خبرنامه انجمن فوق تخصصی ویتره و رتین

خرداد ماه ۱۳۹۴ – سال سوم – شماره نهم

AAO Express

New drug shows promise in dry AMD

This randomized, placebo-controlled phase 2 study evaluated the safety and pharmacodynamics of emixustat hydrochloride in 72 patients with geographic atrophy associated with dry AMD. Emixustat is the first compound in a new therapeutic drug class called a visual cycle modulator. Taken orally, the nonretinoid compound is designed to reduce the accumulation of vitamin A-based toxins by slowing visual cycle activity. At 90 days, emixustat suppressed rod photoreceptor sensitivity in a dose-dependent manner. The authors showed emixustat produced a dose-dependent reversible effect on rod function that is consistent with the proposed mechanism of action. Retina, June 2015

Topical nepafenac ineffective for noncentral DME

Data from this DRCR.net study suggests that the beneficial effect of nepafanec on macular edema in patients with diabetes may be limited to macular edema associated with recent cataract surgery rather than diabetic macular edema. The authors randomized 125 patients with good visual acuity and noncentral-involved diabetic macular edema to take nepafenac 0.1% or placebo 3 times daily for 12 months. At 1 year, the treated patients showed no significant difference in the mean change in retinal volume as measured by OCT. Retina, May 2015

NEW JOURNAL STUDIES FROM THE MIDDLE EAST AND AFRICA (MEAJO)

Diabetic retinopathy ideally suited for telemedicine

Ophthalmology is a field uniquely suited for telemedicine since it relies on images. And due to the rising incidence of diabetes, diabetic retinopathy is an ideal ophthalmic disease for telescreening and decision-making. It fits to Wilson and Jungner's all 10 criteria of screening for chronic diseases and the American Telehealth Association's 4 screening categories. The authors write that better and faster telecommunication technology offer an opportunity to expand telescreening services to more remote areas. They conclude that automatic detection of retinal lesion images will likely play a major role in screening and management of diabetic retinopathy in the future. Middle East Africa Journal of Ophthalmology (MEAJO), April/June 2015

Update on diabetic retinopathy

The relationship of blood glucose to retinopathy is strong. Patients with chronically elevated blood glucose levels have substantially more, and more severe, retinopathy than those with lower blood glucose levels. Evidence for the role of blood pressure is weak. Multiple controlled clinical trials of antihypertensive agents in diabetic subjects have produced only weak evidence of benefit from blood pressure lowering on the incidence and progression of diabetic retinopathy. Elevated blood lipids seem to play a role in the progression of retinopathy. Two trials of the lipid-lowering agent fenofibrate show a benefit in preventing retinopathy progression; however, the mechanism of action may not be directly related to blood lipid reduction. Lastly, there is strong circumstantial evidence for a genetic or epigenetic influence on the pathogenesis of diabetic retinopathy, but the gene or genes that predispose or protect against the development and progression of diabetic retinopathy remain elusive. Middle East Africa Journal of Ophthalmology (MEAJO), April/June 2015

ACADEMY NEWS

New login for aao.org

The Academy now requires a primary email address to log into aao.org. We encourage you to change your login now, which you can do easily by logging in with your current username and password. You do not need to make any changes to your password. If you have not changed your username by Monday, June 15, the Academy will make the change on your behalf. If we do not have a primary email for you or if you have questions contact member_services@aao.org.

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Short-term Outcomes of Switching Anti-VEGF Agents in Eyes With Treatment-resistant Wet AMD

Figen Batioglu; Sibel Demirel; Emin Özmert; Ahmet Abdullayev; Serdar Bilici

BMC Ophthalmol. 2015;15(40)

این مطالعه تأثیر aflibercept داخل ویتره در بیماران wet AMD که به درمان با ranibizumab پاسخ نداده اند را بررسی کرده است. این مطالعه در ۲۹ چشم انجام شده است. تزریق aflibercept در این بیماران منجر به کاهش ضخامت مرکز ماکولا از 471µ به ۳۴۵ µشده است. همچنین منجر به کاهش ارتفاع PED از ۳۵۰ µ به ۲۵۵ µشده است.

Background To investigate the short-term outcomes of treatment with intravitreal aflibercept in cases with wet age-related macular degeneration (AMD) resistant to ranibizumab.

Methods The study included patients who had been undergoing follow-up for a minimum of three months at the Ankara University Faculty of Medicine Ophthalmology Department's Retina Unit with a diagnosis of wet AMD. All cases had received intravitreal aflibercept injection due to the presence of intraretinal/subretinal fluid and pigment epithelial detachment (PED), as detected by optical coherence tomography (OCT), despite having received intravitreal ranibizumab. Medical records of the cases were investigated retrospectively and the demographic data, treatments administered before aflibercept injection, best-corrected visual acuity (BCVA) before and after aflibercept injection, central macular thickness (CMT), and the presence of intraretinal/subretinal fluid and the height and presence of PED were recorded.

Results: A total of 29 eyes from 11 females and 17 males were included in the study. The mean age was 73.89 ± 7.49 (62–92). The average number of intraocular injections administered before aflibercept injection was 11.75 ± 5.73 (6–25). The mean duration of follow-up following aflibercept injection was 4.55 ± 2.14 (3–11) months, with a mean of 3.44 ± 0.73 (3–5) aflibercept injections during this period. The mean BCVA values before and after aflibercept injection were found to be 0.83 and 0.77 LogMAR, respectively. The mean CMT values before and after aflibercept injection were 471.3 (97–1365) and 345.1 (97–585) microns, respectively ($p < 0.001$). The PED height before and after aflibercept injection was 350.4 ± 151.7 (129–793) and 255.52 ± 156.8 (0–528) microns, respectively ($p < 0.05$).

Conclusion Switching to intravitreal aflibercept appears to be an effective treatment modality for patients with AMD who are resistant to ranibizumab. While anatomic success including the effect of reducing the PED height was achieved in the short term following aflibercept injection in all cases, no concomitant increase in visual acuity occurred.

Current Opinion in Ophthalmology

Advances in Drug Delivery to the Posterior Segment

William Pearce; Jason Hsu; Steven Yeh

Curr Opin Ophthalmol. 2015;26(3):233-239.

امروزه تحقیقات زیادی جهت تجویز داروها به قسمت خلفی چشم شده است. اگر چه تزریق داخل ویتره یکی از درمان های اصلی برای بیماری های ویتره و رتین است، ایمپلنت ها موجب تزریق کمتر و ریسک کمترناشی ازتزریق می شوند.

Purpose of review Emerging developments and research for drug delivery to the posterior segment offer a promising future for the treatment of vitreoretinal disease. As new technologies enter the market, clinicians should be aware of new indications and ongoing clinical trials.

