The Role of Dexamesthasone Intra-Vitreal Implant in Management of Various Causes of Macular Oedema

Essay

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Heba Ahmed Abd El-Aziz Kishar

Dedication

To:

My parents

for their endless love, support,

and continuous care

My Husband

&

My Family

List of Contents

List of Tables

List of Figures

List of Figures cont...

List of Abbreviations

Abb.	Full term
AIDS	*Acquired Immune Deficiency Syndrome*
AMD	*Age Related Macular Degeneration*
BAB	*Blood Aqueous Barrier*
BCVA	*Best Corrected Visual Acuity*
bFGF	*Basic Fibroblast Growth Factor*
BRB	*Blood Retinal Barrier*
BRVO	*Branch Retinal Vein Occlusion*
CFT	*Central Foveal Thickness*
CME	*Cystoid Macular Edema*
CMT	*Central Macular Thickness*
CMV	*Cytomegalo Virus*
CNV	*Choroidal Neo Vascularization*
COX	*Cyclooxygenase*
CRT	*Central Retinal Thickness*
CRVO	*Central Retinal Vein Occlusion*
CSME	*Clinical Significant Macular Edema*
DDS	*Drug Delivery System*
DM	*Diabetes Mellitus*
DME	*Diabetic Macular Edema*
DR	*Diabetic Retinopathy*
ELM	*External Limiting Membrane*
ETDRS	*Early Treatment Diabetic Retinopathy Study*
EVA	*Ethylene Vinyl Acetate*
FA	*Fluorescin Angiography*
FAME	*Fluocinolone Acetenoid in Diabetic Macular Edema*
FDA	*Food and Drug Administration*
Fig	*Figure*
HAART	*Highly Active Anti-Retroviral Therapy*
ICAM-1	*Inter Cellualar Adhesion Molecule-1*

List of Abbreviations cont...

Abb.	Full term
ILM	*Internal Limiting Membrane*
IOP	*Intra Ocular Pressure*
IVB	*Intravitreal Bevacizumab*
IVTA	*Intravitreal Triamcinilone Acetenoid*
ME	*Macular Edema*
MMPS	*Matrix Metalloproteinases*
Nd:YAG	*Neodymium Yttrium Aluminum Garnet*
NSAIDs	*Non Steroidal Anti-inflammatory Drugs*
OCT	*Optical Coherence Tomography*
PGA	*Poly Glycolic Acid*
PLA	*Poly Lactic Acid*
PLGA	*Poly (Lactic-co-Glycolic) Acid*
PPV	*Pars Plana Vitrectomy*
PRP	*Pan Retinal Photocoagulation*
PVA	*Poly Venyl Alchol*
RCT	*Randomized Controlled Trial*
RPE	*Retinal Pigment Epithelium*
RVO	*Retinal Vein Occlusion*
TA	*Triamcinolone Acetenoid*
USA	*United States of America*
VA	*Visual Acuity*
VEGF	*Vascular Endothelial Growth Factor*
VMT	*Vitreomacular Traction*

INTRODUCTION

Cystoid macular edema (CME) is a painless disorder, which affects the central retina or macula , it is Caused by cystic accumulation of intraretinal fluid in the outer plexiform and inner nuclear layers of the retina as a result of the breakdown of the blood retinal barrier.

Also has been recognized as the most common cause of decreased vision postoperatively in uneventful cataract surgery.

CME may be a serious consequence of numerous ocular procedures and conditions, including cataract surgery, ocular inflammatory disease, retinal vascular diseases, and tractional disorders, it could be present with symptoms of blurred or decreased central vision **(Cho and Madu, 2009).**

There are many options in treating macular edema including: Non-steroidal anti-inflammatory drugs, Carbonic anhydrase inhibitor, Anti vascular endothelial growth factor" Anti -VEGF" drugs, steroids, Laser photocoagulation and vitrectomy ***(Rotsos and Moschos, 2008).***

Steroids inhibit the formation of both prostaglandins and leukotrienes and decrease intracellular and extracellular edema by suppression of macrophage activity, vasoconstrictive effect and reduction of lymphokine production and downregulation of production of vascular endothelial growth factor (VEGF) ***(Schwartz et al., 2013).***

The Ozurdex® (Allergan, Inc,) dexamethasone drug delivery system (DDS) is a biodegradable intravitreal implant that delivers sustained release of 700 μg of preservative free dexamethasone to the retina and vitreous. It is approved by the United States Food and Drug Administration as a first-line therapy for the treatment of macular edema following branch or central retinal vein occlusion, as well as for noninfectious posterior uveitis. Also it is indicated for treatment of diabetic macular edema ***(Cabrera et al., 2014).***

AIM OF THE WORK

The purpose of this essay is to elicit the role of Dexamesthasone intra-vitreal implant in the management of macular edema and illustrating, reviewing its actions and possible adverse effects.

MACULAR EDEMA

Macular edema is the result of an accumulation of fluid in the retinal layers around the fovea. It contributes to vision loss by altering the functional cell relationship in the retina and promoting an inflammatory reparative response ***(Coscas et al., 2010).***

The histopathological picture of this condition is an accumulation of fluid in the outer plexiform (Henle's) and inner nuclear and plexiform layers of the retina. The increase in water content of the retinal tissue characterizing macular edema may be intracellular or extracellular. Intracellular accumulation of fluid, also called cytotoxic edema, is an alteration of the cellular ionic distribution. Extracellular accumulation of fluid, which is more frequent and clinically more relevant, is directly associated with an alteration of the blood retinal barrier (BRB) ***(Coscas et al., 2010).***

I. Diagnosis

The clinical evaluation of macular edema has been difficult to characterize, but evaluation has become more precise with the help of modern imaging such as Fluorescein Angiography (FA) and optical coherence tomography (OCT) ***(Staurenghi et al., 2010).***

Direct and Indirect Ophthalmoscopy:

Direct and indirect ophthalmoscopy may show only an alteration of the foveal reflexes. Slit lamp biomicroscopy and stereoscopic fundus photography have played an important role in demonstrating changes in retinal volume in the macular area, but they are dependent on the observer's experience, and the results do not offer a reproducible measurement of the volume change ***(Gonzalez et al., 1995).***

The Early Treatment Diabetic Retinopathy Study specified the following characteristics as indicating clinically significant Diabetic macular edema:

1. Thickening of the retina within 500μm of the center of the macula.
2. Hard exudates at or within 500μm of the center of the macula associated with thickening of the adjacent retina.
3. A zone or zones of retinal thickening 1 disc in area or larger in size, any part of which is within 1 disc diameter of the center of the macula. This definition of macular edema specifically takes into consideration the involvement of the center of the macula and its relationship to visual loss ***(Rotsos and Moschos, 2008).***

Fluorescein Angiography:

FA contributes to our understanding of vascular retinopathy. FA will help for the identification of areas of