ESTIMATION OF SERUM PROLACTIN LEVELS AND EXPRESSION OF ITS RECEPTORS IN ALOPECIA AREATA

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BY

RIMA KASSEM KAHHAL

(M.B., B.Ch)

SUPERVISED BY

SAMAR MOHAMED RAGAIE EL-TAHLAWI, MD

PROFESSOR OF DERMATOLOGY

FACULTY OF MEDICINE, CAIRO UNIVERSITY

NERMINE HAMDI EL EISHI, MD

PROFESSOR OF DERMATOLOGY

FACULTY OF MEDICINE, CAIRO UNIVERSITY

OLFAT GAMIL SHAKER, MD

PROFESSOR OF MEDICAL BIOCHEMISTRY

AND MOLECULAR BIOLOGY

FACULTY OF MEDICINE, CAIRO UNIVERSITY

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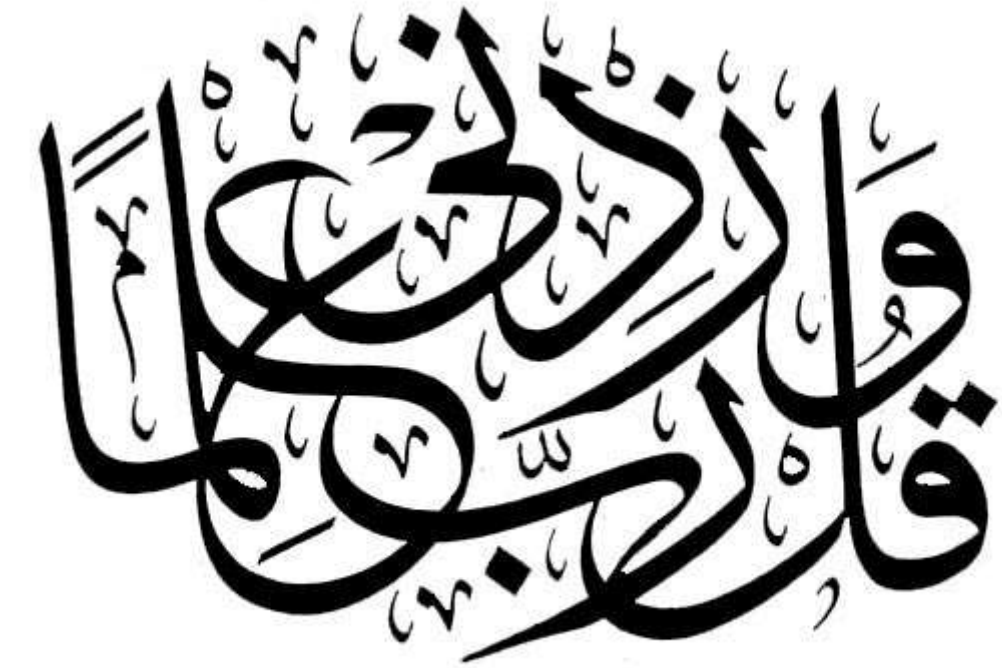

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ABSTRACT

Background: Prolactin is one of the major hormonal signals that are immediately upregulated upon psychoemotional and physical stress. It was found that high prolactin levels are associated with many autoimmune diseases. The relation between prolactin levels and prolactin receptor levels and alopecia areata (a tissue-specific autoimmune disease of hair follicles) represents an attractive area of research.

Purpose: To measure serum levels of prolactin and to detect the expression of its receptors in alopecia areata patients in an attempt to verify their possible roles in the pathogenesis of this disease.

Patients and methods: This study recruited 30 patients with alopecia areata and 20 age-and sex-matched healthy control subjects. Levels of serum prolactin and prolactin receptors were estimated by PCR technique. The correlations between serum prolactin levels as well as the prolactin receptor levels and age, sex, stress exposure, duration of disease and severity of alopecia areata were all assessed.

Results: When comparing between prolactin receptor level in AA patients and controls, it was found that it was significantly higher in patients (mean±SD = 49.90 ± 18.29) than in controls (mean±SD = 37.07 ± 19.30) (*P*=0.02); but no significant difference in the serum level of prolactin was detected in patients (mean±SD = 9.44 ± 4.90) in comparison with controls (mean±SD = 8.67 ± 4.07) (*P*=0.56). In addition, correlating prolactin receptors in the patients to their SALT score showed a statistically significant positive correlation i.e. the greater the SALT score is, the higher the level of the prolactin receptors expressed in the lesion (P=0.05). On the

other hand, no statistically significant correlations were found between the prolactin receptors and the age of the patient, or the disease duration. Also, no statistically significant correlations were found between the serum prolactin levels and the age of the patient or the SALT score. Moreover, both serum prolactin levels and prolactin receptors were not found to be significantly affected by patients' sex, family history, or presence of associated disorders.