Recent findings This review summarizes the advantages and shortcomings of the most commonly used drug delivery methods, including vitreous dynamics, physician sustainability and patient preferences. Currently available, intravitreal, corticosteroid-release devices offer surgical and in-office management of retinal vascular disease and posterior uveitis. The suprachoroidal space offers a new anatomic location for the delivery of lower dose medications directly to the target tissue. Implantable drug reservoirs would potentially allow for less frequent intravitreal injections reducing treatment burdens and associated risks. Newer innovations in encapsulated cell technology offer promising results in early clinical trials.

Summary Although pars plana intravitreal injection remains the mainstay of therapy for many vitreoretinal diseases, targeted delivery and implantable eluting devices are rapidly demonstrating safety and efficacy. These therapeutic modalities offer promising options for the vitreoretinal therapeutic landscape.

The British Journal of Ophthalmology

Comparison of Ketorolac 0.4% and Nepafenac 0.1% for the Prevention of Cystoid Macular Oedema After Phacoemulsification

Prospective Placebo-controlled Randomised Study

Patrick Frensel Tzelikis; Monike Vieira; Wilson Takashi Hida; Antonio Francisco Motta; Celso Takashi Nakano; Eliane Mayumi Nakano; Milton Ruiz Alves

Br J Ophthalmol. 2015;99(5):654-658.

در این مطالعه مقایسه اثرات کتورولاک و نپوفناک که به صورت پروفیلاکتیک در بیمارانی که تحت عمل جراحی فیکو قرار می گیرند از لحاظ کاهش موارد CME بررسی شده است. این مطالعه در ۱۲۶ بیمار در ۳ گروه انجام شده است و از لحاظ آماری ارتباط معنی داری بین این داروها در جلوگیری از CME مشاهده نشد.

Purpose To compare the anti-inflammatory efficacy of ketorolac of tromethamine 0.4% and nepafenac 0.1% eye drops for prophylaxis of cystoid macular oedema (CME) after small-incision cataract extraction.

Methods Patients were assigned randomly to three groups. Group 1 patients received a topical artificial tear substitute (placebo); group 2 received ketorolac tromethamine 0.4% (Acular LS, Allergan) and group 3 received nepafenac 0.1% (Nevanac, Alcon). The incidence and severity of CME were evaluated by retinal foveal thickness on optical coherence tomography (OCT) after 1, 4 and 12 weeks.

Results One hundred and twenty-six eyes of 126 patients were included in this study. The between-group differences in visual outcomes, central corneal thickness and endothelial cell density were not statistically significant. In all retinal thickness measurements, an increase was detected starting from the postoperative first week until 12 weeks. There was no statistically significant difference between the three groups in any measurement performed by spectral-domain OCT.

Conclusions Used prophylactically after uneventful cataract surgery, non-steroidal anti-inflammatory drugs were not efficacious in preventing macular oedema compared with placebo.

BMC Endocrine Disorders

C-reactive Protein Genetic Variant Is Associated With Diabetic Retinopathy in Chinese Patients With Type 2 Diabetes

Danfeng Peng; Jie Wang; Rong Zhang; Shanshan Tang; Feng Jiang; Miao Chen; Jing Yan; Xue Sun; Tao Wang; Shiyun Wang; Yuqian Bao; Cheng Hu; Weiping Jia

BMC Endocr Disord. 2015;15(8)

این مطالعه در بیماران مبتلا به تیپ II دیابت که دچار رتینوپاتی دیابتی شده اند، واریانت های ژنتیکی در CRPبررسی شده است که در این بیماران (در کشور چین rs2808629 (بیشتر بوده است.

Background Diabetic retinopathy (DR) is an important microvascular complication of diabetes with a high concordance rate in patients with diabetes. Inflammation is supposed to participate in the development of DR. This study aimed to investigate whether genetic variants of CRP are associated with DR.

Methods A total of 1,018 patients with type 2 diabetes were recruited in this study. Of these patients, 618 were diagnosed with DR, 400 were patients with diabetes for over 10 years but without DR, considered as cases and controls for DR, respectively. Four tagging SNPs (rs2808629, rs3093077, rs1130864 and rs2808634) within CRP region were genotyped for all the participants. Fundus photography was performed for diagnosis and classification for DR.

Results rs2808629 was significantly associated with increased susceptibility to DR (odds ratio 1.296, 95% CI 1.076–1.561, $P = 0.006$, empirical $P = 0.029$, for G allele). This association remained significant after adjustment for confounding factors (odds ratio 1.261, 95% CI 1.022–1.555, $P = 0.030$).

Conclusions In this study, we found CRP rs2808629 was associated with DR in the Chinese patients with type 2 diabetes.

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Current Opinion in Ophthalmology

What Have We Learnt About the Management of Diabetic Macular Edema in the Antivascular Endothelial Growth Factor and Corticosteroid Era?

Aniruddha Agarwal; Salman Sarwar; Yasir J. Sepah; Quan D. Nguyen Disclosures

Curr Opin Ophthalmol. 2015;26(3):177-183.

اگر چه داروهای Anti VEGF و کورتیکو استروئیدها در خط اول درمان DME می باشند امروز نگرانی هایی از پاسخ کمتر از مطلوب آنها، VEGFهای مقاوم و اثرات آنها بر عروق و لایه های رتین وجود دارد.

Purpose of review To summarize the outcomes of the use of antivascular endothelial growth factor (anti-VEGF) agents and corticosteroids on the treatment paradigm for diabetic macular edema (DME).

Recent findings Favorable efficacy data along with acceptable long-term safety results of anti-VEGF agents have made them the standard first-line therapy in the management of DME. Level I evidence from large, multicenter clinical trials has established the beneficial role of anti-VEGF agents and intravitreal steroids. In addition, the role of anti-VEGF agents in the treatment of diabetic retinopathy has also been recently recognized. However, concerns such as suboptimal response, VEGF resistance, and long-term effects on retinal layers and vasculature have also been highlighted recently.

Summary The use of anti-VEGF agents and corticosteroids has revolutionized the management of DME. Despite the advantages including ease of administration, low incidence of adverse events, and concomitant improvement in retinopathy status, limitations of this therapeutic approach have been recognized. The current review will focus on the lessons learnt in the management of DME in the anti-VEGF and steroid era.

Cardiovascular Diabetology

Type 2 Diabetes-Associated Carotid Plaque Burden Is Increased in Patients With Retinopathy Compared to Those Without Retinopathy

Núria Alonso; Alicia Traveset; Esther Rubinat; Emilio Ortega; Nuria Alcubierre; Jordi Sanahuja; Marta Hernández; Angels Betriu; Carmen Jurjo; Elvira Fernández; Didac Mauricio

Cardiovasc Diabetol. 2015;14(33)

در بیماران دیابتی نوعII ، علاوه بر بیماری های کاردیوواسکولار، شیوع پلاک کاروتید نیز بالاتر می باشد.

