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

Dr.Bhup Singh(Ophthalmologist)

Dr. Rajendra Prasad Government Medical college Himachal Pradesh

Abstract: The present study was aimed to study smoking 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 32 (37.21%) patients who were smokers while 54 (62.79%) patients were non-smokers. Statistical analysis correlation was applied.Finding indicated that smoking significantly increases the risk of age related macular degeneration.

Keywords:Smoking,Age related Mascular Degeneration

I. 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[13].

It is the third leading cause of blindness worldwide and accounts for 8.7% of blind persons globally. It is estimated that by the year 2020,at least 80 million will be affected by ARMD 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 involves the retinal pigment epithelium (RPE),Bruch`s membrane (BM) and choriocapillaries[9].

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[14].

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 internationalclassification and grading system, early ARMD is defined as the presence of drusen and RPE irregularities, and the term late ARMD islimited to the occurrence of geographic atrophy and neovascular disease[1].

Prevalence,incidence, and progression of all forms ofARMD rise steeply with increasing age. This is evidentin the Framingham Eye Study,where a 17-fold increased risk of ARMD was noticed in the oldest patient (85 years) as comparedto the youngest patient (52 years)[11]. the management of ARMD with a review of the current and the new treatments. They found that although there was no treatment for advanced dry ARMD (geographic atrophy),there had been considerable advances in the management of neovascular ARMD (nARMD).Established therapies for nARMD include laser photocoagulation and photodynamic therapy(pDT),but these have largely been superseded by agents which block the action of vascular endothelial growth factor(anti-VEGF agents).Current preventive strategies involve cessation of smoking and use of specific nutritional supplements to reduce the risk of developing neovascular ARMD[6].

Smoking is a major modifiable risk factor for AMD. The association between smoking and AMD has been consistently demonstrated in many epidemiological studies carried out within different populations in the last decades confirming previous clinical impressions. Cross-sectional studies and prospective cohort studies have described the natural history of the disease and its associations with risk factors, where smoking has been the most consistent factor associated with geographic atrophy and neovascular AMD[18].

2 Objectives

To study the smoking and risk of age related macular degeneration among smoker and non-smoker

3Methods

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 thepatients of age related macular degeneration of age above 50years 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 ormacropsia) 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.

Dietary history was taken from all the patients. Subjects consuming Non Vegetarian food three times a week or more were grouped as Non Vegetarians and those who consumed it less than this were classified as Vegetarians.

A personal history regarding smoking habits was taken from the patients. 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 packet has 10 cigarettes rather than 20 so the number of packs were divided by two.[60]

Social history,in which the occupation of the patient and educational status was noted. History of chronic diseases including diabetes and hypertension were 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.

- Slit lamp biomicroscopy with 90D and Indirect ophthalmoscopy was done after full dilatation of pupil with Tropicamide 1% eye drops.

- Intraocular pressure was recorded with Schiotz tonometer.

Following criteria were used to define ARMD and Drusen size:

Small Drusen:

Drusen which were less than 63μm.

Medium:

Drusen which were of the size of 63μm to 125μm.

Large:

Drusen which were 125μm in size or more i.e. the width of a retinal vein as it crosses the optic nerve head.[61]

4 **Result**

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. Age and gender distribution of subjects are shown in fig.1 and fig. 2

Table 1. Distribution of Age-group with Early, Intermediate and Exudative ARMD

Age group (Years)	Stages of ARMD			Total No. (%)
	Early No. (%)	Intermediate No. (%)	Exudative No. (%)	
50-60	18 (20.93%)	3 (3.49%)	2 (2.32%)	23 (26.74%)
61-70	27 (31.39%)	4 (4.65%)	6 (6.98%)	37 (43.02%)
71-80	8 (9.30%)	6 (6.98%)	6 (6.98%)	20 (23.26%)
81-90	2 (2.32%)	2 (2.32%)	2 (2.32%)	6 (6.98%)
Total	55	15	16	86

Smoking

There were 32 (37.21%) patients who were smokers while 54 (62.79%) patients were non-smokers. (table 2; fig 2).

Out of 32 (37.21%) smoker patients, 17 (19.77%) patients were in early ARMD followed by 10 (11.63%) in exudative ARMD, and 5 (5.81%) in intermediate ARMD.

Out of 54 (62.79%) non-smokers patients, 38 (44.19%) patients were in early ARMD followed by 10 (11.63%) patients in intermediate, and 6 (6.98%) patients in exudative ARMD.

Table 8. Distribution of Smoker with Early, Intermediate and Exudative ARMD

Smoking N=86	Stages of ARMD			Total No. (%)
	Early No. (%)	Intermediate No. (%)	Exudative No. (%)	
Smoking	17 (19.77%)	5 (5.81%)	10 (11.63%)	32 (37.21%)
Non-smoking	38 (44.19%)	10 (11.63%)	6 (6.98%)	54 (62.79%)

Thus, the age distribution among ARMD patients shows that the number of patients with ARMD increase with age and the incidence of intermediate/exudative form of ARMD in smoker than nonsmoker. It was found statistically significant (P=0.014).

