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MD Research News

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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.

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Drug treatment

Expert Opin Drug Saf. 2014 Aug 5:1-12. [Epub ahead of print]

A safety evaluation of ranibizumab in the treatment of age-related macular degeneration.

Gibson JM, Gibson SJ.

Introduction: The use of intravitreal ranibizumab has transformed the outcomes for thousands of patients with wet age related macular degeneration (AMD), which is the leading cause of blindness in developed countries. Prior to its introduction, most patients with wet AMD would rapidly lose central vision. The use of intravitreal ranibizumab has been shown to reduce certifiable visual loss by about a half. Current treatment regimens with ranibizumab in wet AMD require multiple injections over several years and so it is highly relevant to review the safety record of this important drug.

Areas covered: This review considers the important ocular and systemic adverse events (AE) that have been reported in the literature, particularly in the context of the pivotal clinical trials that have been performed. It also reviews the safety of other anti-VEGF drugs that are used in wet AMD, namely bevacizumab and aflibercept, and compares these drugs with ranibizumab.

Expert opinion: Overall, intravitreal ranibizumab can be considered a safe and highly effective drug for patients with wet AMD. However recent concerns about retinal thinning following ranibizumab therapy, possible systemic AE associated with all anti-VEGF drugs and the occurrence of complications relating to drug preparation and delivery must be considered.

PMID: 25091039 [PubMed - as supplied by publisher]

Jpn J Ophthalmol. 2014 Aug 6. [Epub ahead of print]

Effects of vitreomacular adhesion on ranibizumab treatment in Japanese patients with age-related macular degeneration.

Nomura Y, Takahashi H, Tan X, Fujimura S, Obata R, Yanagi Y.

PURPOSE: To investigate the effects of vitreomacular adhesion (VMA) on intravitreal ranibizumab treatment in Japanese patients with exudative age-related macular degeneration (AMD).

METHODS: This was a retrospective comparative study that included 123 eyes from 123 patients with exudative AMD. The presence or absence of VMA was examined by spectral domain optical coherence

tomography. The association of VMA with best-corrected visual acuity (BCVA) and central retinal thickness (CRT) at 3, 6, and 12 months after ranibizumab treatment was evaluated.

RESULTS: In the group of eyes without VMA [VMA(-)], the mean BCVA was 0.41 logMAR at baseline and significantly improved to 0.28, 0.30, and 0.29 logMAR at 3, 6, and 12 months following the initiation of treatment (P < 0.0001, <0.0001, <0.0001), respectively. In the group of eyes with VMA [VMA(+)], the mean BCVA was 0.42 logMAR at baseline, and there was no improvement at any of the measurement time-points during the follow-up period [0.39, 0.40, and 0.39 logMAR at 3, 6, and 12 months (P = 0.53, 0.75, 0.67), respectively]. The mean baseline CRT in the VMA(-) and VMA(+) groups was 326 and 370 µm, respectively, decreasing to 195 and 293 µm (P < 0.0001 and P = 0.0070), respectively, at 12 months. A better baseline BCVA was associated with poor visual response to intravitreal ranibizumab.

CONCLUSIONS: Our study of Japanese patients with AMD managed in real-world clinical practice revealed that both VMA and BCVA at baseline were associated with a poor visual response to intravitreal ranibizumab. These results are in agreement with previously reported findings for other ethnic groups.

PMID: 25096269 [PubMed - as supplied by publisher]

Other treatment & diagnosis

Retina. 2014 Aug 6. [Epub ahead of print]

SUPRACHOROIDAL LAYER AND SUPRACHOROIDAL SPACE DELINEATING THE OUTER MARGIN OF THE CHOROID IN SWEPT-SOURCE OPTICAL COHERENCE TOMOGRAPHY.

Michalewska Z, Michalewski J, Nawrocka Z, Dulczewska-Cichecka K, Nawrocki J.

PURPOSE: To define the morphology of outer choroidal margins in swept-source optical coherence tomography.

