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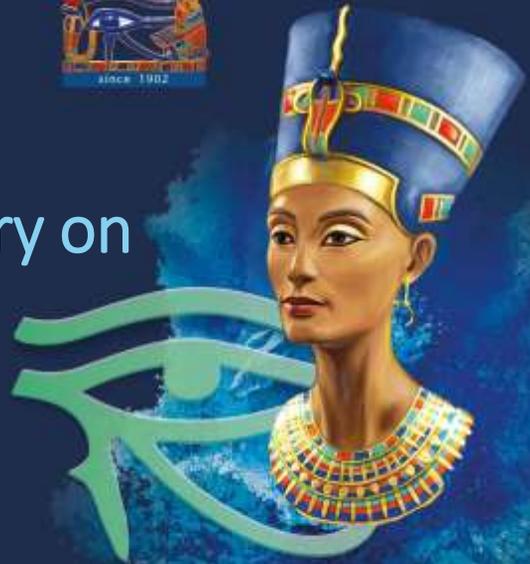
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Effect of cataract surgery on DR and DME

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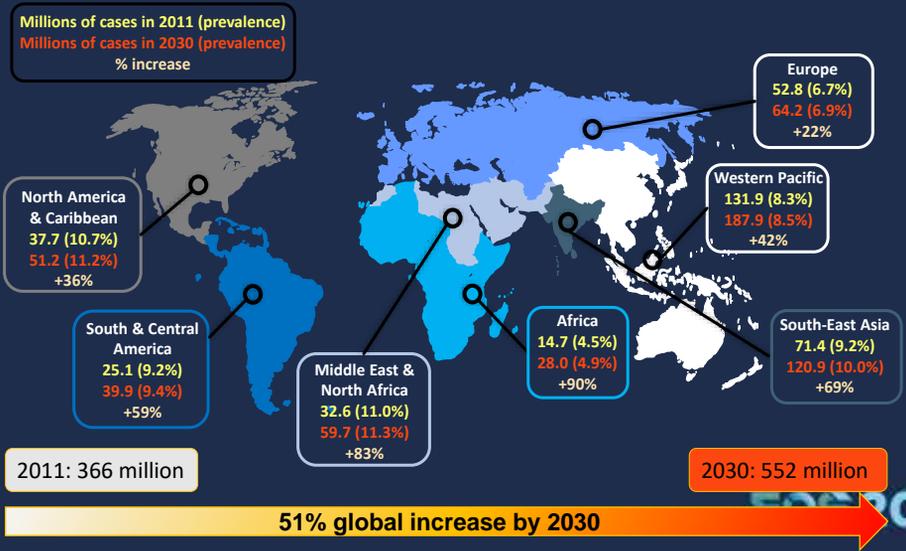
Introduction

- DR is one of the leading causes of visual impairment in EGYPT.
- DME: is defined as retinal edema threatening or involving the fovea often resulting in visual loss.
- The most common cause of visual impairment in patients with diabetes mellitus.
- It occurs mainly as a result of disruption of the blood-retinal barrier (BRB), which leads to increased accumulation of fluid within the intraretinal layers of the macula.

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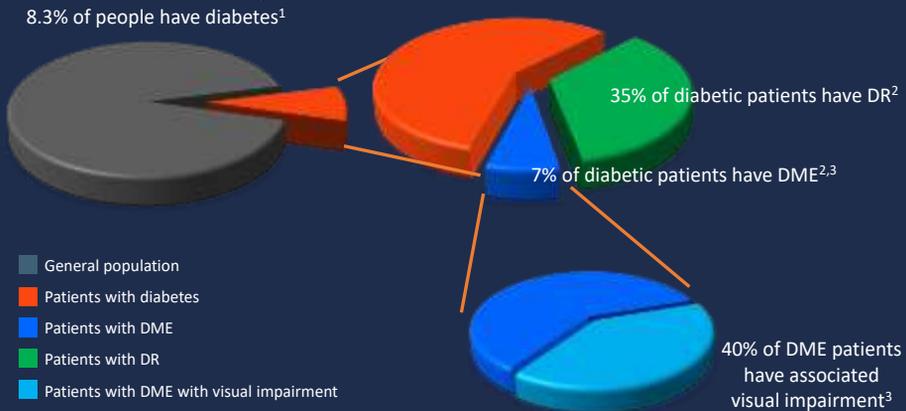


