



A Hospital Based Study of Education and Risk of Age Related Macular Degeneration

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Abstract: The present study was aimed to study the demography and risk of age related macular degeneration. Age-related macular degeneration (AMD) is one of the main socioeconomical health issues worldwide. This is prospective study include all patients of age related macular degeneration above 50 years of age presenting in the Department of Ophthalmology at Dr.RPGMC Tanda. Total 86 patients were examined. There were 39 (45.35%) who were illiterate while 43 (50%) were standard 1st to standard 10+2 and 4 were Graduate and above. Finding showed that prevalence of ARMD was higher in illiterate or have low education when compared to Graduate and above.

Index Terms - Education, Age-related Macular Degeneration

1. Introduction

Age related macular degeneration (ARMD) represents a spectrum of gradual ageing resulting in degenerative changes in the human macula. It is a major cause of blindness and severe visual loss in older people in developed countries¹. It is the third leading cause of blindness worldwide and accounts for 8.7% of blind persons globally. In India, the prevalence of ARMD ranges between 1.4% to 1.8% in different epidemiological studies. It results in progressive and irreversible loss of central vision affecting the macula of the eye and involve the retinal pigment epithelium (RPE), Bruch's membrane (BM) and choriocapillaries².

Macular degenerative changes have typically been classified into two clinical forms, dry or wet, both of which can lead to visual loss. In the dry form visual loss is usually gradual. Ophthalmoscopy reveals yellow subretinal deposits called drusen, or retinal pigment epithelial irregularities, including hyperpigmentation or hypopigmentary changes. Larger drusen may become confluent and evolve into drusenoid retinal pigment epithelial detachments (PEDs). These drusenoid RPE detachments often progress to geographic atrophy and less frequently to neovascular ARMD. Geographic atrophy involving the centre of the macula leads to visual loss. Each of these signs can be further subdivided according to the number and size of the lesions.³

In the wet (exudative) form, vision loss can occur suddenly, when a choroidal neovascular membrane leaks fluid or blood into the sub pigment epithelial or sub retinal space. Serous RPE detachments with or without coexisting choroidal neovascularization (CNV) are also classified as the wet form. According to international classification and grading system⁴, early age related maculopathy (ARM) is defined as the presence of drusen and RPE irregularities, and the terms late ARM and AMD are limited to the occurrence of geographic atrophy and neovascular disease.³ Prevalence, incidence, and progression of all forms of ARMD rise steeply with increasing age. ARMD is associated with elevated level of white blood cells, fibrinogen, low-density lipoproteins, cholesterol, homocystein and C-reactive protein^{5,6,7}.

Lipids are deposited in Bruch's membrane possibly from failure of the retinal pigment epithelium to process cellular debris. These deposits are known as basal linear and basal laminar deposits. Only later in the disease process are drusen visible. Drusen that elevate the RPE reveal that they contain lipid, amyloid, complement factors and additional cellular components. The appearance of drusen is preceded by thickening of Bruch's membrane, degeneration of elastin and collagen with in Bruch's membrane with calcification of Bruch's membrane with increased level of advanced glycation end products and accumulation of lipids and exogenous proteins. These changes lead to hydrophobic barrier to impede the passage of fluid and nutrients between the choroid and outer retina resulting in relative ischemia.⁸

Treatment for ARMD includes dietary supplementation of anti-oxidants, laser therapy (thermal photocoagulation, photodynamic therapy and surgery), anti-vascular endothelial growth factor (VEGF) and combination therapy (laser along with anti-VEGF treatment) are the current treatment modalities available in ARMD. These treatments are offered depending on the clinical phenotype to retard progression of the disease, as complete reversal is not possible. Majority of the treatment strategies are available for wet ARMD. Dry ARMD is currently managed with dietary supplementation of anti-oxidants that are primarily given to reduce the risk of ARMD development and progression.

2. Methods

Place of Study

Department of Ophthalmology, Dr.RPGMC, Tanda.

Study Population

All patients of age related macular degeneration above 50 years of age presenting in the Department of Ophthalmology at Dr.RPGMC Tanda.

Study Design

Prospective study.

Study period

One year.

Inclusion criteria

- All the patients of age related macular degeneration of age above 50 years presenting in Department of Ophthalmology, Dr.RPGMC Tanda.

Exclusion criteria

- Patients with predominantly other types of retinopathies.
- Patients who refuse to give consent.
- Patients with dense corneal and lenticular opacities.

