Macular Disease Foundation AUSTRALIA
Our focus is your vision

MD Research News

Issue 216

Tuesday 27 January, 2015

This free weekly bulletin lists the latest published research articles on macular degeneration (MD) and some other macular diseases as indexed in the NCBI, PubMed (Medline) and Entrez (GenBank) databases.

If you have not already subscribed, please email Rob Cummins at **research@mdfoundation.com.au** with 'Subscribe to MD Research News' in the subject line, and your name and address in the body of the email.

You may unsubscribe at any time by an email to the above address with your 'unsubscribe' request.

Drug treatment

Ophthalmology. 2015 Jan 14. [Epub ahead of print]

Long-Term Outcomes in Eyes Receiving Fixed-Interval Dosing of Anti-Vascular Endothelial Growth Factor Agents for Wet Age-Related Macular Degeneration.

Peden MC, Suñer IJ, Hammer ME, Sanderson Grizzard W.

PURPOSE: To report on long-term visual outcomes in patients receiving continuous fixed-interval dosing of anti-vascular endothelial growth factor (VEGF) treatment in neovascular age-related macular degeneration (AMD).

DESIGN: Single-practice retrospective chart review.

PARTICIPANTS: One hundred nine eyes with exudative AMD receiving continuous fixed-interval dosing (every 4-8 weeks) of anti-VEGF therapy (ranibizumab, bevacizumab, or aflibercept) for at least 5 years. Eyes were excluded if they averaged fewer than 6.5 injections per year.

METHODS: Snellen visual acuity was recorded at baseline and all subsequent injections. Changes from baseline were calculated at yearly intervals.

MAIN OUTCOME MEASURES: The primary outcome measure was mean change in letter score at 5, 6, and 7 years; secondary outcomes included the percentage of patients with 20/40 vision or better at 7 years and the mean change in letter score at each yearly time point based on baseline visual grouping (20/40 or better, 20/50-20/100, 20/200 or worse).

RESULTS: Forty-four, 75, and 109 patients with 7, 6, and 5 years, respectively, of continuous treatment were identified. Mean change in letter score at year 5 was +14.0 letters (P = 3.9 × 10-9), +12.2 letters at 6 years (P = 1.5 × 10-7), and +12.1 letters at 7 years (P = 3.8 × 10-5). Driving vision (20/40 or better) was achieved in 43.2% of treated eyes. Subanalysis revealed that the greatest visual gains at 5 and 7 years were seen in those patients with baseline visual acuity worse than 20/200 (+24.5 and +25.5 letters), followed by those with 20/50 to 20/100 vision (+6.7 and +6.9 letters), and finally those with 20/20 to 20/40 (+3.7 and +3.4 letters). Patients received an average of 10.5 injections per year.

CONCLUSIONS: Continuous fixed-interval dosing of anti-VEGF therapy in patients with exudative AMD results in favorable long-term preservation out to 7 years, with vision stabilizing or improving in 93.2% of eyes. Additionally, 43.2% of patients maintained driving vision in the treatment eye at 7 years compared with 10.1% at baseline. Our data suggest better outcomes with continuous therapy over published results with sporadic, as-needed therapy.

PMID: 25596618 [PubMed - as supplied by publisher]

Br J Ophthalmol. 2015 Jan 16. pii: bjophthalmol-2014-306018. doi: 10.1136/bjophthalmol-2014-306018. [Epub ahead of print]

A prospective pilot study of intravitreal aflibercept for the treatment of chronic central serous chorioretinopathy: the CONTAIN study.

Pitcher JD 3rd, Witkin AJ, DeCroos FC, Ho AC.

AIM: To evaluate the role of intravitreal aflibercept injection as a treatment for eyes with chronic central serous chorioretinopathy (CSCR).

METHODS: This prospective pilot study enrolled 12 patients with chronic CSCR who received a 6-month treatment regimen of intravitreal aflibercept. Patients were followed with monthly Early Treatment of Diabetic Retinopathy Study (ETDRS) best-corrected visual acuity (BCVA) and spectral domain optical coherence tomography (SD-OCT) with enhanced depth imaging.