Background Cardiovascular disease (CVD) is the leading cause of mortality among subjects with type 2 diabetes (T2D), and diabetic retinopathy (DR) has been associated with an increased risk for CVD. The present study was designed to test the concept that T2D patients with DR, but without previous cardiovascular (CV) events and with normal renal function, have an increased atherosclerotic burden compared with patients without DR.

Methods A cross-sectional study was performed using patients with normal renal function (estimated glomerular filtration rate (eGFR) >60 ml/min) and without previous CV events. A total of 312 patients (men, 51%; mean age, 57 yrs; age range 40–75 yrs) were included in the study; 153 (49%) of the patients had DR. B-mode carotid ultrasound imaging was performed for all of the study subjects to measure the carotid intima-media thickness (cIMT) and carotid plaques in the common carotid artery (CCA), bifurcation and internal carotid artery (ICA).

Results The percentage of carotid plaques in T2D patients with DR was higher than in T2D patients without DR (68% vs. 52.2%, $p = 0.0045$), and patients with DR had a higher prevalence of ≥2 carotid plaques (44.4% vs. 21.4%; $p < 0.0001$). No differences were observed in the cIMT measured at different carotid regions between the patients with or without DR. Using multivariate logistic regression (adjustment for major risk factors for atherosclerosis), DR was independently associated with mean-internal cIMT ($p = 0.0176$), with the presence of carotid plaques ($p = 0.0366$) and with carotid plaque burden (≥2 plaques; $p < 0.0001$).

Conclusions The present study shows that DR in T2D patients without CVD and with normal renal function is associated with a higher atherosclerotic burden (presence and number of plaques) in the carotid arteries. These patients may be at a higher risk for future CV events; therefore, an ultrasound examination of the carotid arteries should be considered in patients with DR for more careful and individualised CV assessment and follow-up.

Residual Edema Evaluation With Ranibizumab 0.5 mg and 2.0 mg Formulations for Diabetic Macular Edema

REEF Study

DS Dhoot; DJ Pieramici; M Nasir; AA Castellarin; S Couvillion; RF See; N Steinle; M Bennett; M Rabena; RL Avery

Eye. 2015;29(4):534-541.

در مطالعه ای که روی ۴۳ بیماربا ادم ماکولای دیابتی مقاوم به bevacizumab طی ۱۲ ماه انجام گرفت.تزریق Ranibizumab 0.5 mg و ۲,۰ mg باعث بهبود در دید و ضخامت شبکیه گردید.بطوریکه افزایش دوز باعث افزایش نتایج بهبودی گردید.هر چند دوز ۲میلیگرم دارو بصورت تجاری در بازار موجود نیست.

Abstract

Purpose To compare the efficacy of ranibizumab 0.5-mg and 2.0-mg intravitreal injections for persistent diabetic macular edema (DME) previously treated with bevacizumab.

Methods In all, 43 patients with residual center-involved DME following intravitreal bevacizumab were included in this 12-month prospective, nonrandomized, multicenter study. Enrolled patients received three monthly ranibizumab 0.5-mg injections. At month 3, patients with residual macular edema switched to three monthly injections of ranibizumab 2.0-mg. Assessments included monthly visual acuity and spectral-domain optical coherence tomography.

Results Mean visual acuity improved by +6.4 letters at month 3 and +8.8 letters at month 6. Mean central subfield thickness (CST) decreased by –113 μm at month 3 and –165 μm at month 6. Before enrollment, 29/43 (67.4%) patients showed <10% CST reduction following monthly bevacizumab treatment. After three monthly ranibizumab 0.5-mg injections, 22/29 (75.9%) patients showed >10% reduction in CST, whereas 6 showed <10% reduction. Of these six, three (50%) showed >10% reduction in CST after switching to three monthly ranibizumab 2.0-mg doses. No serious adverse events were observed to month 6.

Conclusion Ranibizumab 0.5-mg or 2.0-mg may improve visual and anatomic outcomes in patients with DME who demonstrated minimal or no response to bevacizumab therapy. Moreover, increased dosage of ranibizumab (2.0-mg) may provide additional benefit over ranibizumab 0.5-mg in some patients. However, 2.0-mg ranibizumab is not currently commercially licensed or available.

BMC Ophthalmology

Ranibizumab for Macular Edema Secondary to Retinal Vein Occlusion

A Meta-analysis of Dose Effects and Comparison With No Anti-VEGF Treatment

Wei-tao Song; Xiao-bo Xia

BMC Ophthalmol. 2015;15(31)

تزریق داخل ویتره۰٫۵ mg و ۰٫۳ mg Ranibizumab اثر بخشی بالاتری به نسبت درمانهای لیزری در ادم ماکولای ناشی از انسداد وریدی رتین دارد.دوز ۰٫۳ و ۰٫۵ اثر بخشی یکسانی دارند

Abstract

Background To compare the efficacy and tolerability of intravitreal ranibizumab (IVR) 0.5 mg or 0.3 mg with non-anti-vascular endothelial growth factor (VEGF), and to compare the efficacy of IVR 0.5 mg with IVR 0.3 mg in the treatment of macular edema secondary to retinal vein occlusion.

Methods Relevant studies were selected after an extensive search using the PubMed, EMBASE, Web of Science, and Cochrane Library databases. Outcomes of interest included visual outcomes, anatomic variables, and adverse events.

Results Four randomized controlled trials (RCTs) met our inclusion criteria. IVR 0.5 mg produced a significantly higher improvement in visual acuity at six months, with pooled weighted mean differences (WMDs) of 12.30 early treatment diabetic retinopathy study (ETDRS) letters (95% CI:10.03, 14.58) ($P < 0.001$), and led to a higher proportion of patients gaining ≥15 letters (RR, 2.36; 95%CI: 1.86, 2.99; $P < 0.001$) at the follow-up endpoint, compared with non-anti-VEGF. A more obvious reduction in central foveal thickness (CFT) was observed in the IVR 0.5 mg group than the non-anti-VEGF group, and the mean difference in CFT was statistically significant (WMD, −216.86 μm; 95%CI: −279.01, −154.71; $P < 0.001$). A similar efficacy was found between the IVR 0.3 mg group and the non-anti-VEGF group. No significant differences were found between IVR 0.5 mg and 0.3 mg. The incidence of iris neovascularization in the non-anti-VEGF group was significantly higher than that of the IVR group.