Conclusion: Higher levels of prolactin receptors are associated with AA. Moreover, the prolactin receptor expression is positively related to the disease severity through a significant positive correlation between prolactin receptors and the SALT score in patients with AA.

Key words: Alopecia areata, autoimmune, serum prolactin, prolactin receptors

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TABLE OF ABBREVIATIONS

Abbreviation	Meaning
AA	alopecia areata
AT	alopecia totalis
AU	alopecia universalis
APS-1	autoimmune polyglandular syndrome -1
APECED	autoimmune polyendocrinopathy-candidiasis-ectodermal dystrophy
HLA	human leukocyte antigen
MHC	major histocompatibility complex
CD8	cluster of differentiation 8
CD4	cluster of differentiation 4
MICA	major histocompatibility complex class I chain-related protein
NK cells	natural killer cells
AIRE	autoimmune regulator
IL	interleukin
MIF	macrophage migration inhibitory factor
HF	hair follicle
IP	immune privilege
ORS	outer root sheath
TGF-β	transforming growth factor beta
ACTH	adrenocorticotropic hormone
α MSH	alpha melanocyte-stimulating hormone
T_h17	T helper 17
IFN-γ	interferon- gamma
TGF-β	tumor growth factor beta
T-reg	T-regulatory
AR	activating receptor
IR KIR	inhibitory receptor, killer immunoglobulin receptor
MIG	monokine induced by Interferon- gamma
mRNA	messanger ribonucleic acid
IP- 10	interferon inducible protein-10
Th1	T-helper 1
IL-1α	interleukin-1 alpha
IL-1 β	interleukin-1 beta
TNF-α	tumor necrosis factor alpha
BAFF	B cell-activating factor of the TNF family
HPA	hypothalamic-pituitary-adrenal

NGF	nerve growth factor
CGRP	calcitonin gene-related peptide
TR	thioredoxin reductase
GCR	glucocorticoid receptor
PUVA	psoralen plus ultraviolet light A
CsA	cyclosporine A
PRL	prolactin
kDa	kilo Dalton
Cys	cysteine
GH	growth hormone
hPRL	human prolactin
REM	rapid eye movement
PIT-1	pituitary-specific transcription factor
TIDA	tuberoinfundibular dopaminergic system
Ach	acetylcholine
ANG	angiotensin
ANP	atrial natriuretic peptide
BOM	bombesin-like peptide
CCK	cholecystokinin
CT	calcitonin
DA	dopamine
EGF	epidermal growth factor
Est	estrogen
FGF	fibroblast growth factor
GABA	Gamma aminobutyric acid
GAL	galanin
H	histamine
5-HT	serotonin
IGF	insulin-like growth factor
L	lactotrophs
NO	nitric oxide
NorA	norepinephrine
NPY	neuropeptide Y
NT	neurotensin
PACAP	pituitary adenylate cyclase-activating peptide
PC	pituitary cell
SST	somatostatin
TGF-b	transforming growth factor-b
TRH	thyrotropin-releasing factor
TSH	thyroid-stimulating hormone

VIP	vasoactive intestinal peptide
MPHD	multiple pituitary hormone deficiency
MRI	magnetic resonance imaging
IgG	immunoglobulin G
PRLR	prolactin receptors
Ab	antibody
VEGF	vascular endothelial growth factor
DC	dendritic cells
GM-CSF	granulocyte macrophage colony stimulating factor
HO-1	hemeoxygenase-1
HPRL	hyperprolactinemia
SLE	systemic lupus erythematosis
SSc	systemic sclerosis
SS	sjogren's syndrome
SLEDAI	systemic lupus erythematosus disease activity index
PRL–IgG	prolactin- immunoglobulin G
dsDNA	double stranded deoxyribo nucleic acid
PAPS	primary anti-phospholipid syndrome
LARC	liver activation regulated chemokine
BD	Behçet's disease
SP	substance P
Derma REC	Dermatology Research Ethical Committee
OPC	outpatient clinic
SALT	severity of alopecia tool
PCR	polymerase chain reaction
SPSS	statistical Package for the Social Science
SD	standard deviation
ROC	receiver operator characteristic
AUC	area under the curve
y	years
N	number
M	male
F	female
r	Pearson correlation
Fig	figure
RANTES	regulated on activation normal T expressed and secreted

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Introduction and Aim of Work