RESULTS: All patients were men between 29 and 64 years (median 55). Subfoveal fluid was present on OCT for a median duration of 6 months (range 4-29 months) prior to treatment. Baseline BCVA ranged from 20/25 to 20/160 (median 20/50) with a mean of 62 (SD=13) ETDRS letters. No patients experienced serious ocular or systemic adverse events over the course of the study. Post-treatment BCVA ranged from 20/20 to 20/200 (median 20/40), with a mean of 64 (SD=16) ETDRS letters (p=0.56). At baseline, three patients (25%) had BCVA of ≥20/40 versus seven patients (58%) at the conclusion of the study. Two patients gained at least 15 ETDRS letters and no patients lost more than 15 ETDRS letters. Six of 12 patients (50%) had complete resolution of subfoveal fluid. Mean central macular thickness decreased from 400 µm (SD=104 µm) to 306 µm (SD=94 µm) (p=0.03), and mean subfoveal fluid decreased from 159 µm (SD=93 µm) to 49 µm (SD=68 µm) (p=0.02). Mean choroidal thickness decreased from 307 µm (SD=72 µm) to 263 µm (SD=63 µm) (p=0.0003).

CONCLUSIONS: Intravitreal aflibercept was well tolerated over a 6-month treatment course for chronic CSCR. No change was observed in visual acuity metrics. Anatomic trends may suggest some morphological activity, but larger controlled trials are needed.

PMID: 25595177 [PubMed - as supplied by publisher]

Acta Ophthalmol. 2015 Jan 18. [Epub ahead of print]

Flicker electroretinograms before and after intravitreal ranibizumab injection in eyes with central retinal vein occlusion.

Yasuda S, Kachi S, Ueno S, et al.

PURPOSE: To compare the amplitudes and implicit times of the flicker electroretinograms before and after an intravitreal injection of ranibizumab (IVR) in eyes with a central retinal vein occlusion (CRVO).

METHODS: We reviewed the medical records of 15 consecutive patients who had macular oedema secondary to CRVO and had received an IVR at the Nagoya University Hospital from November 2013 to July 2014. Flicker ERGs were recorded with both the RETeval™ system and a conventional ERG system before the IVR. One month after the IVR, recordings were repeated with only the RETeval™ system.

RESULTS: The mean implicit times of the flicker ERGs of the affected eyes recorded with the RETeval™ system were significantly longer than that of the fellow eyes (32.2 ± 2.6 msec versus 28.1 ± 1.2 msec, $p < 0.001$). One month after the IVR, the implicit times of the flicker ERGs of affected eyes were significantly shortened from 32.2 ± 2.6 to 30.6 ± 2.2 msec ($p < 0.001$).

CONCLUSIONS: The shortening of the implicit times of the flicker ERGs after the IVR indicates an improvement of retinal function after anti-VEGF therapy for CRVO eyes.

PMID: 25597703 [PubMed - as supplied by publisher]

Surv Ophthalmol. 2014 Dec 11. [Epub ahead of print]

Genetic predictive biomarkers of anti-VEGF treatment response in patients with neovascular age-related macular degeneration.

Fauser S, Lambrou GN.

Abstract: Anti-vascular endothelial growth factor (anti-VEGF) therapies for neovascular age-related macular degeneration (nAMD) have proven efficacy at a study-population level, although individual patient responses vary, with most of the patients responding well to anti-VEGF therapies, while a few respond poorly. The pathogenesis of AMD is known to have a genetic component, but it is unclear if any particular genotype can predict response to anti-VEGF therapy. With the advent of less expensive genotyping technology, there have been numerous studies within this area. Here we analyze potential biomarker candidates identified that could be used in a clinical setting to predict response to anti-VEGF treatment of nAMD. We analyze single nucleotide polymorphisms (SNPs) identified from 39 publications. The SNPs that appeared to be of most importance fell into two main groups: those previously associated with AMD pathogenesis and those within the signaling pathway targeted by anti-VEGF therapies. A number of small studies found evidence supporting an association between anti-VEGF treatment response and two SNPs, CFH rs1061170 and VEGFA rs699947, but results from randomized controlled trials found no such association. It is possible that, in the future, the cumulative effect of several high-risk SNPs may prove useful in a clinical setting and that other genetic biomarkers may emerge.

