RETINA ROUNDUP

June 2022

1. Br J Ophthalmol 2022 May 9;bjophthalmol-2021-321046. doi: 10.1136/bjophthalmol-2021-321046

PREDICTORS OF MYOPIC MACULAR DEGENERATION IN A 12-YEAR LONGITUDINAL STUDY OF SINGAPORE ADULTS WITH MYOPIA

Foo LL, Xu L, Sabanayagam C, Htoon H M, Marcus Ang HN, Zhang J, Ohno-Matsui K, Cheng CY, Hoang V, Tan CS, Saw SM, Wong CW.

PURPOSE: To investigate the predictive factors for myopic macular degeneration (MMD) and progression in adults with myopia.

METHODS: We examined 828 Malay and Indian adults (1579 myopic eyes) with myopia (spherical equivalent (SE) ≤-0.5 dioptres) at baseline who participated in both baseline and 12-year follow-up visits of the Singapore Malay Eye Study and the Singapore Indian Eye Study. Eye examinations, including subjective refraction and axial length (AL) measurements, were performed. MMD was graded from fundus photographs following the Meta-Analysis for Pathologic Myopia classification. The predictive factors for MMD development and progression were assessed in adults without and with MMD at baseline, respectively as risk ratios (RR) using multivariable modified Poisson regression models. The receiver operating characteristic curve was used to visualise the performance of the predictive models for the development of MMD, with performance quantified by the area under the curve (AUC).

RESULTS: The 12-year cumulative MMD incidence was 10.3% (95% CI 8.9% to 12.0%) among 1504 myopic eyes without MMD at baseline. Tessellated fundus was a major predictor of MMD (RR=2.50, p<0.001), among other factors including age, worse SE and longer AL (all p<0.001). The AUC for prediction of MMD development was found to be 0.78 (95% CI 0.76 to 0.80) for tessellated fundus and increased significantly to an AUC of 0.86 (95% CI 0.84 to 0.88) with the combination of tessellated fundus with age, race, gender and SE (p<0.001). Older age (p=0.02), worse SE (p<0.001) and longer AL (p<0.001) were found to be predictors of MMD progression.

CONCLUSIONS: In adults with myopia without MMD, tessellated fundus, age, SE and AL had good predictive value for incident MMD. In adults with MMD, 1 in 10 eyes experienced progression over the same period. Older age, more severe myopia and longer AL were independent risk factors for progression.

DOI: 10.1136/bjophthalmol-2021-321046

PMID: 35534177

2. Ophthalmol Retina, 2022 May 6;S2468-6530(22)002160. doi:10.1016/j.oret.2022.04.023.

SPONTANEOUS RESOLUTION OF CHRONIC CENTRAL SEROUS CHORIORETINOPATHY: "FUJI SIGN"

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DOI: 10.1016/j.oret.2022.04.023.
PMID: 35533974
HYPERLINK: https://doi.org/10.1016/j.oret.2022.04.023

3. Eur J Ophthalmol. 2022 May 9;11206721221098208. doi: 10.1177/11206721221098208.

VISUAL ACUITY OUTCOME IN PATIENTS WITH SUBRETINAL HEMORRHAGE - OFFICE PROCEDURE VS. SURGICAL TREATMENT

Tiosano A, Gal-Or O, Fradkin M, Elul R, Dotan A, Hadayer A, Brody J, Ehrlich R.

PURPOSE: To evaluate the effects of intravitreal injection of tissue plasminogen activator (tPA) and gas vs. pars plana vitrectomy (PPV) surgery as first-line treatment for subretinal hemorrhage.

METHODS: Retrospective study of 107 adults treated for subretinal hemorrhage at a tertiary hospital during 2008-2019; 51 received injection of tPA and gas and 56 underwent PPV.

