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Role of optical coherent tomography in early determining the structural changes at the macula in age related Maculodegeneration

Ahmed Fouad Mohammed Al-dulaimi[1], Ali Saeed Jerges Al-banaa[2]
[1-2] Ninavah Health Directorate, Ninavah, Iraq

Abstract
Patients with age-related macular degeneration (AMD) are discovered at very late stage of the disease when they usually complain of central blurring of vision and decrease ability to read in dim light. It develops due to many causes such as poor circulation in choroidal vessels. Optical coherence tomography (OCT) was proved as a vital investigation in the diagnosis and improving the efficiency of clinical (dynamic) monitoring of patients with AMD. Prospective case series study was performed on 150 patients, through firm follow up, investigations and examinations over a period of time. We noticed that patients develop AMD changes during their visits.

Keywords: ophthalmologists; age related macular degeneration; histological diagnosis; optical coherence tomography

1. Introduction

Introduction

Age-related macular degeneration (AMD) is a bilateral ocular condition that affects the central area of retina known as the macula. The fovea lies at the center of the macula and is approximately 2 mm in diameter. AMD is one of the most common eye disease in persons older than 50 years (Fig.1 Clinically, AMD is classified into non-exudative "dry" or atrophic form and exudative "wet" or neo-vascular form. More severe vision loss is typically associated with the "wet" form that occurs in about 15% of all patients with AMD but up to 20% of legal blindness from AMD is due to the "dry" form. Etiological factors, as shown by research results can be poor circulation in choroidal vessels, changes in the activity of biochemical processes of trace elements in the blood and so O In recent years, new methods of medical, surgical treatment technology using laser radiation appeared in the treatment of AM To determine the most appropriate medical tactics, it's necessary to diagnose pathological changes in the retina. In addition to traditional diagnostic methods (ophthalmoscopy), optical coherence tomography (OCT) was used in ophthalmology, which enables to obtain high-resolution (10 microns) real-time image layering structure of retina in the macular area and adjacent vitreous body without contact with eye of the patient, quantitatively and qualitatively assess the condition of the retina in AM Assessment of the retina using OCT makes it possible to determine the extent of the pathological process, the nature of structural changes in the macular area of the retina, the most important functional significance in areas of the retina, to choose adequate policies and dynamic individual treatment monitoring in patients with AMD. This study Consider the possibility of OCT to improve the efficiency of clinical (dynamic) monitoring of patients with AMD. This study was done to conduct clinical assessment of the body of patients with different stages of AMD, perform OCT in patients with AMD and perform relationship between the clinical condition of the organ of vision patients with AMD and retinal morphological features according to OCT.

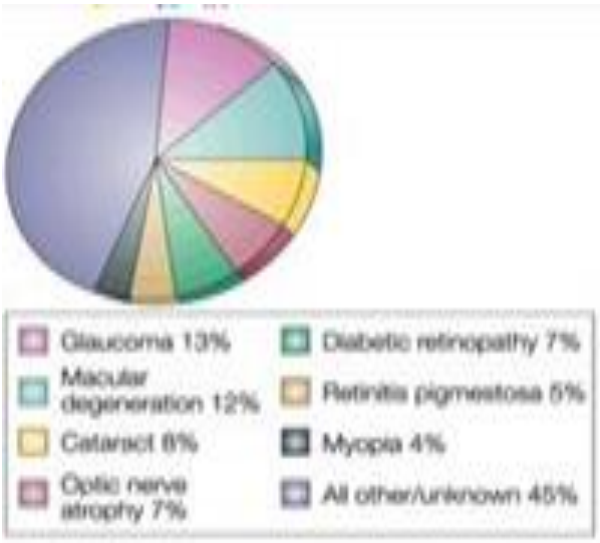

Fig 1: rate of AMD among other ophthalmological pathology

Methods

prospective case series, 150 eyes of 75 patients (45female and 30 male) with healthy general condition and no recent pathological eye condition and free of AMD, most of them were educated, cooperative, living or working at Odessa city and followed up for 18 months at Filatov institute of eyes diseases and tissues therapy between April 2011 and October 2012. They were enrolled in this study. The study was conducted in accordance with the Institutional Guidelines of the University of Odessa and was approved by the Institutional Review Board study. Before the initial investigation, all patients underwent baseline ophthalmic examinations, which included best correlated visual acuity (BCVA), fundus examination, optical coherence tomography (OCT) using an RTVue-100 fluorescein angiography (FA) and indocyanine green angiography (ICGA). All patients were followed up for more than 20 months. At each visit, fundus examination, BCVA, FA and ICGA were performed. OCT was performed every 2 months when development of AMD was suspected and clinical findings during the follow-

up examinations. The inclusion criteria for this study were patient age older than 50 years so we divided them to 5 groups according to their age to group A (50 years – 55 years), group B (55 years – 60 years), group C (60 years – 65 years), group D (65 years – 70 years) and group E (70 years – above). Every group was examined completely in hospital, examinations include CBC, blood chemistry, urine test, blood lipid profile, U&E, daily blood pressure monitoring, frequent ophthalmic examination. According to OCT test and the results we compared it with abnormal change with the tests mentioned above to correlate to development of AMD.

