

بسم الله الرحمن الرحيم





شبكة المعلومات الجامعية التوثيق الالكتروني 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



يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار





بعض الوثائق الأصلية تالفة





بالرسالة صفحات
لم ترد بالأصل



Assessment Of Immunological Changes Disorders In Cases Of Thyroid Eye Disease By Impression Cytology

Thesis

*Submitted For Partial Fulfillment of Master in
Ophthalmology*

By

Eslam Magdy Mahmoud

M.B.B.Ch - Ain Shams University

Supervised by

Prof. Dr. Saad Mohamed Rashad

Professor of Ophthalmology
Faculty of Medicine – Ain Shams University

Dr. Mahmoud Ahmed EL-Samkary

Lecture of Ophthalmology
Faculty of Medicine – Ain Shams University

Dr. Radwa Mohamed Nabil

Lecturer of Ophthalmology
Faculty of Medicine – Ain Shams University

*Faculty of Medicine
Ain Shams University
Cairo , Egypt
2020*

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قَالَ

لَسْبِقَانِكَ لَا عِلْمَ لَنَا
إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ
الْعَلِيمُ الْعَظِيمُ

صدق الله العظيم

سورة البقرة الآية: ٣٢



Acknowledgemettt

*First and foremost, I feel always indebted to **Allah**, the Most Beneficent and Merciful who gave me the strength to accomplish this work.*

*My deepest gratitude to my supervisor, **Prof. Dr. Saad Mohammed Rashad**, Professor of Ophthalmology, Faculty of Medicine, Ain Shams University, for his valuable guidance and expert supervision.*

*I would like to express my great and deep appreciation and thanks to **Dr. Mahmoud Ahmed ELSamkary**, Lecturer of ophthalmolgy, faculty of Medicine, Ain Shams University, for his meticulous supervision, and his patience in reviewing and correcting this work.*

*I must express my deepest thanks to **Dr. Radwa Mohamed Nabil**, Lecturer of Ophthalmology, Faculty of Medicine, Ain Shams University for guiding me throughout this work and for granting me much of her time. I greatly appreciate her efforts.*

*Iam deeply thankful to **Dr. Heba-T-Allah Isaa** Professor and head of Pathology Department , Research institute of ophthalmology and to **Dr. Fathi salah Khder** , Lecturer of Pathology , Research institute of ophthalmology for their great help, outstanding support, during the laboratory part of this work .*

*Last but not least, thanks to my **Parents** , my **Wife** , and my **Family** for their encouragement and standing by me.*



ABSTRACT

Background: Impression cytology (IC) is a technique which permits the retrieval of the outermost layer of ocular surface cells via the use of various types of filters, it is a minimally invasive method of evaluating human conjunctival epithelial cell morphology which could be utilized in the diagnosis of ocular surface diseases, such as thyroid eye disease (TED).

Objective: Assessment of immunological changes that occurred on the ocular surface especially the conjunctiva in thyroid eye disease by impression cytology.

Patients and Methods: A cross sectional observational study designed to analyze data of 40 eyes arranged into 2 groups: (Group 1: thyroid eye disease, Group 2: control) 20 eyes in each group. The study was performed in the time interval between May 2019 and December 2019.

Results: Results of our study showed that TED group Hertel exophthalmometer measurement had an average of 22.6 ± 0.98 mm while control group showed an average of 17.50 ± 0.89 , (65 %) of TED group showed stage 2 in impression cytology technique while most of control group (80%) showed stage 0, we also used this technique to discover the presence of inflammation and degree of it and we found that 80% of this group showed moderate degree of inflammation while impression cytology results of the control group showed that 80% of them were almost nil degree of inflammation.

Conclusion: Impression cytology is a minimally invasive method of evaluating ocular surface cells, considered as the 'gold standard' technique for assessing cell morphology and we can use it for detection of immunological changes occurring in conjunctiva of patients with thyroid eye disease, also to demonstrate the immune state of these patients and its difference from normal persons, and this can help in diagnosis of early stage thyroid eye disease patients.

Keywords: Impression cytology, Thyroid eye disease, Ocular surface disease

List of Contents

<i>Title</i>	<i>Page No.</i>
List of Abbreviations.....	i
List of Tables.....	ii
List of Figures	iv
Introduction	1
Aim of the Work	3
Review of literature	4
Chapter (1): Conjunctiva.....	5
Chapter (2): Thyroid eye disease	7
Chapter (3): Impression cytology	21
Patients and methods.....	34
Results	40
Discussion	51
Summary	54
Conclusion	56
Reference.....	57
Arabic summary	--