Global projections for diabetes



IDF Diabetes Atlas 5th Edition, <http://www.idf.org/diabetesatlas> [Accessed July 31, 2013]

DME: the most prevalent cause of visual impairment in patients with diabetes



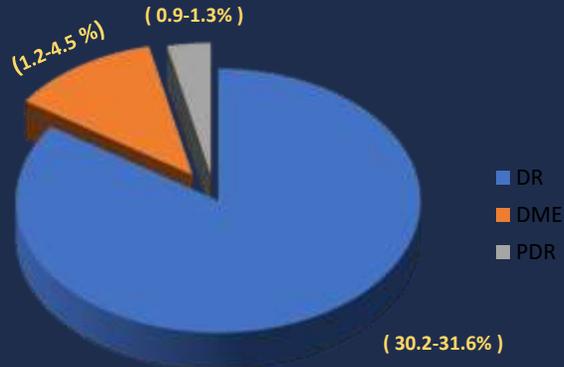
DME, diabetic macular edema
DR, diabetic retinopathy

1. IDF Diabetes Atlas. 5th Edition: <http://www.idf.org/diabetesatlas/5e/the-global-burden> [Accessed 26 July 2013]; 2. Yau J, et al. Diabetes Care 2012;35:556-64; 3. Minassian D, et al. Br J Ophthalmol 2012;96:345-9

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Epidemiology of diabetic retinopathy and maculopathy in Africa: a systematic review includes Egypt

- A Population-based studies



Burgess PJ, MacCormick IJ, Harding SP, Bastawrous A, Beare NA, Garner P. Epidemiology of diabetic retinopathy and maculopathy in Africa: a systematic review. Diabet Med. 2013 Apr;30(4):399-412.

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Pathogenesis

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Pathogenesis

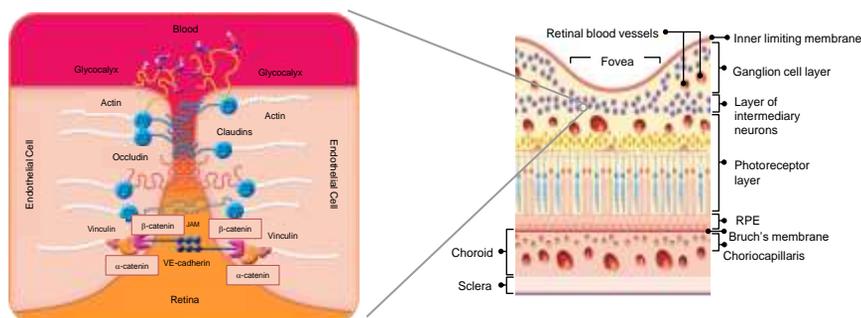
- The disease evolves as a continuous progression of retinovascular damage leading to:
 - Decompensation of the Blood Retinal Barrier (BRB)
 - Loss of pericytes
 - Basement membrane thickening
 - Changes that favor capillary occlusion and retinal non-perfusion.



Tight junctions maintain integrity of the inner and outer BRB



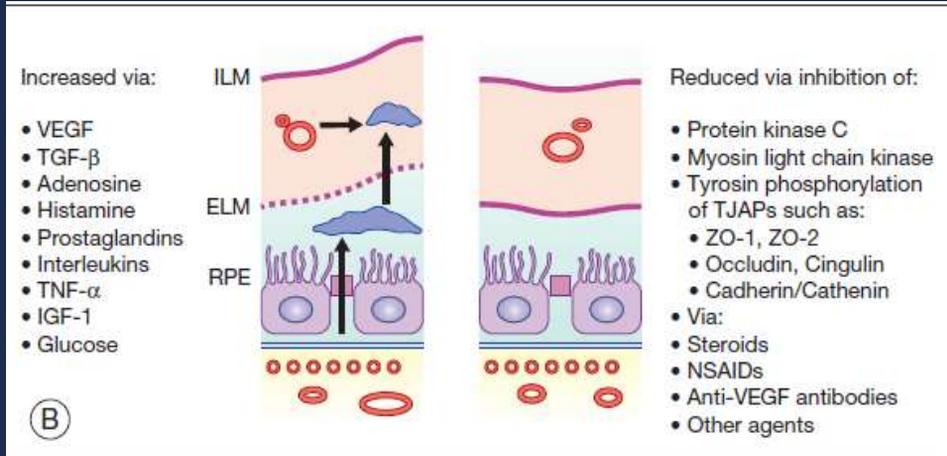
- Injury to the retina vasculature will initiate an inflammatory response¹
- Breakdown of the BRB due to immune mechanisms has been implicated in a variety of retinal diseases^{2,3}