PMID: 25596882 [PubMed - as supplied by publisher]

Ophthalmology. 2015 Jan 15. [Epub ahead of print]

Postinjection Endophthalmitis in the Comparison of Age-Related Macular Degeneration Treatments Trials (CATT).

Meredith TA, McCannel CA, Barr C, et al, Comparison of Age-Related Macular Degeneration Treatments Trials Research Group.

OBJECTIVE: To describe the incidence and outcomes of endophthalmitis after intravitreal injections of anti-vascular endothelial growth factor agents in the Comparison of Age-Related Macular Degeneration Treatments Trials (CATT) and to assess the effect of prophylactic topical antimicrobials on incidence.

DESIGN: Cohort study within a randomized clinical trial.

PARTICIPANTS: Patients enrolled in CATT.

METHODS: Patients with neovascular age-related macular degeneration received intravitreal injections of ranibizumab or bevacizumab under 1 of 3 dosing regimens. The study protocol specified preinjection preparation to include use of a sterile lid speculum and povidone iodine (5%). Use of preinjection and postinjection antibiotics was at the discretion of the treating ophthalmologist. Patients were followed up monthly for 2 years.

MAIN OUTCOME MEASURES: Development of endophthalmitis and visual acuity.

RESULTS: Endophthalmitis developed after 11 of 18 509 injections (1 per 1700 [0.06%]; 95% confidence interval, 0.03%-0.11%), and in 11 of 1185 patients (0.93%; 95% confidence interval, 0.52-1.66). Incidence of endophthalmitis was 0.15% among injections with no antibiotic use, 0.08% among injections with preinjection antibiotics only, 0.06% among injections with postinjection antibiotics only, and 0.04% among injections with preinjection and postinjection antibiotics (P = 0.20). All eyes were treated with intravitreal antibiotics and 4 underwent vitrectomy. Among the 11 affected eyes, the final study visual acuity was 20/40 or better in 4 eyes (36%), 20/50 to 20/80 in 2 eyes (18%), 20/100 to 20/160 in 3 eyes (27%), and worse than 20/800 in 2 eyes (18%). The final visual acuity was within 2 lines of the visual acuity before

endophthalmitis in 5 eyes (45%).

CONCLUSIONS: Rates of endophthalmitis were low and similar to those in other large-scale studies. Use of topical antibiotics either before or after injection does not seem to reduce the risk for endophthalmitis.

PMID: 25600198 [PubMed - as supplied by publisher]

Ophthalmology. 2015 Jan 16. [Epub ahead of print]

Effects of Intravitreal Ranibizumab on Retinal Hard Exudate in Diabetic Macular Edema: Findings from the RIDE and RISE Phase III Clinical Trials.

Domalpally A, Ip MS, Ehrlich JS.

PURPOSE: To evaluate the effect of monthly intravitreal ranibizumab on hard exudate (HE) area and the impact of HE on visual acuity (VA) outcomes in diabetic macular edema (DME) patients using data from 2 phase III clinical trials.

DESIGN: Exploratory analyses of phase III, randomized, double-masked, sham-controlled, multicenter clinical trials.

PARTICIPANTS: Adults with DME, baseline best-corrected VA 20/40 to 20/320 Snellen equivalent, and central foveal thickness of ≥275 μm.

METHODS: Between the 2 studies, 759 patients with DME were randomized to receive monthly 0.3 or 0.5 mg intravitreal ranibizumab (Lucentis; Genentech, Inc., South San Francisco, CA) or sham injections.

MAIN OUTCOME MEASURES: Hard exudate area was assessed from color fundus stereophotographs both on an ordinal scale and using continuous estimates of areas within the Early Treatment Diabetic Retinopathy Study grid.

RESULTS: Data from 739 eyes were available for analysis. Mean baseline HE area was similar across treatment groups, ranging from 0.65 to 0.82 mm2. Through month 24, the percentage of eyes without HE increased from 20.9% to 36.3% in the sham group and from 22.1% to 61.3% and 23.6% to 62.0% in the ranibizumab 0.3-mg and 0.5-mg groups, respectively. Resolution of HE became apparent sometime after month 6 in ranibizumab-treated eyes. At baseline, there was no meaningful correlation between VA and presence or absence of HE. After baseline, there also was no consistent correlation between presence or absence of HE and change in VA over time.