Results

Table 1: Data gained From members of group A

(group A)	visual acuity		I.O.P		Amsler-grid test		Opthalmo- scope		Slit- lamp		OCT		OCT		OCT			OCT		OCT
	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE
Patient NO.1	20/30	20/40	16	18	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.2	20/60	20/80	14	16	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.3	20/80	20/80	15	12	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.4	20/40	20/60	16	17	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.5	20/60	20/80	14	15	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.6	20/80	20/40	16	13	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.7	2080/	20/120	14	15	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.8	20/30	20/40	17	16	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.9	20/80	20/60	14	14	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patien NO.10	20/80	20/120	15	14	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.11	20/40	20/30	13	13	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.12	20/40	20/60	15	13	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.13	20/80	20/80	15	17	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.14	20/120	20/80	17	16	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.15	20/60	20/80	13	16	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve

Table 2: Data gained From members of group B

(group B)	visual acuity		I.O.P		Amsler-grid test		Opthalmo- scope		Slit- lamp		OCT		OCT		OCT		OCT		OCT	
	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE
Patient NO.1	20/120	20/80	14	17	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.2	20/80	20/60	18	17	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.3	20/60	20/120	16	13	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.4	20/80	20/80	17	13	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.5	20/80	20/120	15	19	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.6	20/80	20/40	16	15	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.7	20/120	20/120	18	17	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.8	20/60	20/40	14	18	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.9	20/60	20/60	14	13	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.10	20/80	20/120	17	16	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve

Patient NO.11	20/80	20/120	14	18	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.12	20/40	20/80	19	16	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.13	20/80	20/60	14	16	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.14	20/40	20/80	13	15	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.15	20/80	20/40	16	17	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve

Table 3: Data gained From members of group C

(group C)	**visual acuity**		**I.O.P**		**Amsler-grid test**		**Opthalmo-scope**	**Slit- lamp**			**OCT**		**OCT**		**OCT**			**OCT**		**OCT**
	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE
Patient NO.1	20/60	20/80	16	17	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.2	20/120	20/120	13	14	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.3	20/80	20/80	18	16	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	**+ ve**	- ve
Patient NO.4	20/60	20/60	12	14	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.5	20/60	20/120	16	18	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.6	20/120	20/60	14	14	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.7	20/120	20/80	17	18	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.8	20/80	20/60	16	15	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.9	20/80	20/80	14	15	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.10	20/40	20/80	18	19	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.11	20/60	20/80	16	18	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.12	20/80	20/120	18	17	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.13	20/120	20/80	16	18	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.14	20/80	20/120	18	18	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.15	20/40	20/60	18	19	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve

Table 4: Data gained From members of group D

(group D)	**visual acuity**		**I.O.P**		**Amsler -grid test**		**Opthalmo- scope**		**Slit- lamp**		**OCT**		**OCT**		**OCT**		**OCT**		**OCT**	
	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE
Patient NO.1	20/120	20/80	17	18	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.2	20/60	20/120	14	15	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.3	20/80	20/80	17	14	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.4	20/120	20/80	18	15	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.5	20/120	20/120	17	18	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.6	20/80	20/120	16	17	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.7	20/60	20/80	19	18	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	**+ ve**	- ve	**+ ve**	- ve	**+ ve**	- ve
Patient NO.8	20/120	20/80	15	17	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.9	20/80	20/120	16	15	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient	20/120	20/80	18	17	- ve	- ve	No	No	No	No	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve

NO.10							changes	changes	changes	changes									
Patient NO.11	20/80	20/120	16	16	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	**+ ve**	- ve	**+ ve**	- ve
Patient NO.12	20/80	20/120	14	15	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.13	20/120	20/80	16	18	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.14	20/60	20/80	15	15	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.15	20/120	20/80	14	18	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve

Table 5: Data gained From members of group E

(group E)	**visual acuity**		**I.O.P**		**Amsler-grid test**		**Opthalmo- scope**		**Slit- lamp**		**OCT**		**OCT**		**OCT**		**OCT**		**OCT**	
	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE
Patient NO.1	20/80	20/120	18	14	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.2	20/120	20/80	17	18	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.3	20/80	20/120	17	15	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.4	20/60	20/80	15	16	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.5	20/80	20/120	15	16	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	**+ ve**	- ve	**+ ve**	**+ ve**	**+ ve**
Patient NO.6	20/80	20/120	17	12	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.7	20/80	20/60	11	13	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.8	20/80	20/120	14	16	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	**+ ve**	- ve	**+ ve**
Patient NO.9	20/120	20/80	12	17	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	**+ ve**	- ve
Patient NO.10	20/80	20/120	16	14	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.11	20/120	20/120	18	18	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.12	20/80	20/80	12	19	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve
Patient NO.13	20/120	20/60	13	17	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	**+ ve**	**+ ve**	**+ ve**
Patient NO.14	20/80	20/120	15	17	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	**+ ve**	- ve	**+ ve**	**+ ve**	**+ ve**
Patient NO.15	20/120	20/80	17	14	- ve	- ve	No changes	No changes	No changes	No changes	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve	- ve

Data gained from the members of the first two groups (A and B) through following them up for months show that, there is no signs of AMD noticed, visual acuity not changed, no metamorphopsia captured by Amsler-grid test, macula was normal colour, size, shape and no any significant changes of AMD noticed through examination of fully dilated peupil by direct ophthalmoscope and slit-lamp. OCT was done also at each visit so we can notice that there is no any structural changes in the retinal layers, normal fovial pit structure, no hypo or hyper reflected areas, retinal thickness at macular region range within normal limit (Table 1, 2).

Data gained from the members of group (C) show that One of them (patient) differ from the others when changes noticed at visit. We could find by OCT an AMD changes in the right eye not like others (Table 3).

Data gained from the members of group (D) show that

Two patients in this group (and) get changes; patient No.7 a female, during her 3rd control visit we could find by OCT an AMD changes in her right eye and the changes became more clear and obvious during next 4th and 5th control visit and patient No.11 a female during her 4th control visit we could find by OCT an AMD changes in her right eye and the changes became more clear and obvious at control visit (Table 4).

Data gained from the members of group (E) show that 5 patients who developed AMD changes during their visits; 1st one (patient no.5) male, and he got changes in the left eye only that we found it during his 3rd control visit and the changes became more clear and obvious during next 4th and 5th control visit. In addition he got a changes in his right eye at 5th control visit, 2nd one (patient no.8) female, and she got changes in her left eye only that we found during the 4th control visit before that she quite normal and these changes became more clear at 5th visit, one (patient no.9) male, and he got changes in the right eye only that we found during at 5rd control visit, one (patient no.12) female, and she has got changes in the left eye only that we found during her 4th control visit and the changes became more clear and obvious during next 5th control visit additionally, she has got a changes in her right eye during her last visit control and one (patient no.14) female, and she has got a changes in the left eye only that we found during her the 3rd control visit and the

changes became more clear and rapidly progressive during next 4th and 5th control visit in addition she got same changes in her right eye at 5th control visit (Table 5).

Discussion

AMD is a bilateral ocular condition that affects the central area of retina known as the macula. The macula lutea, which derives its name from the deposition of yellow xanthophyll pigments, is located temporal to the optic disc and is bounded by the temporal superior and inferior vascular arcades.

Although the macula comprises only four percent of retinal area, it is responsible for the majority of useful photopic vision. The fovea lies at the center of the macula is approximately 2mm in diameter.

The fovea is particularly well seen in vertical section view using OCT techniques in living eyes. The fovea contains the highest density of cone photoreceptor cells and is the only region of the retina where 20/20 vision is attainable. The macula accounts for almost 10% of the entire visual field.

Thus, lesions developing in this region can have a major impact on visual function. AMD has a tremendous impact on the physical and mental health of the geriatric population and their families. Prior to 1990, AMD of all forms was often referred to as "senile macular degeneration" or SMD, a reflection of the fact that the vision loss associated with AMD manifests late in life when most affected individuals are looking forward to enjoying retirement activities and maintaining independence. Instead, millions with AMD suffer bilateral central vision loss such that they can no longer drive, read a newspaper, prepare meals, or enjoy recreational activities. For many patients, the visual impairment associated with AMD means a loss of independence, depression, increased financial concerns and the need to adapt to vision loss at a time when they are likely suffering from other debilitating condition. Clinically, AMD is classified into non-exudative "dry" or atrophic form and exudative "wet" or neo-vascular form. More severe vision loss is typically associated with the "wet" form that occurs in about 15% of all patients with AMD but up to 20% of legal blindness from AMD is due to the "dry" form.

AMD is the most common cause of severe vision loss worldwide and characterized by the loss of central vision. Blindness due to AMD occurs at advanced age; over 80% of those affected become blind after 70 years of ag AMD has two forms: „wet" (i.e. neo-vascular and exudative) AMD and „dry" AMD. Dry AMD tends to progress more slowly than wet AMD. The prevalence of AMD in individuals aged 65–75 ranged between 9 and 25%.

