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A Hospital Based Study Of Eating Habits And Risk Of Age Related Macular Degeneration

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Abstract: Age related macular degeneration is leading causes of vision loss in older adults worldwide .Emerging evidence suggests that dietary habits may influence the risk and progression of ARMD.The present study was aimed to study the eating habits 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 40(46.51%) patients who were vegetarian while 46(53.49%) patients were non vegetarian. Finding indicated that ARMD was more in non-vegetarians.

Index Terms - Eating Habits, 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 countries[1]. 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 choriocapillaries[2].

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. 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. According to international classification and grading system[4], 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 ofARMD rise steeply with increasing age. This is evident in the Framingham Eye Study,where a 17 fold increased risk of ARMD was noticed in the oldest patient as compared to the youngest patient.[5]ARMD is associated with elevated level of white blood cells, fibrinogen, low-density lipoproteins, cholesterol, homocystein and C-reactive protein.[13,14,15]

Pathogenesis of the ARMD is that 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[16]

Treatment strategies for ARMD includes various modalities like 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. [2]With increase in life expectancy, ARMD will become a public health concern in our country in near future[1].

2. Objectives

To study the eating habits and risk of age related macular degeneration.

3. Methods

Place of Study

Department of Ophthamlology,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 dietary intake was assessed using validated food frequency questionnaire and participants were categorized into different dietary patterns based on nutrient and food group consumption.ARMD status was confirmed through clinical examination and statisticacal analyse were performed to identify associated between dietary factors and ARMD risk[60]

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 wasalso 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.
- Intraocular pressure was recorded.

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. thewidth of a ratinalvein as it crosses the optic nerve head.[61]

4. 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.

Eating Habits

There were 40 (46.51%) patients who were vegetarian while 46 (53.49%) patients were non-vegetarian. It was found statistically significant. Out of 40 (46.51%) vegetarian patients, 32 (37.21%) patients were in early ARMD followed by 6 (6.98%) patients in intermediate, and 2 (2.33%) patients in exudative ARMD. Out of 46 (53.49%) non-vegetarian patients, 23 (26.74%) patients were in early ARMD followed by 14 (16.28%) patients in exudative and 9 (10.47%) patients in intermediate ARMD. This study shows that Intermediate/ExudativeARMD was significantly higher in non-vegetarians however we could not find any study which compared ARMD among vegetarians and non-vegetarians, this can be explained by the fact that rich dietary intake of lycopene,zeaxanthin and green leafy vegetables lower the risk of ARMD. It was found statistically significant (P=0.005)

Table . Distribution of Veg/Non-veg with Early, Intermediate and Exudative ARMD

Eating habits N=86	Stages of ARMD			Total No. (%)
	Early No. (%)	Intermediate No. (%)	Exudative No. (%)	
Vegetarian	32 (37.21%)	6 (6.98%)	2 (2.33%)	40 (46.51%)
Non-vegetarian	23 (26.74%)	9 (10.47%)	14 (16.28%)	46 (53.49%)

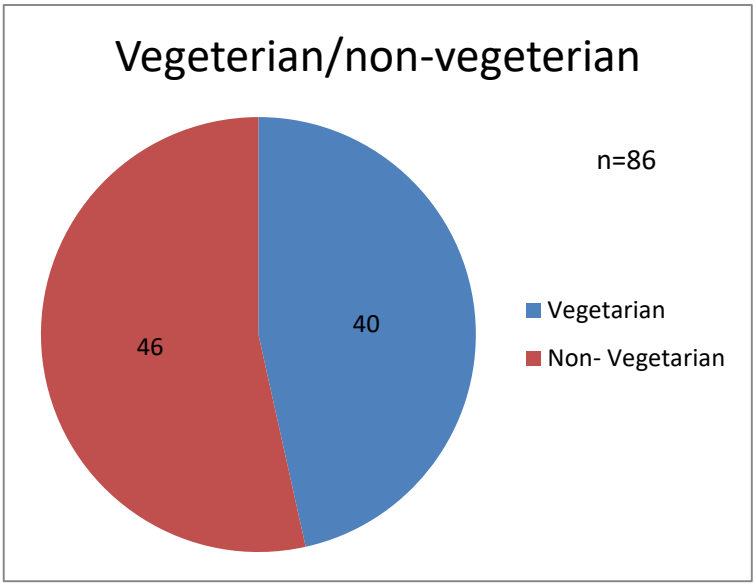

Fig. Distribution of Veg./Non-veg. with ARMD

5 Discussion

the finding of this hospital based study underscore the critical role of dietary habits in influence the risk and progression of age related macular degeneration .ARMD ,as a multifactorial condition ,involves oxidative stress and cronic inflammation as key pathogenic mechanisms.the study supports the hypothesis the specifics dietary components can modulate these processes and potentially alter disease outcome.

ARMD was significantly higher in non-vegetarians(53.49%). Of them 26.74% had early ARMD, 10.47% had intermediate and 16.28% had exudative ARMD. There were 46.51% patients who were vegetarians, 37.21% of them had early ARMD while 6.98% had intermediate and 2.33% had exudative ARMD. However, we could not find any study which compared ARMD among vegetarians and non-vegetarians. ARMD was more among non-vegetarians, this can be explained by the fact that rich dietary intake of lycopene, zeaxanthin and green leafy vegetables lowers the risk of ARMD. It was found statistically significant (P=0.005)

6. Conclusions:

The study found a significant association between certain eating habits and the risk of developing or worsening age related macular degeneration harmful diets such as diets diets in high in saturated fats,trans fats refined sugars and processed food were linked to increased risk of ARMD ..These foods may contribute to oxidative stress and inflammation, which are key factors in ARMD. Promoting healthy eating habits particularly those rich in antioxidants and anti inflammatory nutrients, can play a crucial in preventing ARMD and slowing progression. these finding emphasize the importance of dietary intervention as part of Armd preventioin and management strategies.

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