CONCLUSIONS: In this exploratory analysis, monthly intravitreal ranibizumab resulted in significantly greater reduction of HE area compared with sham ($P < 0.0001$). In contrast to the rapid effects of ranibizumab on macular edema, changes in HE area were more gradual. Contrary to prior expectations, the presence and area of HE did not increase as DME resolved (either in the ranibizumab or sham groups). Importantly, baseline VA was not correlated with presence of HE, nor was the therapeutic benefit of ranibizumab on VA affected negatively by the presence of HE. These data suggest that in the context of intravitreal anti-vascular endothelial growth factor therapy, the presence of HE is not a prognostic indicator of poor visual outcomes.

PMID: 25601535 [PubMed - as supplied by publisher]

Other treatment & diagnosis

Clin Interv Aging. 2015 Jan 14;10:255-264.

Stem cell therapies for age-related macular degeneration: the past, present, and future.

Dang Y, Zhang C, Zhu Y.

Abstract: In the developed world, age-related macular degeneration (AMD) is one of the major causes of irreversible blindness in the elderly. Although management of neovascular AMD (wet AMD) has dramatically progressed, there is still no effective treatment for nonneovascular AMD (dry AMD), which is characterized by retinal pigment epithelial (RPE) cell death (or dysfunction) and microenvironmental disruption in the retina. Therefore, RPE replacement and microenvironmental regulation represent viable treatments for dry AMD. Recent advances in cell biology have demonstrated that RPE cells can be easily generated from several cell types (pluripotent stem cells, multipotent stem cells, or even somatic cells) by spontaneous differentiation, coculturing, defined factors or cell reprogramming, respectively. Additionally, in vivo studies also showed that the restoration of visual function could be obtained by transplanting functional RPE cells into the subretinal space of recipient. More importantly, clinical trials approved by the US government have shown promising prospects in RPE transplantation. However, key issues such as implantation techniques, immune rejection, and xeno-free techniques are still needed to be further investigated. This review will summarize recent advances in cell transplantation for dry AMD. The obstacles and prospects in this field will also be discussed.

PMID: 25609937 [PubMed - as supplied by publisher] PMCID: PMC4298283

Case Rep Ophthalmol. 2014 Dec 13;5(3):463-7.

Choroidal nevus in an eye with polypoidal choroidal vasculopathy.

Asao K, Hashida N, Nishida K.

PURPOSE: To report an eye with polypoidal choroidal vasculopathy (PCV) and a choroidal nevus.

METHODS: This is an observational case report.

RESULTS: A healthy 69-year-old woman was referred to the Osaka University Hospital with a diagnosis of a macular tumor. She complained of having distorted vision in her left eye. The medical history of the patient was unremarkable. At the initial examination, her best-corrected visual acuity (BCVA) was 20/20 in both eyes, and the intraocular pressure was 18 mm Hg in both eyes. A slit-lamp examination showed no abnormalities in the anterior segment of both eyes and a fundus examination of the left eye showed a slightly elevated juxtafoveal chorioretinal lesion and polyp-like reddish-orange lesions. The juxtafoveal choroidal lesion was located beneath a choroidal neovascularization (CNV). An optical coherence tomography confirmed CNV with pigment epithelial detachment (PED). Fluorescein angiography showed juxtafoveal hyperfluorescence due to CNV. Indocyanine green angiography demonstrated a branching choroidal vascular network that resembled polypoidal lesions. A fundus autofluorescence showed a mosaic pattern and a slight hyperautofluorescence at the CNV. We diagnosed the patient as having PCV. Aflibercept was injected intravitreally because of her PED. After the injection, PED improved and her visual acuity remained stable during the 12-month follow-up period.

CONCLUSIONS: In cases of PCV, FAF images are helpful in determining the status of the posterior pole. Intravitreal injections of aflibercept can improve PED associated with CNV, and the BCVA will remain stable for at least 12 months.

PMID: 25606040 [PubMed] PMCID: PMC4296248

Acta Ophthalmol. 2015 Jan 21. [Epub ahead of print]

New rarebit vision test captures macular deficits hidden to acuity tests.

Winther C, Frisén L.