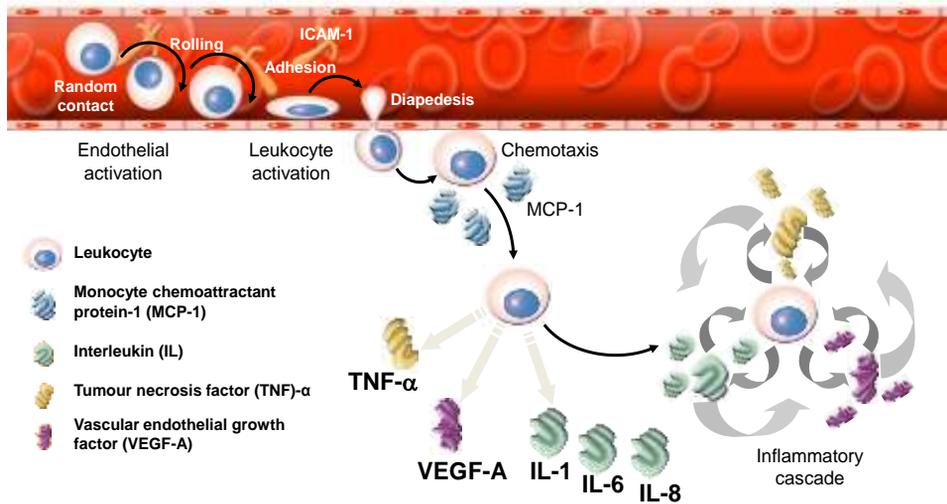
Example of tight junctions that form the outer BRB

1. Dick JSB, Jampol LM, Haller JA. In: Ryan SJ (ed). *Retina* (4th edn). Oxford: Elsevier Mosby, 2006.
 2. Crane UJ, Liversidge J. *Semin Immunopathol* 2008;30:165-77.
 3. Funatsu H, et al. *Ophthalmology* 2003;110:1690-6.

B. Role of Vasoactive Factors



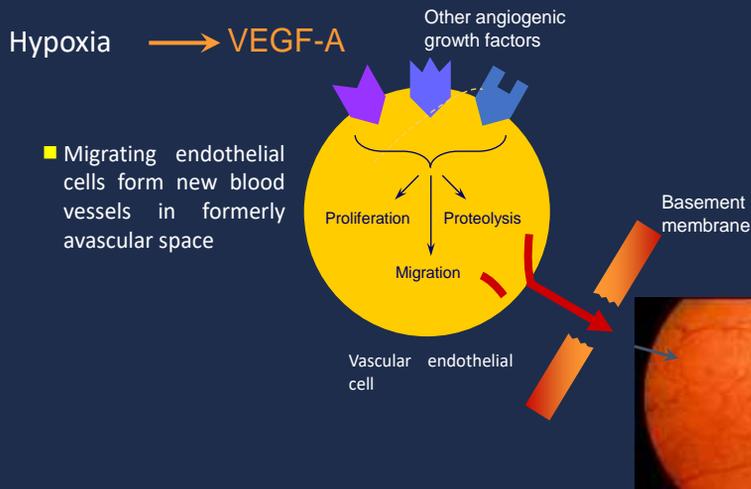
Various pro-inflammatory mediators are involved in the inflammatory cascade



Adapted from: Marieb E, Hoehn K (eds). *Human Anatomy and Physiology* (7th edn). Pearson International Edition, 2007.

ICAM: intracellular adhesion molecule

VEGF-A has a key role in the angiogenic cascade leading to neovascularization and permeability