Conclusions IVR 0.5 mg or 0.3 mg was more effective than sham injection and laser treatment. IVR 0.3 mg is as effective as IVR 0.5 mg in the treatment of macular edema secondary to retinal vein occlusion.

The British Journal of Ophthalmology

Severity of Coronary Artery Disease Is Independently Associated With the Frequency of Early Age-Related Macular Degeneration

Sarah B Wang; Paul Mitchell; Joseph Chiha; Gerald Liew; Adam J H Plant; Aravinda Thiagalingam; George Burlutsky; Bamini Gopinath Disclosures

Br J Ophthalmol. 2015;99(3):365-370.

شدت انسداد عروق کرونری و وجود ضایعات استنوز با مراحل اولیه AMD همراهی دارد و چنین بیمارانی میبایست از نظر AMD تحت اسکرین قرار گیرند.

Abstract

Background/aims To describe the prevalence of early, late and any age-related macular degeneration (AMD) in a clinical cohort (Australian Heart Eye Study, AHES) and to determine whether associations exist between extent and severity of coronary artery disease (CAD) and AMD, independent of traditional cardiovascular risk factors.

Methods The AHES is an observational study that surveyed 1680 participants between 2009 and 2012 who presented to a tertiary referral hospital for the evaluation of potential CAD by coronary angiography. Severity and extent of CAD was assessed using three scoring systems: (1) segment/vessel scores, (2) Gensini and (3) extent scores.

Results Prevalence of early and late AMD was 5.8% (n=86) and 1.4% (n=21), respectively. After multivariable adjustment, patients with stenosis >50% in any coronary artery segment (vessel score) had approximately twofold higher odds of early AMD, OR 1.95 (95% CI 1.07 to 3.57). Patients with obstructive coronary stenosis in all three main coronary arteries (segment score) had greater than twofold higher likelihood of early AMD, OR 2.67 (95% CI 1.24 to 5.78). Participants in the highest versus lowest tertile of Gensini scores were also twice as likely to have early AMD, multivariable-adjusted OR 2.27 (95% CI 1.12 to 4.58). Extent scores were not associated with AMD. There was no significant association between CAD and late AMD.

Conclusions Severity of coronary stenosis and the presence of stenotic lesions were independently associated with early AMD. These findings could have potential clinical significance as they suggest that individuals with evidence of CAD may be screened for early AMD.

Current Opinion in Ophthalmology

Diabetic Macular Edema: Changing Treatment Paradigms

J. Fernando Arevalo Disclosures

Curr Opin Ophthalmol. 2014;25(6):502-507.

درمانهای ضد VEGF اثر بخشی بالاتری به نسبت درمانهای لیزری در ادم ماکولای دیابتی دارند.هرچند با وجود انواع این داروها در بازار انتخاب نوع دارو مساله ای چالش برانگیز میباشد.

Abstract

Purpose of review To review the current management and recent changes in treatment paradigm for diabetic macular edema (DME).

Recent findings During the review period (1 year), several prospective studies analyzed the beneficial effect of anti-vascular endothelial growth factor agents in the management of DME. An exploratory analysis concluded that intravitreal ranibizumab appears to be associated with a reduced risk of diabetic retinopathy worsening. A randomized, controlled, multicenter, double-masked, parallel-group, 12-month trial to evaluate a dexamethasone intravitreal implant (DEX implant) combined with laser photocoagulation compared with laser alone for treatment of DME concluded that there was no significant between-group difference at month 12. A multicenter, prospective, observational study found that in eyes with diabetic retinopathy without concurrent central-involved DME, presence of noncentral-involved DME immediately prior to cataract surgery or history of DME treatment may increase the risk of developing central-involved macular edema after cataract extraction. Another randomized trial to evaluate whether intravitreal ranibizumab injection at cataract surgery prevents postoperative DME concluded that intravitreal ranibizumab injection at cataract surgery may prevent the postoperative worsening of macular edema.

Summary The results of clinical trials have shown the superiority of some of these anti-vascular endothelial growth factor agents to laser therapy. However, with the availability of several of

these newer agents, it may be difficult to individualize treatment options, especially if DME patients respond differently to various therapies.

Medscape Medical News

OCT Angiography May Better Diagnose, Manage Retinal Disease

Marlene Busko

April 30, 201

Proc Natl Acad Sci. Published online April 20, 2015.

تکنیک OCTانژیوگرافی در آسیا واروپا جهت مصارف بالینی تایید شده است و علیرغم اینکه فعلا در آمریکا توسط سازمان غذا و دارو تایید نشده در بسیاری از مراکز در کار های تحقیقاتی استفاده می شود انتظار می رود این تکنیک تصویر برداری در ۱۰ سال اینده تحول شگرفی در رابطه با تشخیص بیماری های مختلف چشم فراهم آورد.

A new study shows how optical coherence tomography (OCT) angiography can be used to visualize common retinal diseases such as diabetic retinopathy, age-related macular degeneration, and choroideremia, which are major causes of blindness.

Researchers led by Yali Jia, PhD, from the Casey Eye Institute, Oregon Health & Science University, Portland, present six commonly seen case scenarios in an article published online April 20 in the Proceedings of the National Academy of Sciences.

OCT angiography is approved for clinical use in Europe and Asia but has not yet been approved by the US Food and Drug Administration. However, ophthalmologists in several US centers have been using this technology in research studies for about 5 years, senior author David Huang, MD, PhD, also from the Casey Eye Institute, told Medscape Medical News.

This technology enables ophthalmologists to better visualize blood flow in the retina and choroid capillary network and to detect the growth of abnormal blood vessels (neovascularization). "Once it's approved by the FDA, I think it's going to be used more than fluorescein angiography, because it's less invasive, and fast," Dr Huang said. Ophthalmologists would only need a new-generation OCT instrument plus a new software algorithm, he added.

"Drs Huang and Jia are pioneers in the field who have invented a software algorithm that elegantly allows some OCT hardware to perform OCT angiography," Amir H. Kashani, MD, PhD, from Keck Medicine of the University of Southern California-Pasadena and the University of Southern California Eye Institute, Los Angeles, told Medscape Medical News.

Researchers at the University of Southern California have developed a similar way to perform OCT angiography, which appears to be as effective, he noted. "It is not yet clear which method will be the best or most clinically meaningful, but it is fair to say that OCT angiography is a significant breakthrough technology that can change the practice of ophthalmology in the next 10 years, similar to how OCT revolutionized ophthalmology in the past decade," Dr Kashani said.

