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Original Research Paper

Ophthalomology

A HOSPITAL BASED STUDY OF HYPERTENSION AND RISK OF AGE RELATED MACULAR DEGENERATION

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ABSTRACT The present study was aimed to study the hypertension 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 34(39.53%) patients who were hypertensive while 52(60.47%) patients were non-hypertensive. Findings showed that hypertension was not implicated as a causative factor in ARMD.

KEYWORDS : Hypertension, Age-related Macular Degeneration.

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 been classified into two 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 hyper-pigmentation 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 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]

ARMD, being a complex genetic disorder, is attributed to multiple genes with varying magnitudes of effect. Along the genetic variants, environmental factors such as age, smoking, gender and body mass index (BMI) play a major role in the disease pathogenesis. Gene-gene and gene-environment interactions are the hallmarks of ARMD susceptibility.[2.]

ARMD is associated with elevated level of white blood cells, fibrinogen, low density lipoproteins, cholesterol, homocystein and C-reactive protein.[5,6,7.]

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.[8]

Treatment strategies 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.

3. 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 macular 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. Any medical history, diabetes and hypertension was recorded.

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 to 125um.
Large: Drusen which were 125um in size or more i.e. the width of a major vein at the disk edge.[10]
Early ARMD: When there were few (approximately <20) medium size drusen or pigment abnormalities i.e. increased or decreased pigmentation.
Intermediate ARMD: When there was at least one large drusen or numerous medium size drusen 20 or more when drusen boundaries were indistinct or soft and approximately 65 or more when the drusen boundaries were distinct or hard or the presence of geographic atrophy that did not extend under the centre of the macula.
Advanced/Late/Exudative: When geographic atrophy extended under the centre of the macula or there were CNV(choroidal neovascularisation) or exudative maculopathy.

4.RESULT

Hypertension

There were 34 (39.53%) patients who were hypertensive while 52 (60.47%) patients were non hypertensive. It was found statistically significant (P=0.016)

Among 34 (39.53%) hypertensive patients, 27 (31.4%) patients were in early ARMD followed by, 4 (4.65%) patients in intermediate, and 3 (3.49%) patients in exudative ARMD. Among 52(60.47%), non-hypertensive patients, 28(32.56%) were in early ARMD, 11(12.79%) patients in intermediate and 13(15.12%) patients were in exudative form of ARMD. Hence in this study prevalence was more in non-hypertensive patients when compared to hypertensive patients.

Table Distribution of hypertension with Early, Intermediate and Exudative ARMD

N=86	Diagnosis				P Value
	Early	Inter-mediate	Exudative	Total	
Hyper-tension	27 (31.4%)	4 (4.65%)	3 (3.49%)	34 (39.53%)	(0.016)
Non- Hyper-tension	28 (32.56%)	11 (12.79%)	13 (15.12%)	52 (60.47%)	

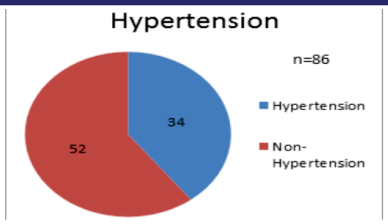

Fig. Distribution of hypertension with ARMD

5. DISCUSSION

Our study showed that ARMD was higher in non-hypertensive patients when compared to hypertensive patients. In present study of 86 subjects of ARMD, hypertension was absent in 60.47% subjects and was present in 39.53%. Hyman et al in their study found that neovascular ARMD is associated with moderate to severe hypertension[11]. AREDS Report No 3 in their study found that prevention of hypertension may reduce the risk of developing ARMD[12]. Blumenkranz et al in their study of risk factors of ARMD failed to find any association of hypertension with neovascular complication of ARMD[13]. Chaine et al in their study of 1844 patients of ARMD failed to find any significant association between systemic hypertension and ARMD[14]. Vine et al in their study of 79 affected individuals and 77 unaffected individuals from ARMD did not find any significant differences between cases and controls in terms of hypertension[15].

Hence this study goes well with published studies[13,14,15.] in which elevated hypertension was not implicated as a causative factor in ARMD.

6. CONCLUSIONS.

This study showed that hypertension was not implicated as a causing factor for ARMD.

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