East African Scholars Journal of Medical Sciences
Abbreviated Key Title: East African Scholars J Med Sci
ISSN: 2617-4421 (Print) & ISSN: 2617-7188 (Online)
Published By East African Scholars Publisher, Kenya

OPEN ACCESS

Volume-8 | Issue-7 | Jul-2025 | DOI: https://doi.org/10.36349/easms.2025.v08i07.004

Original Research Article

Assessment of Risk Factors in Age Related Macular Degeneration in Tertiary Care Hospital

Dr. Ananta Raina[1*], Dr. Ashok K Sharma[2]

[1]Senior resident, Department of Ophthalmology, GDMC Dehradun.
[2]Professor, Department of Ophthalmology, GMC Jammu.

Article History
Received: 24.05.2025
Accepted: 10.07.2025
Published: 16.07.2025

Journal homepage:
https://www.easpublisher.com

Quick Response Code

Abstract: ***Purpose***: The purpose of this study is to assess risk factors of AMD and its demographic characteristics in the population. Age related macular degeneration is one of the reasons which affects quality of vision directly and eventually overall health. ***Materials & Methods***: The prospective, observational, hospital-based study was conducted. Patients attending eye OPD above the age of 40 years with complaints of diminution of vision and distorted vision were evaluated and detailed ophthalmic examination was done. Particulars of patients were taken; detailed ocular history was recorded. Personal, family history and medical history along with smoking history in particular was recorded. FFA was done to confirm the diagnosis of AMD. ***Result***: In 200 subjects, Mean age of presentation is 59.52 ± 9.19 years and median are 60.5 years, out of which 120 were males and 80 were females with male: female ratio as 1.50:1. Out of 200 subjects, 60 patients had a history of hypertension and 48 were diabetic. 140 subjects were smokers, 116 patients were illiterate and 108 patients belonged to urban areas**.** ***Conclusion***: The study reported various risk factors of AMD as increasing age, smoking, illiterate population, patients living in urban areas as of the risk factors of AMD.

Keywords: AMD, Risk Factors, Smoking, Hypertension, Diabetes.

Key message: Early Detection Helps in Early Management and Thus Preventing Irreversible Loss of Vision.

INTRODUCTION

Retinal degeneration occurs gradually in age-related macular degeneration. Age-Related Macular Degeneration is one of the primary causes of blindness in those over 50 [1], years of age. In India, the total prevalence of AMD is 1.38% [2]. AMD has a direct impact on quality of life because it impairs face recognition, driving, and reading [3]. Drusen and alterations in the retinal pigment epithelium are evident in AMD on fundus examination. Based on choroidal neovascularization, AMD can be divided into two categories: dry AMD and wet AMD. According to a number of studies, neovascular AMD accounts for 66% of Late AMD patients, 90% of which result in blindness [4]. Dry Age-Related Maculopathy and Wet Age-Related Maculopathy are the two general categories into which AMD can be differentiated.

Dry AMD can be defined on the basis of fundus findings as mentioned below:

- Soft drusen of any size with indistinct margins is more suggestive of AMD than distinct margins.
- Associated area of hyperpigmentation with drusen.
- Drusen associated with areas of hypopigmentation or depigmentation.
- Geographic atrophy.

Late AMD [5], can be classified on the basis of age-related macular degeneration which includes:

- Neovascular AMD.

As the technology advances and with effective treatment methods [6-8], it is important to identify the patients at higher risk who can progress from early AMD to Late AMD, for timely intervention to stop the progression of disease for better visual prognosis. The progression into Late AMD could be assessed on ophthalmoscopic findings such as Drusen and pigmentation irregularities [9]. The main aim of the study asses the various risk factors associated with AMD and to find out the Socio demographic characteristics of the AMD. The precise Risk factors evaluated in this study, could be assessed early in routine history taking which help to assess the risk of progression into Late AMD.

