Recent advances in the Ophthalmological Uses of Interferon

Essay

Submitted for partial fulfillment for
Master degree in ophthalmology

Presented by

Mohammed Ahmed Ghazy Ahmed

M.B.B.Ch

Supervised by

Prof. Doctor AhmedAbd-AllahDarwish

Professor of ophthalmology – Faculty of medicine
Ain shams university

Asis. Prof. ThanaaHelmy Mohammed

Asiss.Prof. of ophthalmology – Faculty of medicine
Ain shams university

Faculty of medicine
Ain shams university
Cairo-Egypt
2015

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Acknowledgment

Thanks to "**ALLAH"**from the start to the end of this work, without his aid this work would not have been possible.

First I would like to dedicate this work to my parents and my wife, without them none of this would have been possible, so I would like to express my great thanks for their constant support and endless care of me.

I am extremely grateful to**Prof. Dr. Ahmed Darwish**&**Prof. Dr. ThanaaHelmy**for their kind supervision, valuable guidance, continuous encouragement and endless cooperation through this work.

Avery sincere thanks to Prof. **Dr. MoatazAttia,** the great teacher who teaches me everything I know about ophthalmology and always supports me to be better and better.

I would like to dedicate this work also to **Prof. Dr. MagdyElhefnawy** (The God Father) not only in the medical filed but in all fields of life. He devoted his life to the young doctors.

Mohammed Ahmed Ghazy

LIST OF ABBREVIATIONS

2',5'OAS	**2', 5' oligoadenylatesynthetase**
21YLTF	**21Year long term follow up**
5-FU	**5-fluorouracil**
AAV	**Adeno-Associated Virus**
AIDS	**acquired immune deficiency syndrome**
AMD	**Age related Macular Degeneration**
AMP	**adenosine monophosphates**
ARVO	**Association for Research in Vision and Ophthalmology**
BCC	**Basal Cell Carcinoma**
BCG	**bacillus Calmette-Guérin**
BCVA	**Best corrected visual acuty**
BD	**Behcet's Disease**
BENEFIT	**Betaseron in Newly Emerging Multiple Sclerosis for Initial Treatment**
bFGF	**basic Fibroblast Growth Factor**
C5a	**Complement 5a**

CGD	**Chronic Granulomatous Disease**
CGs	**Conjunctival goblet cells**
CHAMPIONS	**the Controlled High Risk Avonex Multiple Sclerosis Prevention Study in Ongoing Neurologic Surveillance**
CHAMPS	**The Controlled High-Risk Subjects Avonex Multiple Sclerosis Prevention Study**
CIN	**Conjunctival Intraepithelial Neoplasia**
CIS	**carcinoma in situ**
CKIs	**Cyclin-dependent Kinase Inhibitors**
CME	**Cystoid Macular Edema**
CMT	**Central macular thickness**
CNV	**Choroidal Neovascularization**
CR	**Complete remission**
CSA	**Cyclosporine A**
DME	**Diabetic macular edema**
DMTs	**Disease modifying therapies**
dsRNA	**double-stranded RNA**
ED	**Encephalomyelitis Disseminate**

eIF2	**eukaryotic initiation factor 2**
ETOMS	**The Early Treatment of Multiple Sclerosis study**
FFA	**Fluorescence Fundus Angiography**
HCV	**Hepatitis C Virus**
HPV	**Human Papillomavirus**
HRQoL	**Health related quality of life**
HSIL	**High-grade squamous intraepithelial lesion**
HSV	**Herpes Simplex Virus**
IFN	**Interferon**
IFNAR	**IFN alpha receptor**
IFNGR	**Interferon Gamma Receptor**
Ig	**Immunoglobulin**
IL	**Interleukin**
IMP	**inosine monophosphate**
INOS	**Inducible Nitric Oxide Synthase**
IRF	**interferon regulatory factor**
ISGF	**interferon stimulated gene factor**

ISGs	**interferon stimulated genes**
ISRE	**interferon-stimulated response element**
IUSG	**International uveitis study group**
IV	**Intra vitreal**
JAK	**Janus kinase**
KMS	**Kasabach-Merritt Syndrome**
LSIL	**Low-grade squamous intraepithelial lesion**
MALT	**Mucosa associated lymphoid tissue**
MHC	**Major histocompatibility complex**
MIU	**Million International Units**
MMC	**mitomycin C**
MS	**multiple sclerosis**
Mtb	**Mycobacterium Tuberculosis**
MXT	**Methotrexate**
NAB	**Neutralizing antibodies**
NHL	**Non-Hodgkin's Lymphoma**
nHuIFN-alpha	**Natural Human Interferon-alpha**
NK	**Natural Killer**

OSSN	**Ocular surface squamous neoplasia**
PEG IFN	**Pegylated Interferon**
PKR	**Protein Kinase R**
PR	**Partial remission**
RebiQoL	**Rebifs Quality of Life**
rIFNgamma	**recombinant human gamma interferon**
RNaseL	**Ribonuclease L**
RRMS	**Relapsing-Remitting Multiple Sclerosis**
SD-OCT	**Spectral domain ocular coherence tomography**
STAT	**Signal Transduction and Activator of Transcription**
TGF	**Tumor growth factor**
Th1	**T helper one**
TLR3	**Toll-like receptor 3**
TNF	**Tumor necrosis factor**
TYK	**tyrosine kinase**
VEGF	**Vascular endothelial growth factor**
VKH	**Vogt Koyanagi Harada**

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Introduction

Interferons are natural chemical messengers or cytokines that play an important rule in the body's immune response to foreign pathogens, specially viruses and cancerous cells **(Soos&Szenete 2003).**

In 1957, Isaacs &Lindenmann took the 1st step in recognizing the activities of the IFNs, especially type I IFN. In check chorioallontoic membrane, they observed a marked inhibition of the replication of influenza virus **(Soos&Szenete 2003).**

They are characterized by their ability to interfere with viral replication, tumor cell proliferation, and alter immunity. So they are used in treatment of viral infection, some types of tumors, and also some autoimmune diseases. ***(Adla et al, 2008).***

Based on the type of receptor through which they signal, human interferons have been classified into three major types; Type I (alpha, beta and omega), Type II (gamma), Type III (lambda) **(Liu, 2005; Highleyman, 2007).**

Type I IFNs have a therapeutic potential for the treatment of a wide variety of leukemia and solid tumors due to their anti- proliferative and apoptotic effects, their anti-angiogenic effects and their ability to modulate an immune response specifically. In combination with ribavirin, IFNα-2b is the main treatment now for hepatitis C virus**(Mossman, 2011).**