DP) cells that are the main regulators of hair growth and are the only site of 5α-DHT action ***(Jain and De-Eknamkul, 2014).***

Sildenafil is a selective inhibitor of phosphodiesterase 5 (PDE5) and was originally developed as an anti-anginal drug due to its vasodilatory and antiplatelet coagulation properties. Sildenafil enhances proliferation of human dermal papilla cells and up-regulates the mRNA expression of vascular endothelial growth factor (VEGF) and platelet-derived growth factor (PDGF) which are responsible for hair growth ***(Choi et al., 2018).***

Minoxidil, a vasodilator medication known for its ability to slow or stop hair loss and promote hair regrowth, was first introduced exclusively as an oral drug to treat high blood pressure.

It was however discovered to have the important side effect of increasing growth or darkening of fine body hairs; this led to the development of topical formulation as a 2% concentration solution for the treatment of female AGA or 5% for treating male AGA. The most common adverse reactions of topical formulation are limited to irritant and allergic contact dermatitis on the scalp ***(Rossi et al., 2011).***

The exact mechanism of action of minoxidil is uncertain, but it has been suggested that it promotes hair growth by opening adenosine triphosphate-sensitive potassium channels and stimulating the synthesis of VEGF in DP cells ***(Blume- Peytavi et al., 2011).***

AIM OF THE WORK

This study aimed to evaluate and compare the efficacy, safety and side effects of topical sildenafil 1% and topical minoxidil 5% in the treatment of androgenic alopecia.