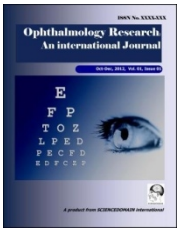

Ophthalmology Research: An International Journal
2(6): 259-267, 2014, Article no. OR.2014.6.001

SCIENCEDOMAIN *international*
www.sciencedomain.org

The Epidemiology and Type of Macular Disease Seen in a Teaching Hospital in South-West, Nigeria

C. O. Adeoti[1*], O. H. Onakpoya[2], O. U. Kolawole[3] and D. S. Agbeleye[3]

[1]Department of Ophthalmology, Faculty of Clinical Sciences, Lautech Osogbo P.O Box 979, Osogbo, Osun State, Nigeria.
[2]Department of Ophthalmology, Obafemi Awolowo University Teaching Hospital, Ile-Ife, Osun State, Nigeria.
[3]Department of Ophthalmology, Ladoke Akintola University of Technology Teaching Hospital, Osogbo, Osun State, Nigeria.

Authors' contributions

Author COA is the principal and corresponding author. She designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. Authors OHO and OUK performed data collection. Author DSA managed the literature search and performed data collection. All authors read and approved the final manuscript.

Original Research Article

Received 23rd December 2013
Accepted 5th May 2014
Published 21st May 2014

ABSTRACT

Aim: To examine the epidemiology and types of macular disease in our environment in order to advocate possible preventive interventions or address current behaviours that fall within established risk factors.
Study Design: A retrospective study.
Place and Duration of Study: The department of Ophthalmology, Ladoke Akintola University of technology (lautech) teaching hospital, Osogbo, Nigeria. June 2011 to May 2012.
Methodology: The charts of patients seen during the study period were reviewed.
Patients with age-related maculopathy were classified into wet and dry. Blindness and low vision were defined according to the world Health Organization definition.
Results: One thousand and eight patients were seen during the study period and out of these, forty two patients (4.17%) were found to have macular disease. Of the 42 patients with macular disease, 29 (69.05%) had age-related macular degeneration (ARMD).

**Corresponding author: E-mail: caroladeoti2001@yahoo.co.uk;*

There were 19 (45.2%) males and 23(54.8%) female patients with their ages ranging between 10 and 80 years and mean of 58.69 years (SD 15.25).
Two (4.76%) were bilaterally blind while 9(21.43%) were blind in only one eye. Ten (23.81%) had low vision.
Conclusion: Macular disease is prevalent in this environment and ARMD is the commonest cause of macular disease. It is therefore necessary to educate the people about the established known risk factors in ARMD causation.

Keywords: Blacks; maculopathy; age-related macular degeneration; blindness; low vision.

1. INTRODUCTION

Macular disease commonly affects elderly people and the commonest of them is referred to as age related macular degeneration (ARMD). ARMD, a multi factorial and polygenic disease; is an important cause of global blindness accounting for about 9% of cases [1]. It is the leading cause of severe visual loss among people older than 65 years in the developed world [2,3]. It affects more than 1.75 million individuals in the United States and owing to the rapid aging of the US population, this number will increase to almost 3 million by 2020 [2]. Its prevalence increases with age, affecting up to 25% of the population aged 75 years and above. The pathogenesis of this disease is not well known. Apart from aging, varying degrees of genetic and environmental factors are also implied. Several risk factors have been implicated in the pathology of ARMD such as nutrition [4-6], smoking [7-9] and alcohol [10].

This progressive late-onset degenerative disease affects central vision, which can impair important activities, such as driving and reading [11].

In developing countries, some studies have shown that it is more prevalent than earlier believed [12]. In developing countries with lower life expectancy, in-availability of necessary technology and manpower, diseases such as cataract, glaucoma, infections, refractive errors are common causes of blindness while in developed countries, owing to rapid aging, availability of adequate technology and manpower to treat other causes of visual impairment, macular degeneration is an important cause of blindness [2,3].

Other conditions such as macular hole, diabetic macular edema, myopic macular degeneration and toxoplasmosis may also be found.

This study is aimed at examining the prevalence and types of macular disease in this environment in order to put up strategies to reduce incidence. There has been no such study in this hospital.

2. MATERIALS AND METHODS

The study was carried out in the department of Ophthalmology, LAUTECH Teaching hospital Osogbo, Osun state, Nigeria. The hospital is a tertiary hospital, located in the capital of the state and serves neighbouring states.

It was a retrospective study that included all consecutive patients with macular disease over a 2 year period (2011-2012).

Information obtained included the age, sex, visual acuity, ocular co-morbidities, systemic co-morbidities and type of macular disease.