Noninvasive 3D Imaging of Eye Vasculature

OCT is very useful for evaluating fluid accumulation and guiding treatment in retinal diseases, and it has become "the most commonly used imaging modality in ophthalmology," Dr Jia and colleagues write. However, to detect capillary dropout or neovascularization in diabetic retinopathy or age-related macular degeneration, ophthalmologists still use fluorescein dye to visualize the retinal vasculature and then use indocyanine green dye to evaluate the choroidal vasculature. The dyes require intravenous administration, which is time consuming and may cause adverse effects such as nausea and vomiting. Moreover, the two-dimensional images from this type of angiography may be blurred at the edges because of dye leakage.

Dr Jia and colleagues used a custom-built OCT angiography system or a commercially available OCT angiography system (RTVue-XR, Optovue), along with a proprietary split-spectrum amplitude-decorrelation angiography algorithm to show how this technology could be used for noninvasive vascular imaging of blood flow in the eye in a clinical setting.

They report three major findings. First, OCT angiography with split-spectrum amplitude-decorrelation angiography captured a large, 6 × 6 mm view of the macula with adequate resolution, using a commercially available OCT system, Dr Jia and colleagues write.

Second, the colored display shows multiple vasculatures in the same image panel, so abnormalities can be located more precisely with minimal interference from artifacts.

Third, to the best of their knowledge, this is the first time that retinal neovascularization as well as the capillary dropout area in the retinal circulation and choriocapillaris were quantified in vivo.

"It is exciting that we can finally visualize the capillary level detail of the retina in real time," Dr Kashani said. Although ophthalmologists have known for decades that the earliest pathological signs of retinal vascular diseases such as diabetic retinopathy occur in the capillaries, until now the disease was only detected at more advanced stages, he noted.

However, "with OCT angiography, we now have a way to noninvasively, safely, and effectively visualize the earliest pathological changes in some of the most prevalent [diseases that cause blindness, which] will very likely lead to earlier diagnosis and more effective treatments."

Abstract

Medscape Medical News

Telemedicine via PCPs Ups Diabetic Retinopathy Screenings

Marcia Frellick

March 10, 2015

JAMA Ophthalmol. Published online March 5, 2015.

اخیرا استفاده از تکنیک Etelemedicineتوسط پزشک خانواده جهت غربالکری بیماران دیابتی از لحاظ رتینو پاتی دیابتی امیدواری زیادی را فراهم اورده است این روش در مقایسه با روش سنتی غربالگری بیماران دیابتی صرف هزینه و وقت کمی را برای بیمار تحمیل میکند و شامل گرفتن تصاویر شبکیه بدون گشاد کردن مردمک و ارسال ان برای بررسی تکمیلی و پیگیری در طول زمان می باشد.

Researchers have found long-term positive results when primary care physicians (PCPs) use telemedicine to screen for diabetic retinopathy.

Steven Mansberger, MD, MPH, from the Devers Eye Institute in Portland, Oregon, and colleagues found that telemedicine increased the percentage of diabetic retinopathy screening examinations. They also found that most participants did not require referral to an eye care professional after the screening and that diabetic retinopathy levels were relatively stable during the study period. Results were published online March 5 in JAMA Ophthalmology.

This finding suggests that PCPs can use telemedicine with nonmydriatic cameras to take retinal images without dilation, send images for remote evaluation, and watch for disease worsening over time.

This study builds on others that have shown you can improve the rate of diabetic eye exam with telemedicine, but this one adds long-term evaluation, Dr Mansberger told Medscape Medical News.

The results come in light of research that projects the percentage of US adults with diabetes will increase from 14% in 2010 to approximately 33% by 2050. Finding and treating diabetic retinopathy is key to avoiding vision loss. However, fewer than half of patients with diabetes get the annual screening.

Telemedicine increases the numbers by improving access in rural areas and providing convenience (15 minutes vs 2 hours) and lower cost than a full eye exam ($40 and no extra copay vs about $200) for patients in the primary care setting, according to the authors.

Testing patients in a primary care practice's office, however, has some hurdles, in that imaging is done in a separate room.

Physicians can look at feet, do a laboratory test, and get an electrocardiogram in the same room, but at this time, patients would then have to move to another room for the eye exam, Dr Mansberger said.

"In the future, we'll have devices that are much smaller and easier to use, and we can bring them right into the room," he said.

Comparing Telemedicine With Traditional Exam

Patients with diabetes were randomly assigned into two groups in a multicenter trial. Some received telemedicine in a primary care medical clinic (n = 296), and some received a traditional exam with an eye care professional (n = 271). Participants were followed for up to 5 years. Two years after enrollment, telemedicine was offered to all participants.

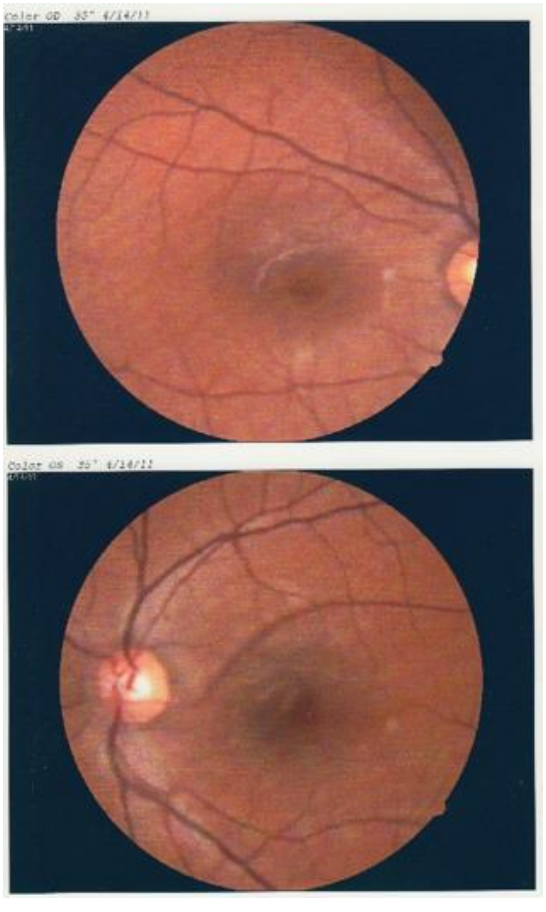
The results were as follows for the three major outcomes: With regard to likelihood of getting screening, the telemedicine group was more likely to receive the screening exams compared with the traditional group during the 6-month or less (94.6% [280/296] vs 43.9% [119/271]; 95% confidence interval [CI], 46.6% - 54.8%; P < .001) and greater than 6-month through 18-month (53.0% [157/296] vs 33.2% [90/271]; 95% CI,16.5% - 23.1%; P < .001) periods.