***Corresponding Author:** Dr Ananta Raina
Senior resident, Department of Ophthalmology, GDMC Dehradun.

MATERIALS AND METHODS

The prospective, observational, hospital-based study was conducted in Upgraded department of ophthalmology in GMC, Jammu for the period of one year from June 2021 to May 2022.The study comprised patients above 40 years of age, who attended the Out Patient Department of Ophthalmology This study was performed in accordance with the tenets of the Declaration of Helsinki and was approved by the Institutional Ethics committee. The study comprised 200 patients who were Included in the study, either symptomatic or asymptomatic.

The following patients are included in the study:

- Age ≥ 40 years
- Complaints of diminished vision/Micropsia/Metamorphopsia
- Newly discovered AMD without Treatment

The following patients are excluded from the study:

- Amblyopia
- Retinal dystrophy
- Pathological myopia
- CRVO or CRAO
- Patients suffering from any other inflammatory disorder.

After explaining study to patients, written informed consent was taken from them. Particulars of patients were taken; detailed ocular history was recorded. Personal, Family history and medical history along with smoking history in particular was recorded. Number of pack years a patient was smoking was noted.

Complete ocular and systemic examination were done. Ocular examination included Visual Acuity, detailed anterior segment examination using slit lamp, detailed posterior segment examination using indirect ophthalmoscopy after full dilatation of pupil using eye 0.8% tropicamide and 5% phenylephrine solution. Amsler grid chart was used to detect micropsia, macropsia or and metamorphopsia. After clinical assessment, Fluorescein angiography was done to diagnose AMD. It was done by using 3 ml of 20% fluorescein dye.

The patients in eye OPD selected for the study were thoroughly assessed. Data was collected and entered on Microsoft Excel 2019 sheet and analyzed.

Statistical Incidence

Statistical analysis will be done by using SPSS software for windows version 25. Qualitative data will be depicted as number and percentage whereas quantitative as mean ± standard deviation.

RESULTS

Among the patients attending Out Patient Department in one year of duration, 200 subjects were diagnosed with AMD. Mean age of presentation is 59.52 ± 9.19 years (Figure 1) and median age of data collected is 60.5 years out of which 120 were Males and 80 were females with Male: Female ratio as 1.50:1(Figure 2).

Out of 200 subjects, 140 had no history of hypertension and 48 were diabetic. 140 subjects were smokers, 116 patients were illiterate and 108 patients belong to urban areas (Table 1).

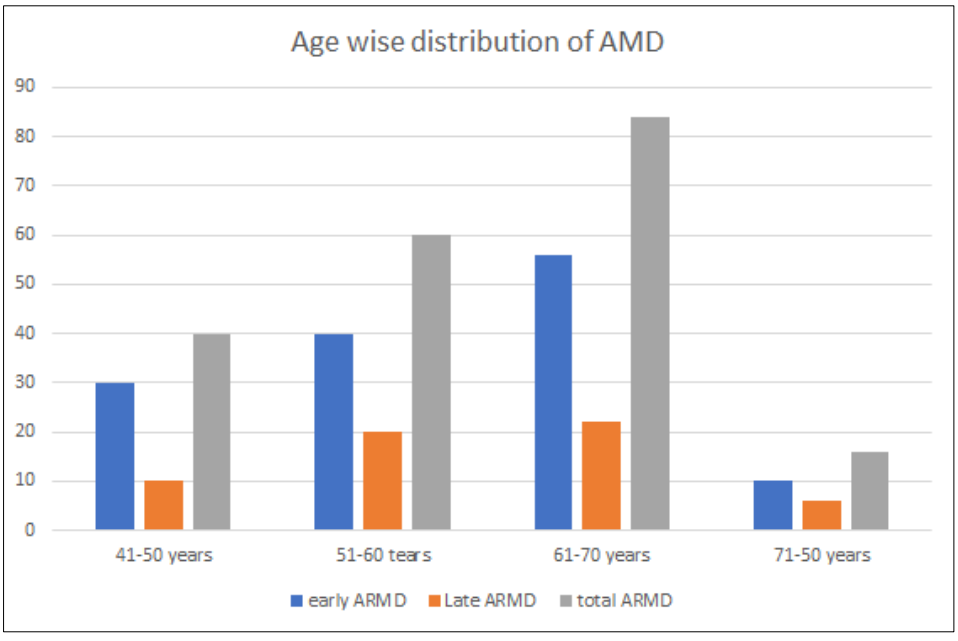

Figure 1: Bar graph representing age wise distribution of AMD as early and late phases