Effect of cataract surgery on DR and DME

Study	Population	Intervention	Comparison	Outcome Measure	Method
Krepler, et al.	42 diabetic patients for unilateral cataract surgery	Phacoemulsification and in-the-bag implantation of an intraocular lens (IOL)	Unoperated fellow eye	Progression of diabetic retinopathy (EDTRS classification)	Prospective, case control
Squirrel, et al.	50 diabetic patients for unilateral cataract surgery	Phacoemulsification and in-the-bag implantation of an intraocular lens (IOL)	Unoperated fellow eye	Progression of diabetic retinopathy (EDTRS classification)	Prospective, case control
Flesner, et al.	39 diabetic patients for unilateral cataract surgery	Phacoemulsification and in-the-bag implantation of an intraocular lens (IOL)	Unoperated fellow eye	Progression of diabetic retinopathy (EURODIAB IDDM complications study grading system)	Prospective, case control
Kato, et al.	66 diabetic patients for unilateral cataract surgery	Phacoemulsification and in-the-bag implantation of an intraocular lens (IOL)	Unoperated fellow eye	Progression of diabetic retinopathy (Fukuda Classification)	Prospective, case control
Wagner, et al.	205 diabetic patients for unilateral cataract surgery	Phacoemulsification and in-the-bag implantation of an intraocular lens (IOL)	Unoperated fellow eye	Progression of diabetic retinopathy (EDTRS classification)	Prospective, case control

Effect of cataract surgery on DR and DME

Theories proposed to be implicated:

- Increase of the intraocular levels of various inflammatory mediators as cytokines and IL-6.
- Increase aqueous levels of VEGF-A.
- Forward movement of the iris-lens diaphragm causing traction on the inner retinal surface.



Risk factors

Preoperative risks:

- Duration of DM
- Control of DM (HBA1C)
- Coexisting morbidities: hypertension, dyslipidemia, renal disease
- Level of retinopathy
- Under-treatment of DR
- Presence of vitreoretinal interface abnormalities (ERMs)



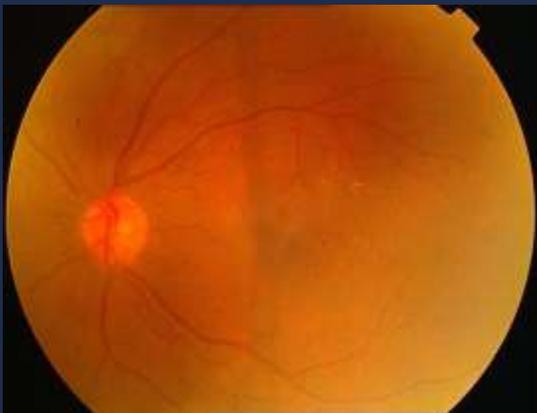
Risk factors

Intraoperative risks:

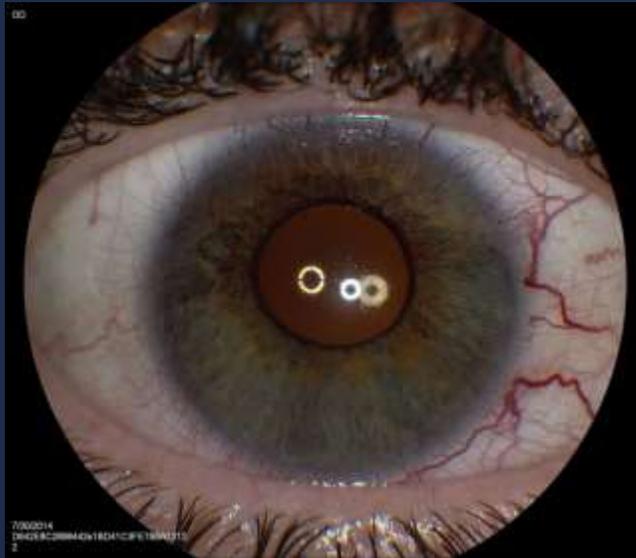
- Type of cataract surgery (Phacoemulsification, ECCE)
- Duration of surgery
- Intraoperative complication (PC rent)
- Iris trauma
- Adequate removal of all cortical material
- Type of the IOL used (?? ACIOLs)
- IOL material
- Adequate removal of all Viscoelastic