METHODS: This is a prospective observational study of 180 eyes: 20 eyes of healthy volunteers, 20 eyes of myopic patients, and 20 eyes from each of the following groups: macular hole, lamellar macular hole, epiretinal membranes, drusen, dry age-related macular degeneration (AMD), neovascular AMD, and vitreomacular traction. A single 12-mm wide swept-source optical coherence tomography image for each of the examined eyes consisting of 1,024 A-scans has been created. The main outcome measure selected was to estimate the presence of suprachoroidal layer, as well as to estimate the ability to delineate the outer choroidoscleral boundary using the software available (DRI-OCT) and to determine its shape.

RESULTS: Suprachoroidal layer was observed in 5% of healthy emmetropic eyes, in 50% of eyes with full-thickness macular holes, and in 60% of eyes with vitreomacular traction syndrome. It was also present in 50% of eyes with dry AMD and in 20% of eyes with neovascular AMD. The outer margin of the choroid in all eyes of the healthy volunteers and in eyes with macular diseases has been delineated correctly. In all healthy and myopic eyes, we recognized the outer choroidoscleral boundary as having a regular shape following the natural oval contour of the globe. In eyes with epiretinal membranes, macular hole, vitreomacular traction, and AMD, the outer choroidoscleral boundary was irregular; the choroid varied in thickness from point to point.

CONCLUSION: Swept-source optical coherence tomography enables exact visualization of the outer choroidoscleral boundary. Suprachoroidal layer consisting of two bands has been recognized, the upper of which is hyperreflective and the lower of which is hyporeflective. It may be supposed that the lower hyporeflective band corresponds to suprachoroidal space, which was not earlier visualized in vivo in eyes without choroidal effusion. Suprachoroidal layer in myopic and emmetropic healthy subjects has been rarely observed. We observed it more frequently in different macular diseases.

PMID: 25102196 [PubMed - as supplied by publisher]

Retina. 2014 Aug 6. [Epub ahead of print]

STEREOTACTIC RADIOTHERAPY FOR WET AGE-RELATED MACULAR DEGENERATION (INTREPID): Influence of Baseline Characteristics on Clinical Response.

Jackson TL, Shusterman EM, Arnoldussen M, Chell E, Wang K, Moshfeghi DM.

PURPOSE: To determine which patients respond best to stereotactic radiotherapy (SRT) for neovascular age-related macular degeneration.

METHODS: Participants (n = 230) receiving intravitreal anti-vascular endothelial growth factor injections for neovascular age-related macular degeneration enrolled in a randomized, double-masked sham-controlled trial comparing 16 Gray, 24 Gray, or Sham SRT. In a post hoc analysis, participants were grouped according to their baseline characteristics, to determine if these influenced SRT efficacy.

RESULTS: At 52 weeks, SRT was most effective for lesions ≤4 mm in greatest linear dimension and with a macular volume greater than the median value of 7.4 mm. For 26% of the participants with both these characteristics, SRT resulted in 55% fewer ranibizumab injections (2.08 vs. 4.60; P = 0.0002), a mean visual acuity change that was 5.33 letters superior to sham (+2.18 vs. -3.15 letters; P = 0.0284), and a 71.1-μm greater reduction in mean central subfield thickness (-122.6 vs. -51.5 μm; P = 0.027). Other features associated with a positive response to SRT included pigment epithelial detachment and the absence of fibrosis.

CONCLUSION: Stereotactic radiotherapy is most effective for neovascular age-related macular degeneration lesions that are actively leaking at the time of treatment, and no larger than the 4-mm treatment zone.

PMID: 25102198 [PubMed - as supplied by publisher]

Ophthalmologe. 2014 Aug 6. [Epub ahead of print]

[Screening in ophthalmology : Stay healthy, recognize diseases early.][Article in German]

Neubauer AS, Hirneiß CW.