PURPOSE: Evaluation of a new personal-computer-based vision test aimed for rapid and accurate assessment of macular conditions such as age-related macular degeneration (AMD).

METHODS: The new test depends on segmented digits defined by rarebits, that is, receptive field-size bright dots briefly presented against a dark background. Digit size was fixed at 40 × 50 min of arc. Digit positions were varied at random within a 4.6 × 3.5-degree test field. There were no fixation demands. The number of rarebits per digit segment could be varied between 3 (the minimum needed for veridical perception) and 128, in 11 preset steps. The test task was to find the smallest rarebit number required to recognize the test digits. Thirty-seven patients with various stages of AMD and 25 control subjects participated in the evaluation, which also included a standard acuity test.

RESULTS: Analysis of receiver operating characteristics indicated significantly better discrimination by the rarebit test. Rarebit numbers >16 appeared to reliably indicate the presence of oedema.

CONCLUSION: The rarebit test appeared well suited for fine grading of vision in AMD. The simple set-up and the lack of fixation demands made for practicable examinations of short durations. The test is available for free on the Internet.

PMID: 25604486 [PubMed - as supplied by publisher]

Transl Vis Sci Technol. 2015 Jan 13;4(1):2. eCollection 2015.

Direct Blood Flow Measurements in a Free RPE-Choroid Graft with Phase-Resolved Doppler OCT.

van Zeeburg EJ, Braaf B, Cereda MG, et al.

PURPOSE: We directly demonstrated the revascularization in a free retinal pigment epithelium (RPE)-choroid graft with direct blood flow detection by experimental phase-resolved Doppler optical coherence tomography (PRD-OCT).

METHODS: Seven patients with age-related macular degeneration underwent an RPE-choroid graft translocation in a prospective institutional cohort study. Spectral domain optical coherence tomography (SD -OCT) was used to measure the revascularization stage. With PRD-OCT the presence of flow was imaged postoperatively.

RESULTS: The PRD-OCT confirmed flow in three patients when SD-OCT indicated the afferent vessel ingrowth stage, and in all seven patients when the SD-OCT indicated the efferent vessel ingrowth stage.

CONCLUSIONS: The PRD-OCT study was able to detect the presence of blood flow in a free RPE-choroid graft. The PRD-OCT findings directly confirmed the revascularization that was otherwise based on the more circumstantial evidence provided by SD-OCT images and angiography.

TRANSLATIONAL RELEVANCE: The use of both techniques to monitor the revascularization process in a free graft in patients are an interesting example of replacing more invasive by noninvasive techniques. There is potential future use of PRD-OCT for the visualization of vascularization patterns in other pathologies.

PMID: 25599010 [PubMed] PMCID: PMC4294068

Pathogenesis

EMBO Mol Med. 2015 Jan 20. pii: e201404524. doi: 10.15252/emmm.201404524. [Epub ahead of print]

Apolipoprotein E promotes subretinal mononuclear phagocyte survival and chronic inflammation in age-related macular degeneration.

Levy O, Calippe B, Lavalette S, et al.

Abstract: Physiologically, the retinal pigment epithelium (RPE) expresses immunosuppressive signals such as FAS ligand (FASL), which prevents the accumulation of leukocytes in the subretinal space. Age-related macular degeneration (AMD) is associated with a breakdown of the subretinal immunosuppressive environment and chronic accumulation of mononuclear phagocytes (MPs). We show that subretinal MPs in AMD patients accumulate on the RPE and express high levels of APOE. MPs of Cx3cr1-/- mice that develop MP accumulation on the RPE, photoreceptor degeneration, and increased choroidal neovascularization similarly express high levels of APOE. ApoE deletion in Cx3cr1-/- mice prevents pathogenic age- and stress-induced subretinal MP accumulation. We demonstrate that increased APOE levels induce IL-6 in MPs via the activation of the TLR2-CD14-dependent innate immunity receptor cluster. IL-6 in turn represses RPE FasL expression and prolongs subretinal MP survival. This mechanism may account, in part, for the MP accumulation observed in Cx3cr1-/- mice. Our results underline the inflammatory role of APOE in sterile inflammation in the immunosuppressive subretinal space. They provide rationale for the implication of IL-6 in AMD and open avenues toward therapies inhibiting pathogenic chronic inflammation in late AMD.