Study Procedure

All the patients of age-related degeneration attending the Out Patient Department of Ophthalmology at Dr. RPGMC Kangra at Tanda whether symptomatic (i.e. complaining of diminished vision, scotoma, micropsia or macropsia) or asymptomatic (i.e. with ophthalmoscopic features suggestive of ARMD) were included in the study. Patients particulars like name, age, sex and address was recorded. A detailed ocular history from all the patients was recorded. Family history along with personal history of smoking was taken. They were enquired about the number of packs/years he/she had been smoking. Packs/years were calculated by multiplying the number of packs with years of smoking. The number of bidis taken by the patient per day were converted to cigarettes as four bidis are equal to one cigarette. One pack of cigarette is equal to twenty cigarettes. In India a packet has 10 cigarettes rather than 20 so the number of packs were divided by two.⁹ Social history, in which the occupation of the patient and educational status was noted. Serum CRP level of all patients was recorded. Any medical history, diabetes and hypertension was also recorded. Complete systemic examination of the patients was done i.e. pulse rate, blood pressure, respiratory rate and cardiovascular system examination.

Detailed local examination of both the eyes was done, which included the following:-

- Visual acuity using Snellen's chart.
- Retinoscopy using Self-illuminated retinoscope was done after full dilatation of pupil using Tropicamide 1% eye drops.
- Detailed examination of anterior segment with slit lamp was performed.
- Amsler grid chart was used to detect micropsia, macropsia and metamorphosia. Type-1 Amsler grid chart was used to evaluate 10^0 of visual field surrounding fixation. Type-1 chart comprised of 10 cm square containing 400 small squares each of size 5 mm which when viewed at one-third of meter subtends an angle of 1^0 .
- Direct ophthalmoscopy with 90D and Indirect ophthalmoscopy was done after full dilatation of pupil with Tropicamide 1% eye drops.

Following criteria were used to define ARMD and Drusen size:

Small Drusen:

Drusen which were less than 63um.

Medium:

Drusen which were of the size of 63um to125um.

Large:

Drusen which were 125um in size or more i.e. the width of a retinal vein as it crosses the optic nerve head.¹⁰

3. Results:

The present study was aimed to study risk factors for age related macular degeneration. All patients of age related macular degeneration above 50 years of age presenting in the Department of Ophthalmology Dr. RPGMC Tanda during the period of one year were included in the study. Total 86 patients were examined.

Education

:Our study showed that most of the 50% patients (n=43) had education level category of standard 1 to 10+2, followed by illiteracy (n=39; 45.35%). There were only 4 graduate or above (4.65%). (table ; fig).

Out of 39 (45.35%) patients, 26 (30.23%) patients were in early ARMD followed by 7 (8.14%) patients in exudative, and 6 (6.98%) patients in intermediate ARMD. Out of 43 (50%) patients with standard 1st to standard 10+2 education level, 26 (30.23%) were in early ARMD, followed by 9 (10.47%) patients in exudative, and 8 (9.3%) patients in intermediate ARMD.

Out of 4 (4.65%) graduate and postgraduate patients, 3(3.49%) patients were in early ARMD and 1 (1.16%) patients in intermediate ARMD. There was no patient in exudative ARMD.

Table .Distribution of Education status with Early, Intermediate and Exudative ARMD

| Education Status N=86 | Stages of ARMD | | | Total No. (%) |
|--------------------------|------------------|-------------------------|----------------------|------------------|
| | Early No. (%) | Intermediate No. (%) | Exudative No. (%) | |
| Illiterate | 26 (30.23%) | 6 (6.98%) | 7 (8.14%) | 39 (45.35%) |
| 1st to 10+2 | 26 (30.23%) | 8 (9.3%) | 9 (10.47%) | 43 (50%) |
| Graduate or above | 3 (3.49%) | 1 (1.16%) | 0 | 4 (4.65%) |

4. Discussion:

In this study, ARMD was found more in patients who were illiterate or have low education (standard 1st to standard 10+2) when compared to patients who were graduate or above. Most of the patients (50%), had education level between 1st to 10+2, 30.23% of them had early ARMD while 19.77% had intermediate/exudative ARMD. Illiterate were 45.35%, 30.23% of them were in early stage of ARMD whereas 15.12% were in intermediate or exudative form of ARMD. 4.65% were graduate and postgraduate. 3.49% were in early ARMD while 1.16% were having intermediate ARMD. Most of the patients were illiterate and of lower education while graduate and above were the least.(table.).

The Eye Disease Case-Control Study Group in their review of 421 patients found that risk of ARMD was reduced in persons with higher level of education¹¹. AREDS Report No 19 in their study of 788 patients observed significant correlation between geographic atrophy and individuals with less education¹². Buch et al concluded in their study that prevalence of early as well as late ARMD was more among illiterates than among literates¹³. Thus our study correlates with the above studies^{12,11,13}. This can be explained by the fact that literates engaged in the daily work of reading are more aware of their visual handicap and hence seek early medical intervention. They take good nutritious diet and are less exposed to sunlight.

5. Conclusions:

Conclusions This study further confirms the prevalence of ARMD higher in illiterate and low education level when compared to higher education level..

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