Abstract: Screening is a strategy used in a systematic approach to identify an unrecognized disease or risk factors in individuals in a population without signs or symptoms. The test characteristics (specificity and sensitivity) and the prevalence of the disease are of vital importance for the achievable quality of prediction. Multidimensional decision-making must not only consider the benefits of screening but also its potential disadvantages, such as overtreatment, diagnostics of unclear findings and the psychological impact on healthy individuals. Besides medical, ethical and test theoretical considerations, economic considerations also have to be included in decision-making on a screening program. In Germany, a nationwide screening for diabetic retinopathy and regional programs for amblyopia screening exist. Screening for glaucoma or age-related macular degeneration is currently not funded by the statutory health insurance.

PMID: 25092025 [PubMed - as supplied by publisher]

ISRN Ophthalmol. 2014 Apr 16;2014:608390. doi: 10.1155/2014/608390. eCollection 2014.

Present and possible therapies for age-related macular degeneration.

Khan M, Agarwal K, Loutfi M, Kamal A.

Abstract: Age-related macular degeneration (AMD) is the most common cause of blindness in the elderly population worldwide and is defined as a chronic, progressive disorder characterized by changes occurring

within the macula reflective of the ageing process. At present, the prevalence of AMD is currently rising and is estimated to increase by a third by 2020. Although our understanding of the several components underpinning the pathogenesis of this condition has increased significantly, the treatment options for this condition remain substantially limited. In this review, we outline the existing arsenal of therapies available for AMD and discuss the additional role of further novel therapies currently under investigation for this debilitating disease.

PMID: 25097787 [PubMed] PMCID: PMC4009180

Pathogenesis

Springerplus. 2014 Jul 14;3:356.

Overstimulation can create health problems due to increases in PI3K/Akt/GSK3 insensitivity and GSK3 activity.

Liu X.

Abstract: Aging is linked to decrease of the body cell use of growth hormone (GH) and thyroxine, whereas the decrease is via "death hormones" inhibition? This study proposes different viewpoints. Since interleukin 17 receptor C (IL17RC) is highly expressed in tissues from age-related macular degeneration (AMD) patients, IL17RC signaling pathways are explored to evaluate Wnts/vascular endothelial growth factor (VEGF) expression and complement activity, which are pathological factors in AMD. IL17RC overexpression or VEGF treatment was performed in two cell lines for up to two-day. Real-time Quantitative PCR, confocal microscopy, immune-blot, MTT assay, etc. measured downstream effects. IL17RC overexpression increases Wnts and VEGF that forms complexes with Wnt-signaling components. VEGF or the Wnt-signaling components interacting with C3 suggests alternative complement pathway activation. Moreover, IL17RC-overexpressed cells or VEGF-treated cells for two-day, which is overstimulation, increase PI3K/Akt/GSK3 insensitivity and GSK3 activity, and decrease growth/survival. High GSK3 activity associates with many chronic diseases including type II Diabetes. This study shows high GSK3 activity can result from PI3K/Akt overstimulation. Type II Diabetes shows insulin resistance that the body cells decrease insulin use. Possessing little sensitive PI3K/Akt for receptor activation, cells after overstimulation, although live, hardly respond to PI3K/Akt activators including GH, thyroxine and insulin. These results suggest an alternative explanation of the body cells declining hormone use since various kinds of cell signaling-induced overstimulation events almost always linked to PI3K/Akt, increase with age. Playing pathological roles in senescence and diseases, overstimulation eventually generates health problems.

PMID: 25089247 [PubMed] PMCID: PMC4117863

Exp Eye Res. 2014 Aug 1. pii: S0014-4835(14)00209-7.

Polyethylene glycol induced mouse model of retinal degeneration.

Lyzogubov VV, Bora NS, Tytarenko RG, Bora PS.