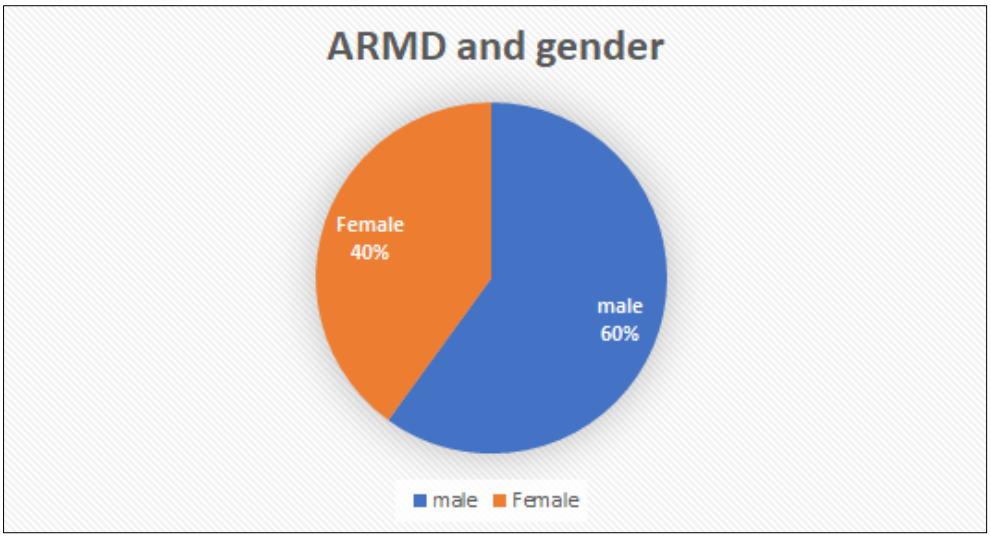

Figure 2: Pie chart depicting male: female ratio

Table 1: Demographic data of study subjects (200)

Characteristics	Early AMD		Late AMD		TOTAL	
	Number	%	Number	%	Number	%
AGE						
41-50 years	30	15	10	5	40	20
51-60 years	40	20	20	10	60	30
61-70 years	54	27	22	15	84	42
71-80 years	10	5	6	3	16	8
GENDER						
Male	60	30	60	30	120	60
Female	60	30	20	10	80	40
HTN						
Present	24	12	36	18	60	30
Absent	80	40	60	30	140	70
DM						
Present	38	19	10	5	18	24
Absent	90	45	62	31	152	76
SMOKING						
Smokers	70	35	70	35	140	70
Non- Smokers	50	25	10	5	60	30
EDUCATION						
Literate	64	32	20	10	84	42
Illiterate	76	38	40	20	116	58
RESIDENCE						
Urban	64	32	44	22	108	54
Rural	52	26	40	20	92	46

DISCUSSION

All the patients were included in present study, who had ophthalmoscopic appearance of AMD, irrespective of age and sex. They were further subdivided into Early and Late AMD subgroups. Detailed history regarding smoking, hypertension, diabetes and educational status was taken.

Li J Q *et al.*, (2020) [10], in their study of meta-analysis on European population concluded that 67 million people are currently affected by any AMD which is expected to show an increasing trend and eventually will rise by 15% till 2050.It was estimated that prevalence of early AMD in 60 years or older is 25.3% and that of late AMD is 2.4%.