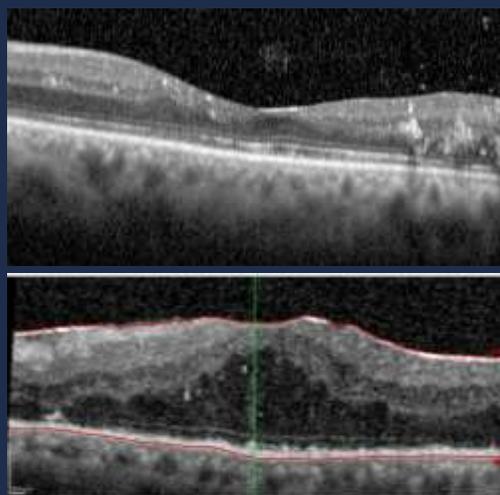
Presentations



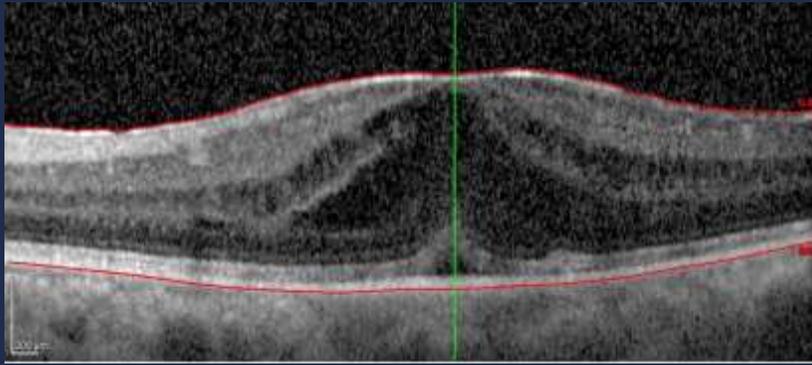
Presentations



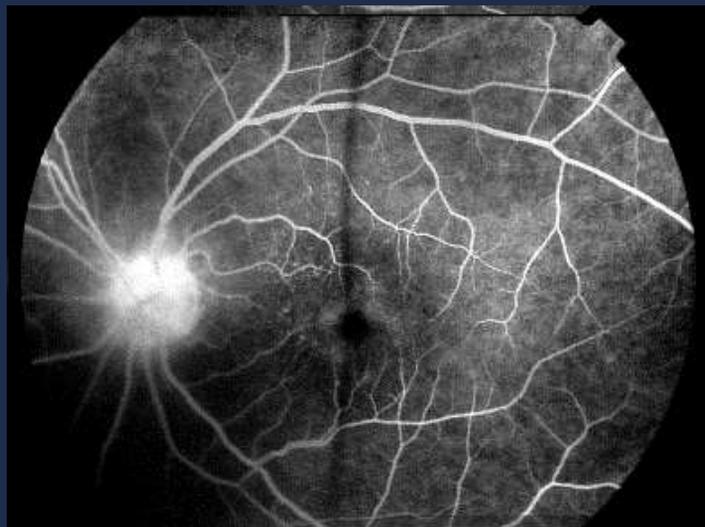
Presentations



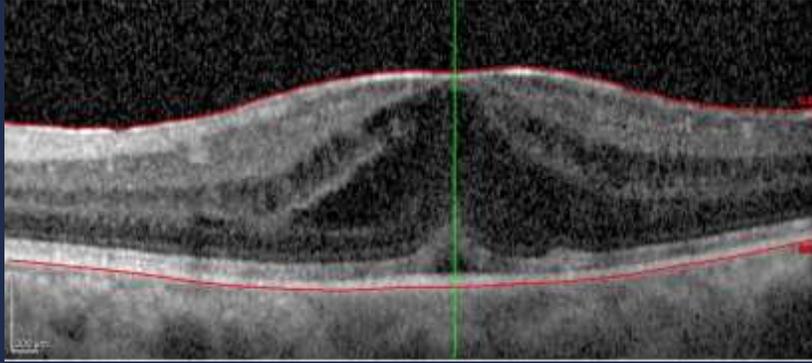
Presentations



Fluorescein Angiography



Presentations



Irvine - Gass Syndrome



How to maximize your results in diabetic cataract extraction



Preoperative considerations

- Adequate glycemic control
- Control of coexisting comorbidities (Hypertension, Dyslipidemia, renal)
- Control of diabetic retinopathy:
 - Anti-VEGF treatment for DME
 - PRP for PDR and severe NPDR whenever the media opacity permits
- Use of topical NSAIDs one week before operation and continued 3 month postoperative.



Intraoperative considerations

- Proper choice of Phacoemulsification technique.
- Proper choice of type of IOL (hydrophobic lenses)
- Avoid iris trauma or PC rent
- Combine with intravitreal injection of anti-VEGFs in cases of persistent macular edema or presence of retinopathy.
- The use of intracameral unpreserved Dexamethasone.



Effect of Intracameral Dexamethasone Injection at Conclusion of Cataract Surgery on Macular Thickness in Diabetics

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Design: Prospective case-control study.

Participants: 100 eyes of 100 diabetic patients undergoing cataract extraction.