5 Discussion

The aim of the present study was to ascertain risk factors for age related macular degeneration. All patients of ARMD above 50 years of age presenting in the Department of Ophthalmology Dr. RPGMC Tanda for one year were included in the study. A total of 86 patients with age ranging from 50 to 90 years were included. Males were 47.67% and 52.33% were females. Most of the patients were in early ARMD (63.95%), followed by exudative (18.60%) and intermediate ARMD (17.44%). Results of this study confirm the strong association of smoking with late ARMD. Compared with participants who never smoked, Our data are consistent with results of recent epidemiological studies.[7,4,16] As found in 2 other studies,[15,17]there was a trend for increasing risk of late ARMD with increasing number of pack-years of smoking, a measure of lifetime exposure that reflects the duration and amount of both current and past smoking. Participants in the higher category (≥40 pack-years) had a 5.2-fold increased risk compared with never smokers. The risk of smoking has also been estimated in a meta-analysis from six prospective cohort studies, five case-control studies, and five cross-sectional studies. Significant increases in AMD risk were seen for current- versus never-smokers. The odds ratio for case-control studies was 1.78 (95% CI: 1.52–2.09), and it was 3.58 (95% CI: 2.68–4.79) for cross-sectional studies. The relative risk (RR) obtained through analysis of prospective cohort studies was 1.86 (95% CI: 1.27–2.73) [2]. Similar results were also found in a previous meta-analysis [5].

Conclusions This study further confirms the significant adverse effect of smoking on late ARMD. Former smokers seem to remain at high risk for ARMD. In addiction study confirm smoking strongly increased the long term risk of ARMD. It is, therefore, urgent to determine factors that may lead to prevention of this condition.

REFERENCES

[1]Bird AC, Bressler NM, Bressler SB, Chisholm IH, Coscas G, Davis MD, et al. An international classification and grading system for age-related maculopathy and age-related macular degeneration. Surv Ophthalmol.1995;39:367-74.

[2]Chakravarthy U, Wong TY, Fletcher A, et al. Clinical risk factors for age-related macular degeneration: a systematic review and meta-analysis. *BMC Ophthalmology.* 2010;10(1, article 31)

[3]Cheung G, Li X, Cheng CY, Zheng Y, Mitchell P, Wang JJ, et al. Prevalence and risk factors for age related macular degeneration in Indians: a comparative study in Singapore and India. Am J Ophthalmol.2013;155:764-73.

[4]Christen WGGlynn RJManson JEAjani UABuring JE A prospective study of cigarette smoking and risk of age-related macular degeneration in men. *JAMA.* 1996;2761147- 1151

[5] Cong R, Zhou B, Sun Q, Gu H, Tang N, Wang B. Smoking and the risk of age-related macular degeneration: a meta-analysis. *Annals of Epidemiology.* 2008;18(8):647–656.

[6]Cook H, Patel P, TufailA . Age-related macular degeneration: diagnosis and management. Bri Med Bulletin.2008;85:127-49.

[7]Eye Disease Case-Control Study Group, Risk factors for neovascular age-related macular degeneration: the Eye Disease Case-Control Study Group. *Arch Ophthalmol.* 1992;1101701- 1708

[8]Jonasson F , Amersson A , Eiriksdottir G, Haris T, Launer L, Meuer S. Prevalence of age-related mcular degeneration in old persons. Age, gene/environment susceptibility. Reykjavik study. Ophthalmology.2011;118:825-30.

[9]Katta S, Kaur I,Chakrabarti S.The molecular genetic basis of age-related macular degeneration: an overview. J Genetics.2009;88:425-6.

[10]Klein RWang QKlein BEMoss SEMeuer SM The relationship of age-related maculopathy, cataract, and glaucoma to visual acuity. *Invest Ophthalmol Vis Sci.* 1995;36182- 191.

[11]Leibowitz HM, Krueger DE, Maunder LR, Milton RC, Kini MM, Kahn HA, et al. The Framingham Eye Study monograph. Surv Ophthalmol.1980;24:335-610.

[12]Macular Photocoagulation Study Group, Laser photocoagulation for juxtafoveal choroidal neovascularization: five-year results from randomized clinical trials. *Arch Ophthalmol.* 1994;112500-509

[13]Qureshi T, Nazir M, Abdullah N, Fazili A, Maqbool R, Ramzan R. Profile of age related macular degeneration in a Kashmiri population-a hospital based study in tertiary care hospital in Kashmir, India. Global J Med Public Health. 2013;2:1-7.

[14] Seddon JMWillett WCSpeizer FEHankinson SE A prospective study of cigarette smoking and age-related macular degeneration in women. *JAMA.* 1996;2761141- 1146

[15]Seddon JM, Chen CA. Epidemiology of age-related macular degeneration. In: Ryan JS, editor. Retina. 4[th]ed.China: Elsevier Mosby;2006.p.1018-24.

[16]Tamakoshi AYuzawa MMatsui M et al. Smoking and neovascular form of age related macular degeneration in late middle aged males: findings from a case-control study in Japan. *Br J Ophthalmol.* 1997;81901- 904

[17]Vingerling JRHofman AGrobbee DEde Jong PT Age-related macular degeneration and smoking: the Rotterdam Study. *Arch Ophthalmol.* 1996;1141193- 1196

[18]Woo J, Sanjay S ,Guan Au,Eong K. The epidemiology of age-related macular degeneration in the Indian subcontinent. Acta Opthalmol.2009;87:262-269.