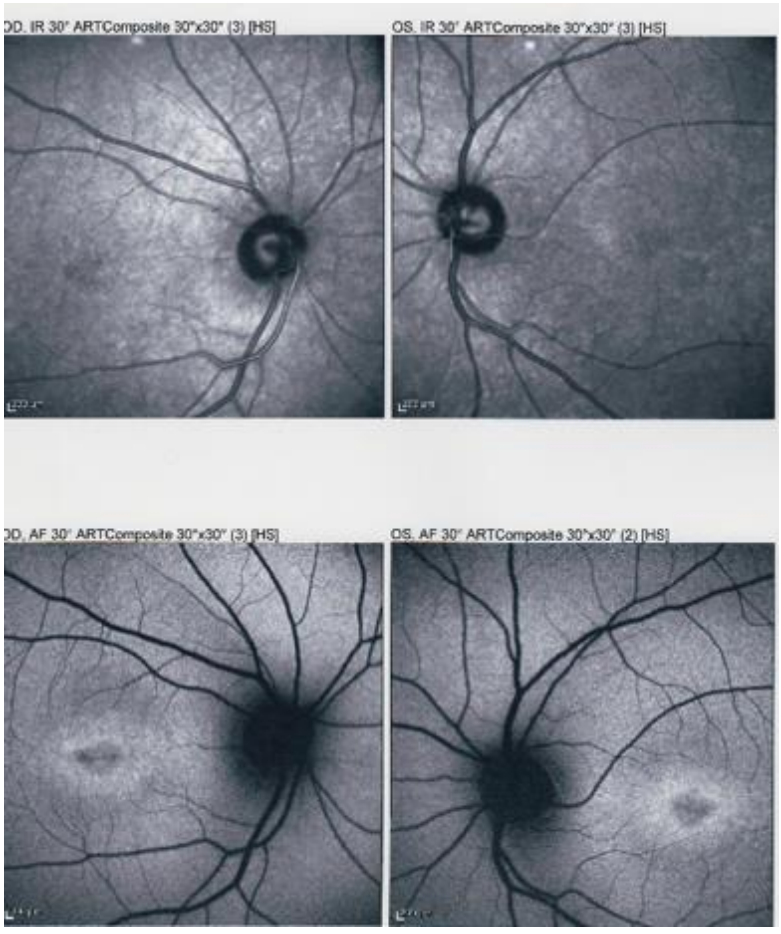
In addition, during the study, more than 90% (range, 90.4% - 94.1%) of eyes kept their diabetic retinopathy stage within ±1 of their baseline stage throughout the study. From 42 through 54 months, 35 (8.6%; 95% CI, 5.8% - 11.2%) of 409 participants had worsening by 2 stages or more, and 5 (1.2%; 95% CI, 0.1% - 2.3%) of 409 had an improvement by 2 stages or more.

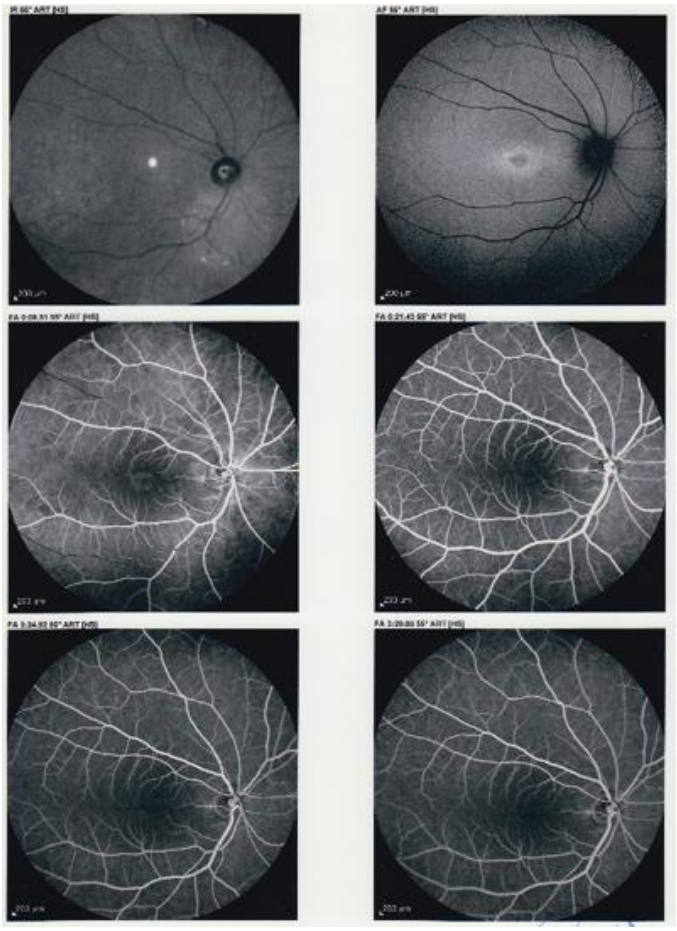
Finally, when it comes to referral rate, referrals ranged from 19.2% (52/271) to 27.9% (58/208). Dr Mansberger said better imaging will eventually lower the referral numbers, adding to the cost-effectiveness. Poor imaging quality can come from small pupil size or ocular media abnormalities such as cataract.

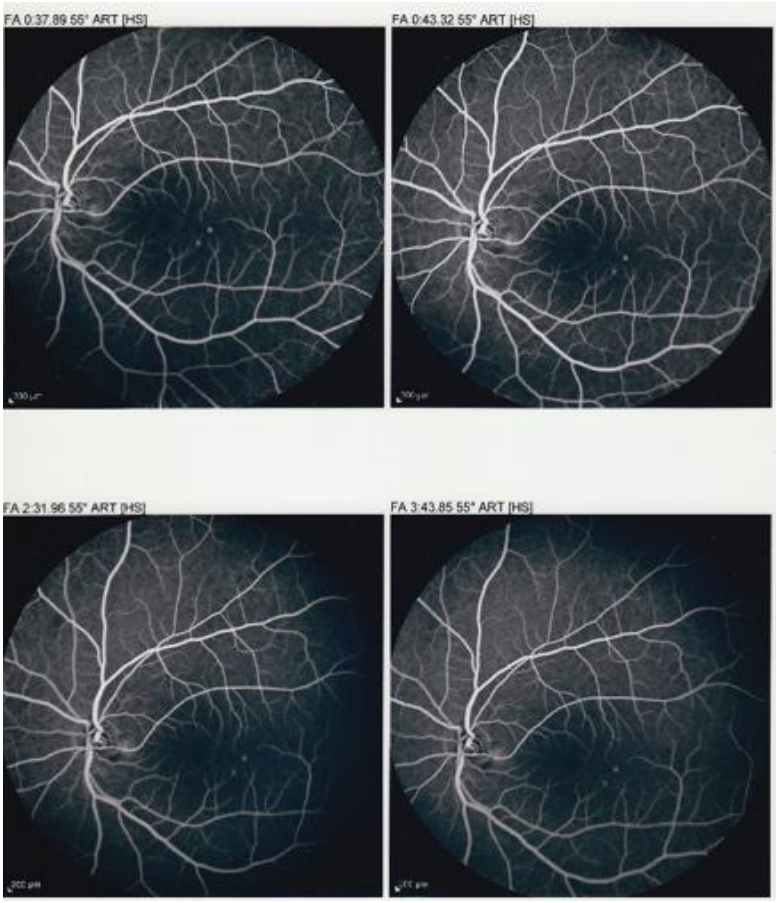
OCT Findings in Foveal Hypoplasia

- **27 YOM presented with blurring vision ou since childhood**
- **Fine pendular nystagmus**
- **FMH –**
- **VA ou 1/10**
- **Ant segment ok**
- **Fundus:?**