Saunier V *et al.*, (2018) [11], in their study of 659 participants found that Incidence rates of early AMD was 79.9 per 1000 person-years and of advanced AMD was18.6 per 1000 person-years. 120 cases of early AMD and 45 cases of late AMD were noted.

In the present study, we found that Early AMD was more common in 61-70 years (28%) of age group, irrespective of sex of the patient. It was also observed

that Late AMD was also more common in this age group (14%). It can be inferred that exposure to other risk factors lead to increased prevalence of AMD in the 61-70 years of age group.

Rudnicka AR *et al.,* (2012) [12], concluded in their study that lowest prevalence rates of AMD taking age and gender into account, but there is higher risk of neovascular AMD in women.

Sasaki M *et al.,* (2017) [13], in their study of 3988 participants it was noted that Early AMD is found in 12.3% of men and 10.3% of women. This suggested different disease process of AMD in different sex.

The present study group comprised of 120 males (60%) and 80 females (40%) in AMD. The male to female ratio came out to be 1.50. It is also found that prevalence of late AMD is more in males (30%) than females (10%). The present study corelates with the previous study carried out by Sasaki M *et al.,* (2017) in which increased prevalence was seen among males.

Velilla S *et al.,* (2013) [14], concluded in their study that cigarette smoking is a modifiable risk factor for both development and progression of AMD. It is also a proven risk factor for both atrophic and neovascular AMD.

Khan JC *et al.,* (2006) [15], in their study of 435 cases with end stage AMD reached to a conclusion that smoking was not a statistically significant factor for AMD. However, they found a strong association between AMD and pack years of smoking. In this study as subjects smoked for 40 pack years and more had increased chances of developing AMD.

Thornton J *et al.,* (2005) [16], conducted a literature review which confirmed a strong association between current smoking and AMD. It was concluded that smoking causes toxic effects on retina.

Present study on subjects of AMD found that 70% subjects were smokers and 30% were non-smokers. In group of smokers, 70 (35%) subjects were present in each subgroup of Early and Late AMD. Therefore, smoking is considered as an important etiological factor in causing AMD in accordance with previous studies.

Cackett P *et al.,* (2008) [17], concluded in their study that lower educational level is associated with higher prevalence of early AMD in Asian population irrespective of age, cigarette smoking and CVS risk factors.

Xu L *et al.,* (2006) [18], on 4439 subjects in Beijing Eye Study found that lower level of education was statistically associated with Early AMD.

Present study consists of 84 subjects (42%) who were literate and 116 (58%) subjects who were illiterate. Compared to previous studies conducted, present study also shows that AMD was more common among illitrates. When subgroups are compared, it was seen that Early AMD was more common in Illitrates (38%) compared to literates (32%) and Late AMD was 10% in literates and 20% in illiterates. It can be explained by the fact that literates are educated and aware of the condition and hence seek early medical advice.

Raman R *et al.,* (2016) [19], in their study identified higher prevalence of early AMD in rural population compared to Urban population and smokeless tobacco as a risk factor for both early and late AMD.

Srinivasan S *et al.,* (2017) [20], in their study of 4971 subjects, the prevalence of AMD was 22.1% in rural and 18.1% in urban population and was statistically significant.

Present study it was observed that 108 patients (54%) resided in urban areas, whereas 92 patients (46%) lived in rural area. But it was contrary to previous studies in which rural population was more than urban population.it can be explained by the reason that rural population consider their visual impairment as normal ageing process, hence delay in seeking medical advice. Whereas urban population is more aware and better medical facilities are available.

Katsi VK *et al.,* (2015) [21], in their study reinforced that AMD is multifactorial disease and suggests essential hypertension is unlikely to be major contributor of AMD.

Xu X *et al.,* (2020) [22], in 1762 subjects estimated increased risk of AMD in patients on antihypertensive treatment and magnitude of association increases with duration of treatment.

In present study conducted on 200 subjects, it was seen hypertension was absent in 70% of cases. So, it can be inferred that elevated blood pressure is not a causative factor of AMD.