List of Abbreviations

<i>Abbr.</i>	<i>Full term</i>
CAS:	Clinical Activity Score
CT:	Computed tomography
DED:	Dry eye disease
EUGOGO:	European group of grave's orbitopathy
GD:	Graves' disease
MRI:	Magnetic resonance imaging
OSD:	Ocular surface disease
OSSN:	Ocular surface squamous neoplasia
TBII:	Thyroid-binding inhibitory immuno-globulins
TED:	Thyroid eye disease
TO:	Thyroid orbitopathy
TPO:	Thyroid peroxidase antibody
TRAb:	TSH-receptor antibodies
TSH:	Thyroid stimulating hormone
TSHR:	Thyroid stimulating hormone receptors
TSI:	Thyroid-stimulating immuno-globulins
RT-PCR:	reverse transcription polymerase chain reaction

List of Tables

<i>Table No.</i>	<i>Page No.</i>	<i>Title</i>
Table (1):		Werner's 'NO SPECS' classification..... 10
Table (2):		Clinical Activity Score (CAS)..... 10
Table (3):		The European Group on Graves' Orbitopathy severity assessment 11
Table (4):		Techniques for analyzing impression cytology specimens 25
Table (5):		Goblet and non-goblet epithelial cell characteristics of three main grading systems ⁽⁸³⁻⁸⁵⁾ 26
Table (6):		Comparison between control group and diseased group regarding age and gender of the studied patients..... 40
Table (7):		Comparison between control group and diseased group regarding visual acuity..... 41
Table (8):		Comparison between control group and diseased group regarding intraocular pressure 41
Table (9):		Comparison between control group and diseased group regarding hertel exophthalmometer measurement..... 42
Table (10):		Comparison between control group and diseased group regarding color vision and fundus examination..... 43
Table (11):		Comparison between control group and diseased group regarding impression cytology stage 44
Table (12):		Comparison between control group and diseased group regarding severity of inflammation. 47
Table (13):		Relation between Hertel exophthalmometer measurement and impression cytology stage of the studied patients..... 449
Table (14):		Relation between Hertel exophthalmometer measurement and severity of inflammation of the studied patients..... 50

List of Figures

<i>Figure No.</i>	<i>Title</i>	<i>Page No.</i>
Figure (1):	Superficial anatomy of conjunctiva	5
Figure (2):	Light micrograph of conjunctiva.....	6
Figure (3):	Magnetic resonance imaging (T1-weighted coronal image) showing bilateral asymmetric non-uniform enlargement of inferior and medial recti	15
Figure (4):	Conjunctival impression cytology sampling using the eyeprim device	22
Figure (5):	Impression cytology of normal corneal surface showing corneal epithelial cells. Normal cells are flat with a prominent nucleus and impression cytology of normal transition zone from cornea to limbus (×40, periodic acid Schiff staining).....	28
Figure (6):	Impression cytology of the conjunctival surface	30
Figure (7):	Impression cytology of the conjunctivalised corneal surface in limbal stem cell deficiency	31
Figure (8):	rtPCR image of cDNA extracted from cells obtained by impression cytology from cornea (lanes 3, 5, 7) and conjunctiva (lanes 2, 4, 6).....	32
Figure (9):	Impression cytology of the ocular surface showing dysplastic squamous cells with increased nucleus	33
Figure (10):	Impression cytology technique were done at Ain shams university clinics	38
Figure (11):	Comparison between control group and diseased group regarding intraocular pressure	42

Figure (12):	Comparison between control group and diseased group regarding Hertel exophthalmometer measurement	43
Figure (13):	Comparison between control group and diseased group regarding impression cytology stage	46
Figure (14):	Light micrograph of impression cytology specimen showing epithelial conjunctival cells (stage 2) with N/C ratio 1:4. (black arrow) Note keratinized cell with N/C ratio 1:6 with small pyknotic nucleus, squamous metaplasia (stage3) (white arrow) . (H &E x500).	46
Figure (15):	Light micrograph of impression cytology specimen showing keratinized cell with N/C ratio 1:6 with small pyknotic nucleus, squamous metaplasia (stage 3) (arrows). (H &E x500).	47
Figure (16):	Light micrograph of impression cytology specimen showing many inflammatory cells (H&E x 500).	49

INTRODUCTION

Thyroid eye disease (TED) is a chronic autoimmune disorder usually associated with Graves' disease, although it may also be rarely present in patients with autoimmune hypothyroidism and in patients who are euthyroid. Patients with TED often suffer from physical discomfort due to pain, grittiness, excessive watering and photophobia, Periorbital swelling, eyelid retraction, conjunctival redness, proptosis and squint can cause distressing facial disfigurement. Furthermore, diplopia caused by the involvement of extraocular muscles and rarely loss of sight due to corneal scarring or optic nerve compression may lead to disabling visual impairment. ^(1,2)

The physical discomfort, facial disfigurement and impaired visual function associated with TED could have a major impact on patients' employment, hobbies and psychosocial function ^(1,2)

One of the leading causes of ocular surface damage in thyroid eye disease (TED) is dry eye syndrome. According to previous studies the incidence of this condition in TED patients varies between 45 and 85%. ⁽³⁾