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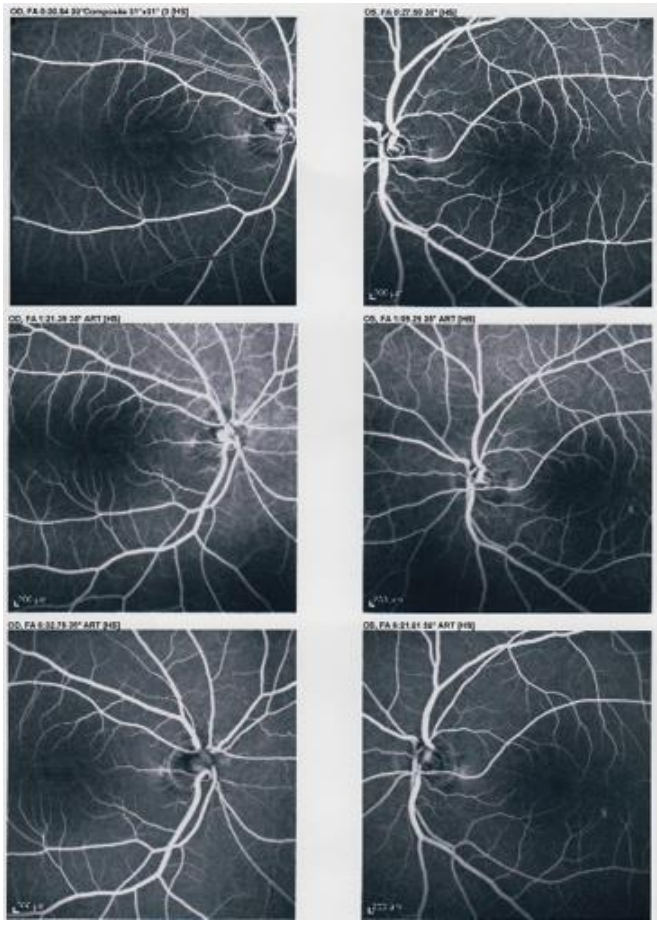
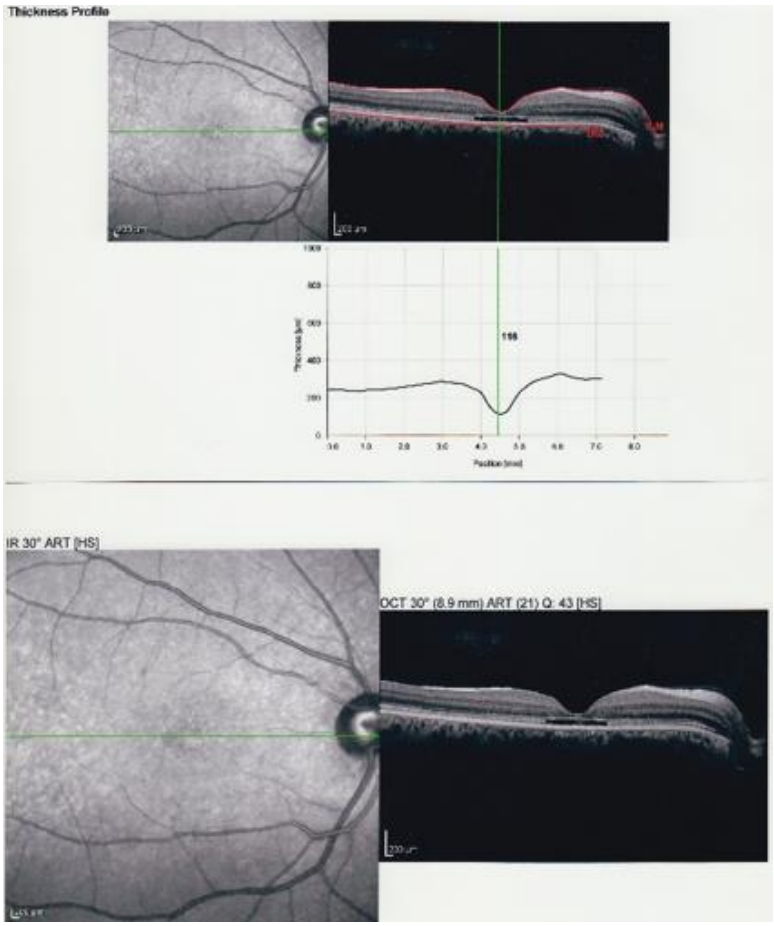
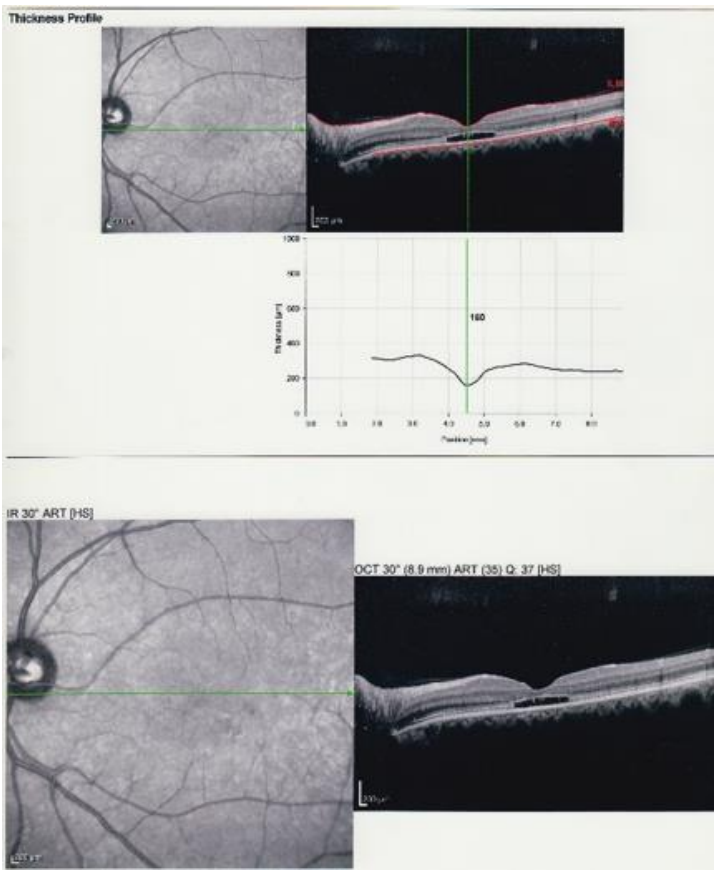
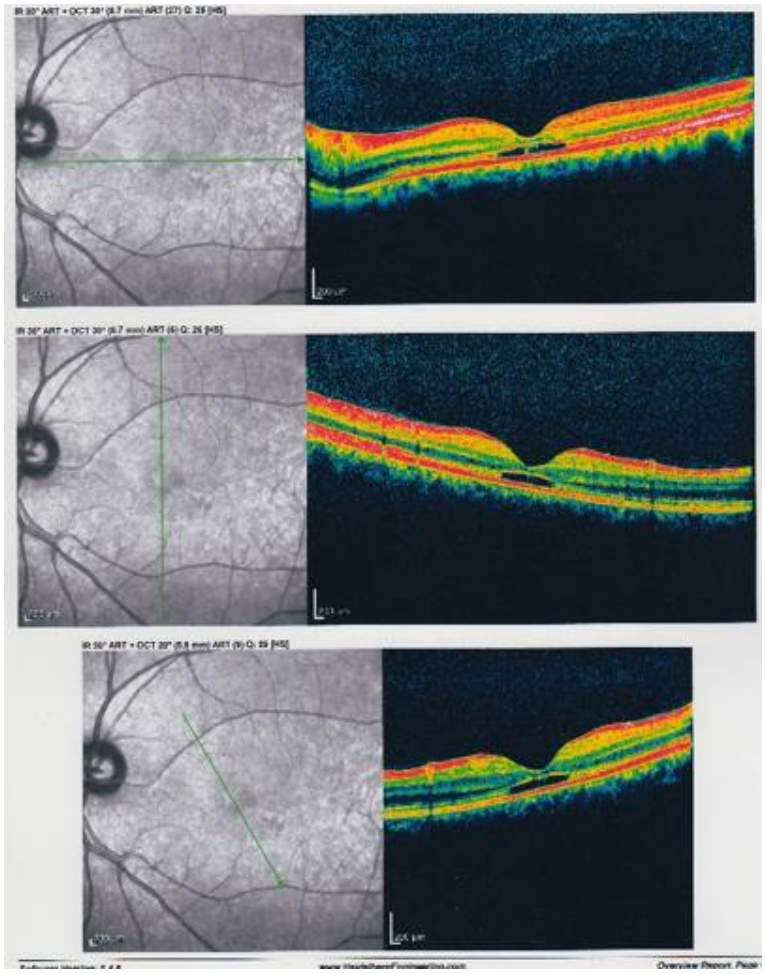
FA 0:43.32 55° ART [HS]
FA 2:31.96 55° ART [HS]
FA 3:43.85 55° ART [HS]