He MS *et al.,* (2018) [23], concluded in their study that increased risk of development of AMD is independent of diabetes and retinopathy.

Choi JK *et al.,* (2011) [24], in their study with 88 subjects of AMD and 315 subjects of diabetes mellitus concluded that there is relationship between early AMD and diabetes though underlying process is not determined.

In the present study, no history of diabetes was present in 152 subjects (76%), which corelated well the previous study through which conclusion was made that AMD is independent of Diabetes mellitus.

CONCLUSIONS

From the present study the conclusions drawn were as follows:

- Maximum number of early and late AMD were seen in 61-70 years of age group.
- Prevalence of AMD was more common in males compared to females with male to female ratio of 1.50:1.
- History of hypertension was not significantly associated with as no history was present in 70% of cases.
- History of diabetes was not significant as was absent in 76% of cases.
- History of smoking was present in 70% of subjects.
- Maximum number of subjects were illiterate (58%).
- As per the place of residence it was observed that 54% of patients belong to urban areas compared to 46% from rural areas and was higher in both early and late AMD.

Financial Support and Sponsorship: Nil.

Conflicts of Interests: Nil

Approval: This study was approved by institutional ethical committee.

BIBLIOGRAPHY

1. Kawasaki R, Yasuda M, Song SJ, Chen SJ, Jonas JB, Wang JJ, *et al*. The prevalence of age-related macular degeneration in Asians: a systematic review and meta-analysis. Ophthalmology 2010 May;117(5):921-27.
2. Kulkarni SR, Aghashe SR, Khandekar RB, Deshpande MD. Prevalence and determinants of age-related macular degeneration in the 50 years and older population: a hospital based study in Maharashtra, India. *Indian J Ophthalmol* 2013;61(5):196-01.
3. Taylor DJ, Hobby AE, Binns AM, Crabb DP. How does age-related macular degeneration affect real-world visual ability and quality of life? A systematic review. *BMJ Open* 2016;6(12):e011504.
4. Age-Related Eye Disease Study Research Group. A randomized, placebo-controlled, clinical trial of high-dose supplementation with vitamins C and E, beta carotene, and zinc for age-related macular degeneration and vision loss: AREDS report no. 8 [published correction appears in Arch Ophthalmol. 2008 Sep;126(9):1251]. *Arch Ophthalmol*. 2001;119(10):1417-36.
5. Klein R, Davis MD, Magli YL, Segal P, Klein BE, Hubbard L. The Wisconsin age-related maculopathy grading system. *Ophthalmology* 1991;98(7):1128-34.
6. Brown DM, Kaiser PK, Michels M, Soubrane G, Heier JS, Kim RY, *et al*. ANCHOR Study Group. Ranibizumab versus verteporfin for neovascular age-related macular degeneration. N Engl J Med 2006 Oct 5;355(14):1432-44.
7. Chakravarthy U, Lim JI. New treatments for neovascular acute macular degeneration. BMJ 2007 Feb 10;334(7588):269-70.
8. Wong TY, Liew G, Mitchell P. Clinical update: new treatments for age-related macular degeneration. *Lancet* 2007;370(9583):204-06.
9. Davis MD, Gangnon RE, Lee LY, Hubbard LD, Klein BE, Klein R, *et al*. Age-Related Eye Disease Study Group. The Age-Related Eye Disease Study severity scale for age-related macular degeneration: AREDS Report No. 17. Arch Ophthalmol 2005 Nov;123(11):1484-98.
10. Li JQ, Welchowski T, Schmid M, Mauschitz MM, Holz FG, Finger RP. Prevalence and incidence of age-related macular degeneration in Europe: a systematic review and meta-analysis. Br J Ophthalmol 2020 Aug;104(8):1077-84.
11. Saunier V, Merle BMJ, Delyfer MN, Cougnard-Grégoire A, Rougier MB, *et al*. Incidence of and Risk Factors Associated With Age-Related Macular Degeneration: Four-Year Follow-up From the ALIENOR Study. JAMA Ophthalmol 2018 May 1;136(5):473-81.
12. Rudnicka AR, Jarrar Z, Wormald R, Cook DG, Fletcher A, Owen CG. Age and gender variations in age-related macular degeneration prevalence in populations of European ancestry: a meta-analysis. Ophthalmology 2012 Mar;119(3):571-80.
13. Sasaki M, Harada S, Kawasaki Y, Watanabe M, Ito H, Tanaka H, *et al*. Gender-specific association of early age-related macular degeneration with systemic and genetic factors in a Japanese population. Sci Rep 2018 Jan 15;8(1):785.
14. Velilla S, García-Medina JJ, García-Layana A, Dolz-Marco R, Pons-Vázquez S, Pinazo-Durán MD, *et al*. Smoking and age-related macular degeneration: review and update. J Ophthalmol 2013;2013:895147.
15. Khan JC, Thurlby DA, Shahid H, Clayton DG, Yates JR, Bradley M, *et al*. Genetic Factors in AMD Study. Smoking and age related macular degeneration: the number of pack years of cigarette smoking is a major determinant of risk for both geographic atrophy and choroidal neovascularisation. Br J Ophthalmol 2006 Jan;90(1):75-80.
16. Thornton J, Edwards R, Mitchell P, Harrison RA, Buchan I, Kelly SP. Smoking and age-related macular degeneration: a review of association. Eye (Lond) 2005 Sep;19(9):935-44.
17. Cackett P, Tay WT, Aung T, Wang JJ, Shankar A, Saw SM, *et al.* Education, socio-economic status and age-related macular degeneration in Asians: the Singapore Malay Eye Study. Br J Ophthalmol 2008 Oct;92(10):1312-15.
18. Xu L, Li Y, Zheng Y, Jonas JB. Associated factors for age related maculopathy in the adult population