PMID: 25604058 [PubMed - as supplied by publisher]

Physiol Rep. 2015 Jan 19;3(1).

Expression of pigment epithelium-derived factor and thrombospondin-1 regulate proliferation and migration of retinal pigment epithelial cells.

Farnoodian M, Kinter JB, Yadranji Aghdam S, et al.

Abstract: Age-related macular degeneration (AMD) is the leading cause of vision loss among elderly. Although the pathogenesis of AMD is associated with retinal pigmented epithelium (RPE) dysfunction and abnormal neovascularization the detailed mechanisms remain unresolved. RPE is a specialized monolayer of epithelial cells with important functions in ocular homeostasis. Pathological RPE damage contributes to major ocular conditions including retinal degeneration and irreversible loss of vision in AMD. RPE cells also assist in the maintenance of the ocular angiogenic balance by production of positive and negative regulatory factors including vascular endothelial growth factor (VEGF), thrombospondin-1 (TSP1), and pigment epithelium-derived factor (PEDF). The altered production of PEDF and TSP1, as endogenous inhibitors of angiogenesis and inflammation, by RPE cells have been linked to pathogenesis of AMD and choroidal and retinal neovascularization. However, lack of simple methods for isolation and culture of mouse RPE cells has resulted in limited knowledge regarding the cell autonomous role of TSP1 and PEDF in RPE cell function. Here, we describe a method for routine isolation and propagation of RPE cells from wild-type, TSP1, and PEDF-deficient mice, and have investigated their impact on RPE cell function. We showed that expression of TSP1 and PEDF significantly impacted RPE cell proliferation, migration, adhesion, oxidative state, and phagocytic activity with minimal effect on their basal rate of apoptosis. Together, our results indicated that the expression of PEDF and TSP1 by RPE cells play crucial roles not only in regulation of ocular vascular homeostasis but also have significant impact on their cellular function.

PMID: 25602019 [PubMed]

Proc Natl Acad Sci U S A. 2015 Jan 20. [Epub ahead of print]

Identification of hydroxyapatite spherules provides new insight into subretinal pigment epithelial deposit formation in the aging eye.

Thompson RB, Reffatto V, Bundy JG, et al.

Abstract: Accumulation of protein- and lipid-containing deposits external to the retinal pigment epithelium

(RPE) is common in the aging eye, and has long been viewed as the hallmark of age-related macular degeneration (AMD). The cause for the accumulation and retention of molecules in the sub-RPE space, however, remains an enigma. Here, we present fluorescence microscopy and X-ray diffraction evidence for the formation of small (0.5-20 μm in diameter), hollow, hydroxyapatite (HAP) spherules in Bruch's membrane in human eyes. These spherules are distinct in form, placement, and staining from the well-known calcification of the elastin layer of the aging Bruch's membrane. Secondary ion mass spectrometry (SIMS) imaging confirmed the presence of calcium phosphate in the spherules and identified cholesterol enrichment in their core. Using HAP-selective fluorescent dyes, we show that all types of sub-RPE deposits in the macula, as well as in the periphery, contain numerous HAP spherules. Immunohistochemical labeling for proteins characteristic of sub-RPE deposits, such as complement factor H, vitronectin, and amyloid beta, revealed that HAP spherules were coated with these proteins. HAP spherules were also found outside the sub-RPE deposits, ready to bind proteins at the RPE/choroid interface. Based on these results, we propose a novel mechanism for the growth, and possibly even the formation, of sub-RPE deposits, namely, that the deposit growth and formation begin with the deposition of insoluble HAP shells around naturally occurring, cholesterol-containing extracellular lipid droplets at the RPE/choroid interface; proteins and lipids then attach to these shells, initiating or supporting the growth of sub-RPE deposits.

PMID: 25605911 [PubMed - as supplied by publisher]

Curr Eye Res. 2015 Jan 22:1-9. [Epub ahead of print]

Plasma Homocysteine and Asymmetrical Dimethyl-l-Arginine (ADMA) and Whole Blood DNA Methylation in Early and Neovascular Age-Related Macular Degeneration: A Pilot Study.

Pinna A, Zinellu A, Tendas D, Blasetti F, Carru C, Castiglia P.