Abstract: Age-related macular degeneration (AMD) is a leading cause of irreversible blindness. This study was done to characterize dry AMD-like changes in mouse retinal pigment epithelium (RPE) and retina after polyethylene glycol (PEG) treatment. We injected male C57BL/6 mice subretinally with PBS, 0.025, 0.25, 0.5 and 1.0 mg of PEG-400 and the animals were sacrificed on day 5. Eyes were harvested and processed for histological analysis. In all other experiments 0.5 mg PEG was injected and animals were sacrificed on days 1, 3, 5 or 14. Paraffin, 5 μm and plastic, 1 μm and 80 nm sections were used for further analysis. Subretinal injection of 0.5 mg PEG induced a 32% reduction of outer nuclear layer (ONL) thickness, 61% decrease of photoreceptor outer and inner segment length, 49% decrease of nuclear density in the ONL

and 31% increase of RPE cell density by day 5 after injection. The maximum level of TUNEL positive nuclei in the ONL (6.8 + 1.99%) was detected at day 5 after PEG injection and co-localized with Casp3act. Histological signs of apoptosis were observed in the ONL by light or electron microscopy. Degeneration of RPE cells was found in PEG injected eyes. Gene expression data identified several genes reported to be involved in human AMD. C3, Cfi, Serping1, Mmp9, Htra1 and Lpl were up-regulated in PEG injected eyes compared to PBS controls. PEG leads to morphological and gene expression changes in RPE and retina consistent with dry AMD. This model will be useful to investigate dry AMD pathogenesis and treatment.

PMID: 25088354 [PubMed - as supplied by publisher]

Arch Soc Esp Oftalmol. 2014 Jul 31. pii: S0365-6691(14)00081-1.

Age-related macular degeneration, apnea and macrophages.[Article in English, Spanish]

Asensio-Sánchez VM.

PMID: 25087969 [PubMed - as supplied by publisher]

Epidemiology

Br J Ophthalmol. 2014 Aug 4. pii: bjophthalmol-2014-305005. doi: 10.1136/bjophthalmol-2014-305005. [Epub ahead of print]

Risk characteristics of the combined geographic atrophy and choroidal neovascularisation phenotype in age-related macular degeneration.

Saade C, Ganti B, Marmor M, Freund KB, Smith RT.

AIM: To investigate the risk characteristics of the combined geographic atrophy (GA) and choroidal neovascularisation (CNV) phenotype of age-related macular degeneration (AMD) compared to GA or CNV.

METHODS: Patients with advanced AMD were identified and divided into three groups using multimodal imaging: patients with GA in at least one eye, patients with CNV in at least one eye, and patients with simultaneous GA and CNV in at least one eye. Epidemiologic and clinical factors were gathered from patient questionnaires. Genotypes for age-related maculopathy susceptibility 2 (ARMS2) and complement factor H (CFH) were determined.

RESULTS: 42 patients with GA or CNV, and 16 patients with combined GA/CNV were identified. Patients with the combined phenotype were older (86.4 vs 81.8 years, p=0.049), and had a higher prevalence of advanced AMD in the fellow eye (81.3% vs 31.0%, p<0.001). CFH and ARMS2 risk alleles were not associated with the combined phenotype.

CONCLUSIONS: The combined GA/CNV phenotype has similar epidemiologic, clinical, and genetic features as GA and CNV, but occurs at an older age and is more associated with advanced AMD in the fellow eye, suggesting that all these phenotypes are part of the same spectrum of disease and that the combined phenotype represents an even more advanced form of AMD than either GA or CNV.

PMID: 25091949 [PubMed - as supplied by publisher]

Vestn Oftalmol. 2014 May-Jun;130(3):60-6.

[Possibilities for early diagnosis and monitoring of age-related macular degeneration].[Article in Russian]

[No authors listed]

Abstract: High prevalence of age-related macular degeneration (AMD) among older adults and treatment difficulties at later stages make early diagnosis and disease monitoring an actual problem of ophthalmology. Although methods for identification of gene-positive groups are now available, genetic studies are not sufficiently widespread in our country to ensure screening for AMD risk. In this regard there remains a need to determine the earliest objective sings of the degenerative process and progression criteria. This paper reviews anatomically oriented functional methods of retinal examination at the onset of AMD and later in the course of the disease. Analysis of collected material will provide systematic understanding of current possibilities for early diagnosis and functional monitoring of AMD patients prior to the decrease of their visual acuity.

PMID: 25098125 [PubMed - in process]

Vestn Oftalmol. 2014 May-Jun;130(3):9-13.