Methods: 50 eyes received intracameral dexamethasone 0.4mg/0.1ml at the end of surgery and 50 eyes received sham treatment as a control group. The CMT was measured before, one month, and three months after the surgery

Conclusion: The CMT of eyes which received intracameral dexamethasone is significantly lower than the control group at the end of first postoperative month, suggesting a possible role of intracameral dexamethasone in suppressing the early inflammatory response that can be linked to post cataract surgery macular edema in diabetics. A non significant increase in the IOP has been observed in the dexamethasone injected group this makes intracameral dexamethasone injection a possible safe practice at the end of cataract extraction in diabetics.



INTRACAMERAL INJECTION OF DEXAMETHASONE VERSUS INTRAVITREAL INJECTION OF RANIBIZUMAB IN THE TREATMENT OF DIABETIC MACULAR EDEMA IN PATIENTS UNDERGOING CATARACT SURGERY

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Abstract

Diabetes mellitus (DM) comprises a group of disorders of carbohydrate and fat metabolism manifesting hyperglycemia. Diabetic retinopathy is a microangiopathy resulting from the chronic effects of the disease, retinal vascular changes dominate the clinical manifestations of disease and are directly implicated in the macular edema and neovascularization that represent the principal causes of vision loss. cataract develops and progresses more frequently, rapidly, and at an earlier age in patients with diabetes. Diabetic ME seems to be the most common reason of poor visual outcomes in diabetic patients after cataract surgery. Anti-VEGF is the current first-line therapy for CI-DME. Steroids are a suitable treatment option for DME, due to their anti-inflammatory properties. Intracameral dexamethasone injection appears to be an effective and safe practice to be adopted in any diabetic patient undergoing cataract surgery.

AIM OF THE WORK:

The aim of the present study was to compare the effect of intracameral dexamethasone 0.4 mg/0.1 ml injection at the conclusion of cataract surgery extraction to diabetic patients with diabetic macular edema on the central macular thickness (calculated by preoperative and postoperative OCT) to the effect of intravitreal Ranibizumab injection at the conclusion of cataract extraction surgery to diabetic patients with diabetic macular edema on the central macular thickness (calculated by preoperative and postoperative OCT).



INTRACAMERAL INJECTION OF DEXAMETHASONE VERSUS INTRAVITREAL INJECTION OF RANIBIZUMAB IN THE TREATMENT OF DIABETIC MACULAR EDEMA IN PATIENTS UNDERGOING CATARACT SURGERY

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HRP	Group I (n = 20)	Group II (n = 20)	Test of sig.	P
Preoperative				
Min. – Max.	333.0 – 530.0	325.0 – 631.0	t=1.323	0.196
Mean ± SD.	389.70 ± 60.87	425.80 ± 105.78		
One month postoperative				
Min. – Max.	304.0 – 426.0	297.0 – 429.0	t=0.792	0.434
Mean ± SD.	359.65 ± 46.41	297.0 – 429.0		
% of decrease	8.71 (-2.27 – 9.57)	5.47 (-5.89 – 29.63)	U – 199.0	0.978
p ₁	0.027*	0.025*		

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The use of topical NSAIDs in DME

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Current Pharmaceutical Design, 2018, 24, 4896–4902

REVIEW ARTICLE

The Role of Steroids and NSAIDs in Prevention and Treatment of Postsurgical Cystoid Macular Edema

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The use of topical NSAIDs in DME

Table 2. Risk factors for pseudophakic cystoid macular edema in eyes undergoing cataract surgery.

Risk Factor		Relative Risk (95% CI)
Diabetes	No signs of retinopathy	1.8 (1.36-2.36)
	Presence of diabetic retinopathy	6.23 (5.12-7.58)
	Presence of proliferative diabetic retinopathy	10.34 (5.13-20.85)
Epiretinal membrane		5.60 (3.45-9.07)
Retinal vein occlusion		4.47 (2.6-5.92)
Previous retinal detachment repair		3.93 (2.60-5.92)
Uveitis		2.88 (1.50-5.51)
Posterior capsule tear with or without vitreous loss		2.61 (1.57-4.34)

Source: Chu CJ, Johnston RL, Buscombe C, *et al*. Risk Factors and Incidence of Macular Edema after Cataract Surgery: A Database Study of 81984 Eyes. *Ophthalmology* 2016; 123(2): 316-323.



THANK YOU

See you next year

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