Abstract Purpose/Aim: To compare the plasma levels of homocysteine and asymmetrical dimethyl-l-arginine (ADMA) and the degree of whole blood DNA methylation in patients with early and neovascular age-related macular degeneration (AMD) and in controls without maculopathy of any sort.

Materials and methods: This observational case-control pilot study included 39 early AMD patients, 27 neovascular AMD patients and 132 sex- and age-matched controls without maculopathy. Plasma homocysteine and ADMA concentrations and the degree of whole blood DNA methylation were measured. Quantitative variables were compared by Student's t-test or Mann-Whitney test. Logistic regression models were used to investigate the significance of the association between early or wet AMD and some variables.

Results: There were no significant differences in mean plasma homocysteine and ADMA concentrations and in the degree of whole blood DNA methylation between patients with early or neovascular AMD and their controls. Similarly, logistic regression analysis disclosed that plasma homocysteine and ADMA levels were not associated with an increased risk for early or neovascular AMD.

Conclusions: We failed to demonstrate an association between early or neovascular AMD and increased plasma homocysteine and/or ADMA. Results also suggest that the degree of whole blood DNA methylation is not a marker of AMD.

PMID: 25611924 [PubMed - as supplied by publisher]

Epidemiology

Acta Ophthalmol. 2015 Jan 20. [Epub ahead of print]

Cataract surgery and age-related macular degeneration. An evidence-based update.

Kessel L, Erngaard D, Flesner P, et al.

PURPOSE: Age-related macular degeneration (AMD) and cataract often coexist in patients and concerns that cataract surgery is associated with an increased risk of incidence or progression of existing AMD has been raised. This systematic review and meta-analysis is focused on presenting the evidence concerning progression of AMD in patients undergoing cataract surgery.

METHODS: We performed a systematic literature search in the PubMed, Medline, Cochrane Library and CINAHL databases. Two randomized trials and two case-control trials were identified. Quality of the studies was assessed using the Cochrane risk of bias tool, data were extracted, and meta-analyses were performed. Quality of the available evidence was evaluated using the GRADE system.

RESULTS: We found that visual acuity at 6-12 months follow-up was significantly better (6.5-7.5 letters) in eyes that had undergone cataract surgery than in unoperated eyes, but the included number of subjects was small, and hence, the quality of evidence was downgraded to moderate. We did not find an increased risk of progression to exudative AMD 6-12 months after cataract surgery [RR 3.21 (0.14-75.68)], but the included number of subjects was small, and thus, the quality of the evidence was moderate.

CONCLUSION: Cataract surgery increases visual acuity without an increased risk of progression to exudative AMD, but further research with longer follow-up is encouraged.

PMID: 25601333 [PubMed - as supplied by publisher]

Rev Panam Salud Publica. 2014 Nov;36(5):283-9.

[National survey on the prevalence and causes of blindness in Peru].[Article in Spanish]

Campos B, Cerrate A, Montjoy E, et al

OBJECTIVE: To estimate the prevalence of blindness and visual impairment among adults in Peru and to determine their causes, to evaluate the coverage and quality of the cataract surgical services and to investigate the barriers that inhibit access to these services.

METHODS: A cross-sectional population study with two-stage random cluster sampling of individuals of ≥ 50 years old, representative of the entire country, using the standard methodology of the Rapid Assessment of Avoidable Blindness. Visual acuity was assessed and the condition of the lens and posterior pole examined by direct ophthalmoscopy. Cataract surgical coverage was calculated. Its quality, as well as the causes of visual acuity < 20/60 and the barriers to accessing surgical treatment were assessed.

RESULTS: A total of 4 849 people were examined. Blindness prevalence was 2.0% (confidence interval of 95%: 1.5-2.5%). The main causes of blindness were cataract (58.0%), glaucoma (13.7%) and age-related macular degeneration (11.5%). Uncorrected refraction errors were the principal cause of moderate visual impairment (67.2%). Cataract surgical coverage was 66.9%. 60.5% of the eyes operated for cataracts achieved a visual acuity ≥ 20/60 with available correction. The main barriers to cataract surgery were the high cost (25.9%) and people being unaware that treatment was possible (23.8%).