[Clinical and immunological factors of the onset and development of age-related macular degeneration].[Article in Russian]

[No authors listed]

Abstract: The purpose of the study is to determine the role of certain clinical and immunological factors of the onset and development of age-related macular degeneration (AMD).

MATERIALS AND METHODS: Retrospective analysis of patients records; determination of IFNalpha IFNgamma, IL-1beta, and TNFalpha cytokines levels as well as extracellular peroxidase activity (EPA) in blood serum and tear; measuring frequency of occurrence of intraocular infectious antigens with predominantly intracellular localization, such as Herpesviridae spp. (Herpes simplex, Cytomegalovirus, Epstein-Barr virus) and Chlamydiaceae spp. (Chlamydia pneumoniae, Chlamydia trachomatis) in lens matter and aqueous humor by means of polymerase chain reaction (PCR). The new evidence strongly suggests a relationship between AMD development and hypertension ($p < 0.001$; $r = +0.30$, $P < 95\%$) as well as between AMD progression and hypertension accompanied by chronic inflammation with predominantly intracellular localization of the infectious agent ($p < 0.05$ for the predisciform stage, $p < 0.001$ for the disciform and cicatrical stages; $r = +0.30$, $P < 95\%$). "Dry" AMD is characterized by hypertension-associated systemic and then local increase of EPA. In "wet" AMD it is the interferon response that is impaired: IFNalpha and IFNgamma are systemically decreased, while local level of IFNalpha is increased. Intraocular Herpes simplex infection is pathogenically significant for AMD development (18.8% in the study group vs 0% in the control group).

CONCLUSION: AMD progression is associated with hypertension accompanied by chronic inflammation with predominantly intracellular localization of the infectious agent as well as impairment of the interferon response (systemic decrease of IFNalpha and IFNgamma with local increase of IFNalpha). Moreover, the presence of intraocular Herpes simplex infection leads to activation of the first line antiviral immunity (IFNgalpha) with decompensation of the local interferon response (IFNgamma).

PMID: 25098114 [PubMed - in process]

Invest Ophthalmol Vis Sci. 2014 Aug 4;55(8):4790. doi: 10.1167/iovs.14-15135.

Measuring dark adaptation in the elderly: a predictor of who may develop macular degeneration?

Iannaccone A.

PMID: 25091414 [PubMed - in process]

Genetics

Am J Hum Genet. 2014 Aug 7;95(2):183-193. doi: 10.1016/j.ajhg.2014.07.006. Epub 2014 Jul 31.

Pathogenic Variants for Mendelian and Complex Traits in Exomes of 6,517 European and African Americans: Implications for the Return of Incidental Results.

Tabor HK, Auer PL, Jamal SM, Chong JX, Yu JH, Gordon AS, Graubert TA, O'Donnell CJ, Rich SS, Nickerson DA; NHLBI Exome Sequencing Project, Bamshad MJ.

Abstract: Exome sequencing (ES) is rapidly being deployed for use in clinical settings despite limited empirical data about the number and types of incidental results (with potential clinical utility) that could be offered for return to an individual. We analyzed deidentified ES data from 6,517 participants (2,204 African Americans and 4,313 European Americans) from the National Heart, Lung, and Blood Institute Exome Sequencing Project. We characterized the frequencies of pathogenic alleles in genes underlying Mendelian conditions commonly assessed by newborn-screening (NBS, n = 39) programs, genes associated with age-related macular degeneration (ARMD, n = 17), and genes known to influence drug response (PGx, n = 14). From these 70 genes, we identified 10,789 variants and curated them by manual review of OMIM, HGMD, locus-specific databases, or primary literature to a total of 399 validated pathogenic variants. The mean number of risk alleles per individual was 15.3. Every individual had at least five known PGx alleles, 99% of individuals had at least one ARMD risk allele, and 45% of individuals were carriers for at least one pathogenic NBS allele. The carrier burden for severe recessive childhood disorders was 0.57. Our results demonstrate that risk alleles of potential clinical utility for both Mendelian and complex traits are detectable in every individual. These findings highlight the necessity of developing guidelines and policies that consider the return of results to all individuals and underscore the need to develop innovative approaches and tools that enable individuals to exercise their choice about the return of incidental results.