in China: the Beijing eye study. *Br J Ophthalmol* 2006;90(9):1087-90.
19. Raman R, Pal SS, Ganesan S, Gella L, Vaitheeswaran K, Sharma T. The prevalence and risk factors for age-related macular degeneration in rural-urban India, Sankara Nethralaya Rural-Urban Age-related Macular degeneration study, Report No. 1. Eye (Lond) 2016 May;30(5):688-97.
20. Srinivasan S, Swaminathan G, Kulothungan V, Ganesan S, Sharma T, Raman R. Age-related macular degeneration in a South Indian population, with and without diabetes. Eye (Lond) 2017 Aug;31(8):1176-83.
21. Katsi VK, Marketou ME, Vrachatis DA, Manolis AJ, Nihoyannopoulos P, Tousoulis D, *et al*. Essential hypertension in the pathogenesis of age-related macular degeneration: a review of the current evidence. J Hypertens. 2015 Dec;33(12):2382-88.
22. Xu X, Ritz B, Coleman A, Liew Z, Deapen D, Lee E, *et al*. Hypertension, antihypertensive medications use and risk of age-related macular degeneration in California Teachers Cohort. J Hum Hypertens. 2020 Sep;34(8):568-76.
23. Ming-Shan He, Fang-Ling Chang, Hong-Zin Lin, Jung-Lun Wu, Tsung-Cheng Hsieh, Yuan-Chieh Lee. The Association Between Diabetes and Age-Related Macular Degeneration Among the Elderly in Taiwan. *Diabetes Care* 1 October 2018; 41 (10): 2202–11.
24. Choi JK, Lym YL, Moon JW, Shin HJ, Cho B. Diabetes mellitus and early age-related macular degeneration. Arch Ophthalmol 2011 Feb;129(2):196-99.

Cite This Article: Ananta Raina & Ashok K Sharma (2025). Assessment of Risk Factors in Age Related Macular Degeneration in Tertiary Care Hospital. *East African Scholars J Med Sci, 8*(7), 275-280.