CONCLUSIONS: The prevalence of blindness and visual impairment in Peru is similar to that of other Latin American countries. Given the low cataract surgical coverage and the aging of the population, access to the services could be improved by increasing the population education on eye health and the response capacity of the ophthalmological and cataract surgical services, and by reducing the costs of the latter.

PMID: 25604097 [PubMed - in process]

Ophthalmic Genet. 2015 Jan 23:1-6. [Epub ahead of print]

Investigating the CFH Gene Polymorphisms as a Risk Factor for Age-related Macular Degeneration in an Iranian Population.

Babanejad M, Moein H, Akbari MR, Badiei A, Yaseri M, Soheilian M, Najmabadi H.

Abstract Background: Age-related macular degeneration (AMD) is a complex disorder which results in irreversible vision loss and progressive impairment of central vision. Disease susceptibility is influenced by multiple genetic and environmental factors. Single nucleotide polymorphisms (SNP) in the complement factor H gene are the most important genetic risk factors. We conducted a case-control study to investigate the association four SNPs (dbSNP ID: rs800292, rs1061170, rs2274700 and rs3753395) of CFH gene with AMD in the Iranian population.

Materials and Methods: We recruited 100 AMD patients and 100 age- and sex-matched normal controls. Direct sequencing for three SNPs (rs800292, rs2274700 and rs3753395) and restriction fragment length polymorphism utilized for rs1061170. Allele and genotype frequencies of SNPs were calculated and tested for departure from Hardy-Weinberg equilibrium using the Chi-square test. An allelic and genotypic association was compared by logistic regression analysis using the SNPassoc.

Results: According to our results, the frequencies of risk allele for all SNPs (G, G, A, and C alleles of rs800292, rs2274700, rs3753395 and rs1061170, respectively) were significantly higher in AMD patients (p value < 0.001). AMD individuals who had at least one copy of the C allele of rs1061170 had an increased risk of disease compared with cases with the T allele. Other studied polymorphisms showed the same association.

Conclusion: Our results suggest the contribution of all four predicted CFH polymorphisms in AMD susceptibility among the Iranian population. This association with CFH may lead to early detection and new strategies for prevention and treatment of AMD.

PMID: 25612476 [PubMed - as supplied by publisher]

Diet, lifestyle and low vision

Optom Vis Sci. 2015 Jan 16. [Epub ahead of print]

Low-vision Service Provision by Optometrists: A Canadian Nationwide Survey.

Lam N, Leat SJ, Leung A.

PURPOSE: To document the degree to which Canadian optometrists are involved in the provision of low-vision (LV) care and their referral patterns. To investigate the barriers to providing optometric low-vision services (LVS).

METHODS: Practicing optometrists across Canada were randomly sampled and invited to participate in a questionnaire that included questions on personal profile, primary practice profile, levels of LV care offered, patterns of referral, and barriers to provision of LV care. Questions included a combination of multiple choice and open-ended formats, and included hypothetical cases.

RESULTS: A total of 459 optometrists responded (response rate, 24.8%). Optometrists estimated that 1% (range, 0 to 100%) of their patients were LV patients yet also estimated that 10% of their patients had acuity equal to or worse than 20/40. Thirty-five percent of respondents indicated that their primary practice offered LV care, 75.6% would manage a patient with minimum disability and simple goals themselves, whereas 10.7% would manage a patient with more than minimal visual disability who needed more specialized LV devices (e.g., telescopes, electronic aids, and custom-designed microscopes); 84.3% of optometrists would assess for basic magnification and lighting in a hypothetical patient with early age-related macular degeneration, whereas 15% would undertake full LV rehabilitation in advanced age-related macular degeneration. Optometrists commonly referred to CNIB (formerly the Canadian National Institute for the Blind), yet only 10.7% of respondents almost always received a written report after referral. Those who would not undertake LV assessment stated that they lacked the knowledge, equipment, or experience;

that LV assessment is too time consuming; and that the cost is too prohibitive.

CONCLUSIONS: This is the first comprehensive study of LVS provision by optometrists in Canada. In order for optometrists to become more involved in LVS, there is a need for more LV education, provincial health coverage of optometric LVS, and better collaboration communication between LV providers.

PMID: 25599339 [PubMed - as supplied by publisher]