بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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Comparative study of topical latanoprost, tacrolimus and clobetasol propionate in combination with microneedling and narrow-band ultraviolet B in the treatment of non-segmental vitiligo

Thesis

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Ashraf Mohamed

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List of Abbreviations

Abb.	Full term
AGEs	Advanced glycation end-products
AIDS	Acquired immunodeficiency syndrome
ANOVA	Analysis of Variance
CBT	Cognitive behavioral therapy
CD	Cluster of differentiation
CP	Clobetasol propionate
DAMPs	Damage-associated molecular patterns
DHICA	Dihydroxyindole-2-carboxylic acid
DPCP	Diphenylcyclopropenone
DR	Dermaroller
EGF	Epidermal Growth Factor
ER:YAG	Erbium-YAG
FDA	Food and Drug Administration
H2O2	Hydrogen peroxide
HCY	Homocysteine
HLA	Human Leukocyte Antigen
ICAM-1	Intra cytoplasmic adhesion molecule 1
IFN	Interferon
IL	Interleukin
JK	Janus kinase
KP	Koebner's phenomenon
LMP	Low molecular weight polypeptide 3
LT	Latanoprost
MBEH	Mono-benzyl ether of hydroquinone
MCH	Major histocompatibility complex
MCH	Melanin concentrating hormone
MSH	Melanocyte-stimulating hormone
NALP1	NACHT-LRR-PYD-containing protein 1
NB-UVB	Narrowband ultraviolet B

List of Abbreviations Cont...

Abb.	Full term
NCES	Non-cultured epidermal cell suspension
NK	Natural killer
NSAIDs	Nonsteroidal anti-inflammatory drugs
NSV	Non segmental vitiligo
PGFα	Prostaglandin F
PUVA	Psoralen with ultraviolet A
ROS	Reactive oxygen species
SBEG	Suction blister epidermal grafting
SOD	Superoxide dismutase
STAT	Signal transducer and activator of transcription
SV	Segmental vitiligo
TCA	Triamicinolone acetonide
TCIs	Topical calcineurin inhibitors
TGF	Transforming Growth Factor
TH	T helper
TNF	Tumour necrosis factor
Tregs	Regulatory T cells
TRP1	Tyrosinase-related protein 1
Tyk2	Tyrosine kinase 2
UV	Ultraviolet
VACAG	Vitiligo analysis by computer-assisted grid
VASI	Vitiligo Area Scoring Index
VEGF	Vascular Endothelial Growth Factor
VESTA	Vitiligo extent score for a target area
VIDA	Vitiligo Disease Activity Score
XE-CI	Xenon-Chlorine

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INTRODUCTION

Vitiligo is a hypomelanotic autoimmune skin disease resulting from loss of functional melanocytes from the skin with a prevalence of 1–2%. The disease can affect individuals of any race or sex and manifests before the age of 20 years in approximately half of all cases ***(Dwivedi et al., 2015).***

The cause of vitiligo is not fully understood. There are a few major hypotheses for the pathogenesis of vitiligo which include the genetic, neural, autoimmune, biochemical, and melanocytorrhagy theories ***(Choi et al., 2014).***

Possible treatment options include topical corticosteroids, calcineurin inhibitors, vitamin D derivatives, phototherapy with ultraviolet A (UVA) and narrow band ultraviolet B (NB-UVB), photochemotherapy with psoralen plus UVA (PUVA) and psoralen with sunlight, surgical techniques and combinations of topical therapies and light treatment ***(Whitton et al., 2016).***

Nonsegmental vitiligo is characterized by a bilateral and often symmetrical distribution of the white patches, an unpredictable course, a polymorphous aspect of the lesions, a significant association with autoimmune diseases and a frequent family history ***(Benzekri and Gauthier, 2014).*** Nonsegmental vitiligo is the most common form of the disease (accounting for 85 to 90% of cases overall) ***(Taïeb and Picardo, 2009).***

Narrow band ultraviolet B is considered as a "golden standard" in vitiligo treatment with high repigmentation rate, which is further increased when combined with other therapeutic options ***(Stanimirovic et al., 2016).*** Narrow band ultraviolet B phototherapy represents a symbol of a specific UVB wave, 311∓ 2 nm ***(Oiso et al., 2013).***

Latanoprost (LT) is a prostaglandin F2alpha analogue that can induce skin pigmentation, a side effect discovered through its use in glaucoma therapy. It upregulates tyrosinase and promotes melanocyte proliferation ***(Dillon et al., 2017).***

Tacrolimus is a macrolide antibiotic produced by Streptomyces tsukubaensis with strong T-specific, immunosuppressant activity. Indeed, topical tacrolimus downregulates proinflammatory cytokines, namely IL-2, IL-3, IL-4, IL-5, IFN- γ, TNF-α and granulocyte-stimulating factors ***(Sisti et al., 2016).***

Clobetasol propionate (CP), a highly potent drug of all the available corticosteroids is widely used in the treatment of various skin disorders including psoriasis, atopic dermatitis and vitiligo ***(Patel et al., 2013).***

Microneedling is used as a method of transdermal drug delivery to increase the absorption of topical immunomodulator drugs. As, application of microneedling device to the skin can create transport pathways or micropores through the stratum

corneum. This technique is used to augment the absorption of drugs, enhance the efficacy, and decrease the period of therapy. In addition, microneedling keeps the epidermis partially intact, hastens recovery, and limits the risks of infection and scarring ***(Mina et al., 2018).***