Thickness Profile
IR 30° ART [HS]
OCT 30° (8.9 mm) ART (21) Q: 43 [HS]





Structural Grading of Foveal Hypoplasia Using Spectral-Domain Optical Coherence Tomography

A Predictor of Visual Acuity?

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Purpose: To characterize and grade the spectrum of foveal hypoplasia based on different stages of arrested development of the fovea. Grading was performed using morphologic findings obtained by ultra high-resolution spectral-domain optical coherence tomography. Best-corrected visual acuity (BCVA) was calculated for different grades.

Design: Observational case series.

Participants and Controls: Sixty-nine patients with foveal hypoplasia (albinism, n = 34; *PAX6* mutations, n = 10; isolated cases, n = 14; achromatopsia, n = 11) and 65 control subjects were examined.

Methods: A 7×7-mm retinal area was sampled using a 3-dimensional scanning protocol (743×75, A scans×B scans) with ultra high-resolution spectral-domain optical coherence tomography (SOCT Copernicus HR; 3-μm axial resolution). Gross morphologic abnormalities were documented. B-scans at the fovea were segmented using a longitudinal reflectivity profile. Logarithm of the minimum angle of resolution BCVA was obtained.

Main Outcome Measures: Grading was based on presence or absence of foveal pit and widening of the outer nuclear layer (ONL) and outer segment (OS) at the fovea. Quantitative measurements were obtained for comparing atypical foveal hypoplasia in achromatopsia. Best-corrected visual acuity was compared with the grade of foveal hypoplasia.

Results: Four grades of foveal hypoplasia were distinguished: grade 1, shallow foveal pit, presence of ONL widening, presence of OS lengthening; grade 2, grade 1 but absence of foveal pit; grade 3, grade 2 but absence of OS lengthening; grade 4, grade 3 but absence of ONL widening. There was significant difference in visual acuity (VA) associated with each grade ($P<0.0001$). Grade 1 was associated with the best VA (median VA, 0.2), whereas grades 2, 3, and 4 were associated with progressively poorer VA with a median VA of 0.44, 0.60, and 0.78, respectively. The atypical features seen with foveal hypoplasia associated with achromatopsia were characterized by decreased retinal and ONL thickness and deeper foveal depth.

Conclusions: A structural grading system for foveal hypoplasia was developed based on the stage at which foveal development was arrested, which helps to provide a prognostic indicator for VA and is applicable in a range of disorders associated with foveal hypoplasia. Atypical foveal hypoplasia in achromatopsia shows different characteristics.

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Normal foveal development occurs in stages in which the pit formation for the incipient fovea starts at fetal week 25 and the excavation is complete 15 to 45 months after birth.[1] Disruption of this developmental process leads to foveal hypoplasia, which is a characteristic morphologic abnormality associated with conditions such as albinism and *PAX6* mutations, or it may occur in isolation.[2–5] With the advent of optical coherence tomography (OCT), it is now possible to document the varying degrees of foveal hypoplasia that are likely to represent the different stages of arrested development of the fovea. This has introduced various terms, such as *fovea plana*, *foveal dysgenesis*, and *foveal aplasia*, to describe the structural variability associated with arrested development of the fovea.[6–8] Mietz et al[9] suggested that *foveal hypoplasia* is a more appropriate term rather than *aplasia* because hypoplasia encompasses both the partial and complete absence of a structure.

Recent studies have shown that OCT can be used as a diagnostic aid and prognostic indicator for the foveal hypoplasia.[4,10,11] In addition, structural–functional correlation

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