It is higher in women [1.03%] than in men [0.90%] at 65–69 years of age, and changes with age, with a greater increase in women from1.03% at 65–69 years of age to 2.36% at 70–74 years of age. The proportion of visual impairment due to AMD has been found to vary as example 40% in France, 39% in Germany, 36.3% in the Netherlands, 16.30% in the European North of Russia, and 14% in Bulgaria. A pooled estimate of AMD prevalence showed that 3.5% of individuals 75 years or older in the UK had AMD. Complement Factor H is the first gene identified in multiple independent studies that confers a significant risk for the development of AMD. This finding, together with the subsequent identification of AMD-associated variants in the related complement genes BF and C2, provide compelling evidence that the innate immune system and, more specifically, uncontrolled regulation of the alternative pathway of complement, plays a central role in the pathobiology of AMD. At this point, the most likely scenario is that exposure to infection or some other triggering event in genetically susceptible individuals, coupled with impaired complement regulatory function leads to the sustained activation of complement cascade, drusen formation and eventually, development of AMD.

The emergence of this new paradigm of AMD pathogenesis sets the stage for the rapid development of early diagnostics, novel bioassays, and new animal models that faithfully mimic aspects of the disease process. Furthermore, the way is now paved for development of novel therapeutic interventions aimed at modulating the alternative pathway of complement in "at risk" individuals prior to the onset of choroidal neovascularization or geographic atrophy.

Now that the genetic basis for a major proportion of AMD cases has been elucidated, what additional scientific progress may be anticipated, and what will be the significance of these new findings for the diagnosis and treatment of AMD? In the near term, a more comprehensive understanding of the genetic basis of AMD should rapidly emerge. It will not be surprising, for example, if genetic polymorphisms in additional complement components, complement regulators and, possibly, immune system effectors and inflammatory mediators are implicated in AMD. Secondly, it may be anticipated that the gene variants linked to AMD also contribute to other prevalent age-related diseases where chronic, local inflammatory processes are involved. For example, a significant statistical relationship between the CFH Tyr402His "risk" variant and the incidence of myocardial infarction has recently been reported. Based upon this new genetic information, it will be possible to devise genetic screening tests that will identify those individuals who are most at risk of developing AMD later in life. This will enable clinicians to monitor susceptible individuals from an early age, and to develop and test new preventive treatments in the early stages of the disease. Finally, the development of new diagnostic and pharmacological approaches will be hastened by the identification of the alternative pathway of complement as a prime therapeutic target. As our understanding of the pathogenesis of AMD continues to improve, so does the prospects for new diagnostic and therapeutic approaches.

Hopefully, we will eventually eradicate AMD and dramatically improve the quality of life in our older generation.

OCT has the ability to verify the presence of neo- vascular disease and quantitatively evaluate treatment response. The utility of OCT as a guide for treatment is suggested by early clinical experience from many centers and results from the PrONTO study. Further studies using UHR- OCT may determine the role of screening high risk eyes for the early detection of neo-vascular AMD. OCT has been utilized as supportive data in some trials for the treatment of macular degeneration, though its incorporation as a key endpoint in the evaluation of treatments for neo-vascular AMD has yet to be conclusively established. OCT will continue to be a key component in the evaluation, treatment and development of new therapeutic modalities in patients with AMD.

Conclusion

AMD, the leading cause of worldwide blindness in the elderly especially in seventh decade and older.

Treatment of AMD depends on its stage or degree of retinal damage, so whenever it early diagnosed we have a good

chance for treatment, but if we diagnosed it late, our chance decreased with limited option.

Patients with AMD diagnosed in hospital based on their complains as they suffering from Central blurring or metamorphopsia, decrease reading ability especially in dim light, difficulty with glare,difficulty with dark and light adaptation (these symptoms usually develop at late stages of the disease). also, we can diagnose the disease by simple and routine methods (opthalmoscopy, slit lamp, Amsler-grid test ….) so it can‟t be captured at early stages.

OCT improve our ability to diagnose retinal pathology and anatomical changes.

OCT considered as the best investigation when compared with others such as FA because the OCT is non-contact, non-invasive, no risk for any complication, easy to use, more informative throw production micrometer-resolution,cross sectional image of ocular tissue, based on imagining reflected light, two dimensional, false color image of the back scattered light from different layer in the retina and produce relend thickness map.

Recommendations

Depending on the results of this research, we recommend that follow up elderly patients especially > 70 years old with high risk factors (DM, obesity, smoking, etc) with regular examination by OCT will help us to discover AMD earlier. Discovering the disease in its early stages will help us to delay the progression of the disease and give us better management and prognosis.

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