RESULTS: No between-group differences were found in age and sex, medical history, use of anticoagulants or antiplatelets, history of ocular surgeries, and previous use of intravitreal anti-VEGF. Overall follow-up time was longer in the PPV group (median 4.9 vs 3.28 years, $p = 0.005$). The hemorrhage was displaced in a similar percentage of patients in the tPA-and-gas group (n = 40, 78.4%) and the PPV group (n = 45, 80.4%) ($p = 0.816$). Approximately 80% of patients in the tPA-and-gas group were able to forgo PPV surgery. Visual acuity (in LogMAR) was similar in the two groups prior to the diagnosis of subretinal hemorrhage but better in the tPA-and-gas group at the end of follow-up ($p < 0.001$).

CONCLUSION: Injection of gas and tPA can be done immediately following diagnosis of subretinal hemorrhage as an office procedure. Visual acuity outcome is good, with a high rate of blood displacement. About 20% of patients might require additional PPV as secondary intervention.

DOI: 10.1177/11206721221098208

PMID: 35532042

4. Int J Retina Vitreous. 2022 Apr 21;8(1):29.doi: 10.1186/s40942-022-00379-z

FINDINGS OF UNCERTAIN SIGNIFICANCE BY OPTICAL COHERENCE TOMOGRAPHY (OCT) AS PROGNOSTIC FACTORS IN NEOVASCULAR AGE-RELATED MACULAR DEGENERATION (NAMD) TREATED WITH RANIBIZUMAB

Hayashi-Mercado R, Pérez-Montaño C, Reyes-Sánchez J, Ramírez-Estudillo A

BACKGROUND: Biomarkers hold great promise for personalized medicine as information gained from diagnostic or progression markers can be used to tailor treatment to the individual for highly effective intervention in the disease process.

METHODS: The aim of this retrospective study was to evaluate the association between visual outcome and the presence of findings of uncertain significance by optical coherence tomography (OCT) pre and post loading dose in patients with neovascular age-related macular degeneration (nAMD) treated with ranibizumab.

RESULTS: Univariate analysis revealed a higher letter gain in those with presence of onion sign (+ 5.6 ETDRS letters, p = 0.04) absence of prechoroidal cleft (+ 3.7 ETDRS letters, p = 0.04), intraretinal pseudocysts (+4.8 ETDRS letters, p = 0.002), subretinal pseudocysts (+ 4.6 ETDRS letters, p = 0.005) and choroidal caverns (+ 4.4 ETDRS, letters p = 0.0065).

CONCLUSIONS: The presence of prechoroidal cleft, intraretinal and subretinal pseudocysts and choroidal caverns were associated with lower visual gains. Moreover, we found that the onion sign is related as a biomarker of good prognostics. Trial registration Registration number: 2021R13B2. Date of registration: 01/05/2020.

DOI: 10.1186/s40942-022-00379-z
PMID: 35449032
PMCID: PMC9022246

5. Nature. 2022 May 11. doi: 10.1038/s41586-022-04709-x. Online ahead of print.

REVIVAL OF LIGHT SIGNALLING IN THE POSTMORTEM MOUSE AND HUMAN RETINA

Abbas F, Becker S, Jones BW, Mure LS, Panda S, Hanneken A, Vinberg F.

ABSTRACT

Death is defined as the irreversible cessation of circulatory, respiratory or brain activity. Many peripheral human organs can be transplanted from deceased donors using protocols to optimize viability. However, tissues from the central nervous system rapidly lose viability after circulation ceases impeding their potential for transplantation. The time course and mechanisms causing neuronal death and the potential for revival remain poorly defined. Here, using the retina as a model of the central nervous system, we systemically examine the kinetics of death and neuronal revival.

We demonstrate the swift decline of neuronal signalling and identify conditions for reviving synchronous in vivo-like trans-synaptic transmission in postmortem mouse and human retina. We measure light-evoked responses in human macular photoreceptors in eyes removed up to 5 h after death and identify modifiable factors that drive reversible and irreversible loss of light signalling after death. Finally, we quantify the rate-limiting deactivation reaction of phototransduction, a model G protein signalling cascade, in peripheral and macular human and macaque retina. Our approach will have broad applications and impact by enabling transformative studies in the human central nervous system, raising questions about the irreversibility of neuronal cell death, and providing new avenues for visual rehabilitation.

DOI: 10.1038/s41586-022-04709-x
PMID: 35545677