PMID: 25087612 [PubMed - as supplied by publisher]

Asia Pac J Ophthalmol (Phila). 2014 May 1;3(3):181-193.

Developments in Ocular Genetics: 2013 Annual Review.

Aboobakar IF, Allingham RR.

PURPOSE: To highlight major advancements in ocular genetics from the year 2013.

DESIGN: Literature review.

METHODS: A literature search was conducted on PubMed to identify articles pertaining to genetic influences on human eye diseases. This review focuses on manuscripts published in print or online in the English language between January 1, 2013 and December 31, 2013. A total of 120 papers from 2013 were included in this review.

RESULTS: Significant progress has been made in our understanding of the genetic basis of a broad group of ocular disorders, including glaucoma, age-related macular degeneration, cataract, diabetic retinopathy, keratoconus, Fuchs' endothelial dystrophy, and refractive error.

CONCLUSIONS: The latest next-generation sequencing technologies have become extremely effective tools for identifying gene mutations associated with ocular disease. These technological advancements have also paved the way for utilization of genetic information in clinical practice, including disease diagnosis, prediction of treatment response and molecular interventions guided by gene-based knowledge.

PMID: 25097799 [PubMed] PMCID: PMC4119463 [Available on 2015/5/1]

Diet & lifestyle

Am J Ophthalmol. 2014 Aug 1. pii: S0002-9394(14)00472-3. doi: 10.1016/j.ajo.2014.07.036. [Epub ahead of print]

Omega-3 Supplementation combined with anti-VEGF Lowers Vitreal Levels of VEGF in Wet Age-Related Macular Degeneration.

Rezende FA, Lapalme E, Qian CX, Smith LE, SanGiovanni JP, Sapieha P.

PURPOSE: To determine the influence of omega-3 supplementation on vitreous vascular endothelial growth factor A (VEGF-A) levels in patients with exudative age-related macular degeneration (wet-AMD) receiving intravitreal anti-VEGF treatment.

DESIGN: Prospective, randomized, open-label, single center, clinical trial, consecutive interventional case series.

METHODS: The study included three cohorts with wet-AMD and a control group with epiretinal membrane or macular hole (ERM/MH). Twenty wet-AMD patients being treated with anti-VEGF were randomized to daily supplementation of antioxidants, zinc, and carotenoids with (Group 1, n=10) or without (Group 2, n=10) omega-3 fatty acids (docosahexaenoic acid and eicosapentaenoic acid). They were compared to an anti-VEGF treatment naïve wet-AMD (Group 3, n=10) and an ERM/MH (Group 4, n=10) groups. Primary outcome was vitreal VEGF-A levels (at the time of anti-VEGF injection). Secondary outcomes were plasma VEGF-A and central foveal thickness (CFT). Patients with new submacular hemorrhage or any other treatment within 3 months were excluded. Final analyses included 9, 6, 7, and 8 patients in groups 1 to 4, respectively.

RESULTS: Patients receiving omega-3s (Group 1) had significantly lower levels of vitreal VEGF-A (141.11 ± 61.89 pg/mL) when compared to Group 2 (626.09 ± 279.27 pg/mL, p= 0.036) and Group 3 (735.48 ± 216.43 pg/mL, p= 0.013), but similar levels to Group 4 (235.81 ± 33.99 pg/mL, p= 0.215). All groups showed similar values for plasma VEGF-A and CFT measurements.

CONCLUSIONS: This study demonstrated that omega-3 supplementation combined with anti-VEGF treatment is associated with decreased vitreal VEGF-A levels in wet-AMD patients.

PMID: 25089351 [PubMed - as supplied by publisher]

Biomed Res Int. 2014;2014:413150. doi: 10.1155/2014/413150. Epub 2014 Jul 3.

Nutritional risk factors for age-related macular degeneration.

Ersoy L, Ristau T, Lechanteur YT, Hahn M, Hoyng CB, Kirchhof B, den Hollander AI, Fauser S.

Purpose: To evaluate the role of nutritional factors, serum lipids, and lipoproteins in late age-related macular degeneration (late AMD).

Methods: Intake of red meat, fruit, fish, vegetables, and alcohol, smoking status, and body mass index (BMI) were ascertained questionnaire-based in 1147 late AMD cases and 1773 controls from the European Genetic Database. Serum levels of lipids and lipoproteins were determined. The relationship between nutritional factors and late AMD was assessed using logistic regression. Based on multivariate analysis, area-under-the-curve (AUC) was calculated by receiver-operating-characteristics (ROC).

Results: In a multivariate analysis, besides age and smoking, obesity (odds ratio (OR): 1.44, P = 0.014) and red meat intake (daily: OR: 2.34, P = 8.22 × 10(-6); 2-6x/week: OR: 1.67, P = 7.98 × 10(-5)) were identified as risk factors for developing late AMD. Fruit intake showed a protective effect (daily: OR: 0.52, P = 0.005; 2-6x/week: OR: 0.58, P = 0.035). Serum lipid and lipoprotein levels showed no significant association with

late AMD. ROC for nutritional factors, smoking, age, and BMI revealed an AUC of 0.781.

Conclusion: Red meat intake and obesity were independently associated with increased risk for late AMD, whereas fruit intake was protective. A better understanding of nutritional risk factors is necessary for the prevention of AMD.

PMID: 25101280 [PubMed - in process] PMCID: PMC4101976

Workplace Health Saf. 2014 Aug;62(8):352. doi: 10.3928/21650799-20140708-06.

Age-related macular degeneration.

Randolph SA.

Abstract: Age-related macular degeneration (AMD) is a common and painless eye condition that is the leading cause of vision loss for people older than 50 years. Occupational and environmental health nurses can aid in slowing the progression of AMD by encouraging workers to have periodic eye examinations, maintain good health practices, and notify health care professionals if they notice blurred vision or blind spots in central vision. [Workplace Health Saf 2014;62(8):352.].

PMID: 25093372 [PubMed - in process]

J Nutr Biochem. 2014 Jul 4. pii: S0955-2863(14)00132-6. doi: 10.1016/j.jnutbio.2014.05.015. [Epub ahead of print]

Resveratrol prevents the development of choroidal neovascularization by modulating AMP-activated protein kinase in macrophages and other cell types.

Nagai N, Kubota S, Tsubota K, Ozawa Y.

Abstract: The development of choroidal neovascularization (CNV) is a critical step in the pathogenesis of age-related macular degeneration (AMD), a vision-threatening disease. In this study, we used a mouse model of AMD to study the protective effects of resveratrol (RSV) supplementation against CNV as well as the underlying molecular mechanisms. Mice were orally pretreated with RSV daily for 5days. On the fifth day, the mice underwent laser photocoagulation to induce CNV. One week after laser treatment, CNV volume was significantly lower in the RSV-treated mice compared with vehicle-treated animals. In addition, RSV treatment significantly inhibited macrophage infiltration into the retinal pigment epithelium (RPE)-choroid and suppressed the expression of inflammatory and angiogenic molecules, including vascular endothelial growth factor, monocyte chemotactic protein-1 and intercellular adhesion molecule-1. Importantly, RSV prevented the CNV-induced decrease in activated AMP-activated protein kinase and increase in activated nuclear factor-κB in the RPE-choroid complex. The regulatory effects of RSV on these molecules were confirmed in RPE, microvascular endothelial and macrophage cell lines. Inhibition of macrophage infiltration by RSV was confirmed by in vitro scratch and migration assays. RSV suppressed CNV development, reducing the levels of multiple cytokines secreted from several cell types and inhibiting macrophage migration. The direct effects of RSV on each cell type were confirmed in vitro. Although further studies are needed, RSV could potentially be applied in the clinic to prevent CNV development in AMD.

PMID: 25091551 [PubMed - as supplied by publisher]