The records staff recorded the age and sex of all patients. Ophthalmic Nurses determined the visual acuities, blood pressure and urinalysis, consultant Ophthalmologists performed the ocular and systemic examinations. However, occasionally, ophthalmology residents performed systemic examinations. Amsler grid chart and ophthalmoscopy were used in assessing the macula area. Ophthalmoscopy was done using ophthalmoscopes (direct and indirect) and Slit lamp bio microscope with non contact lenses (78D and 90D). Fundus photograph and fluorescein angiography were not done as these facilities were not available during the study period. Patients with ARMD who had neovascularization, oedema or serous retinal detachment were classified as having wet maculopathy while those with only drusen or atrophy were classified as dry. The diagnosis of high myopic macular degeneration was based on history and clinical examination including refraction. Toxoplasmosis was diagnosed based on clinical appearance of fresh lesions, old scars and trial of therapy. Diabetic maculopathy was diagnosed based on history, clinical examination and laboratory findings.

Blindness implies a presenting visual acuity worse than 3/60 in the better eye with best correction. Low vision was defined as visual acuity less than 6/18 and equal to or better than 3/60 in the better eye with best correction.

This methodology was carried out according to the guidelines of the Declaration of Helsinki and Institutional ethical approval was obtained.

Excluded were cases seen outside the study period and those with unspecified diagnosis.

3. RESULTS

A total of 1008 new patients were seen during the study period. Out of these, forty two patients (4.17%) were found to have macular disease. Out of the 42 patients with macular disease, 29 (69.05%) had ARMD. Of the 1008 new patients, 2.88% had ARMD.

There were 19 (45.2%) males and 23(54.8%) females with their ages ranging between 10 and 80 years and mean of 58.69 years (SD 15.25) as shown in Table 1. The patients with ARMD were aged 59 years and above.

Table 2 shows the visual acuities of the 42 patients. Two (4.76%) were bilaterally blind while 9(21.43%) were blind in only one eye. Ten (23.81%) had low vision.

Fig. 1 shows the type of maculopathy seen. Twenty six (61.91%), 3(7.14%) and 13(30.95%) had dry ARMD, wet ARMD and other types of maculopathy respectively. The other types of maculopathy included toxoplasmosis 3(7.14%), diabetic maculopathy 5(11.91%), myopic macular scar 2(4.76%), macular hole 2(4.76%) and traumatic scar 1(2.38%).

The types of ocular co-morbidity are as shown in Fig. 2. Some patients had more than one problem while Fig. 3 shows associated systemic morbidities.

Table 1. Age-sex distribution of 42 patients

Age group	Sex		Total
	M	F	
10-19	0	2	2
20-29	1	0	1
30-39	0	1	1
40-49	1	2	3
50-59	6	4	10
60-69	5	7	12
70and above	6	7	13
Total	19	23	42

Table 2. Visual acuity of 42 patients

Visual acuity	Right	Left
6/4-6/6	4	3
6/9-6/18	18	15
6/24-3/60	11	20
Poorer than 3/60	9	4
Total	42	42

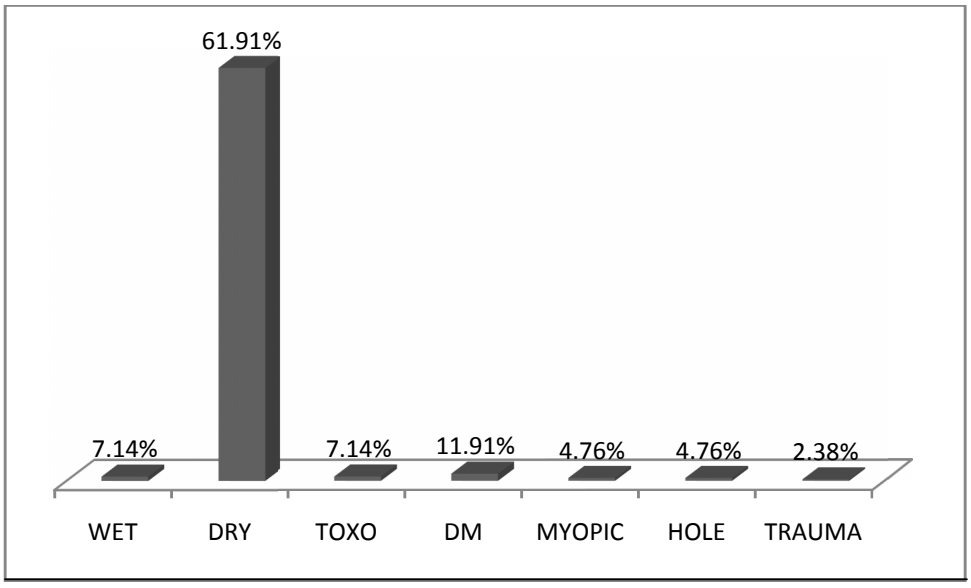

Fig. 1. Bar chart of type of maculopathy

ARMD: Dry 61.91% and Wet 7.14%; The other scars included toxoplasmosis 3(7.14%), diabetic maculopathy (DM) 5(11.91%), myopic macular scar 2(4.76%), macular hole 2(4.76%) and traumatic scar 1(2.38%)

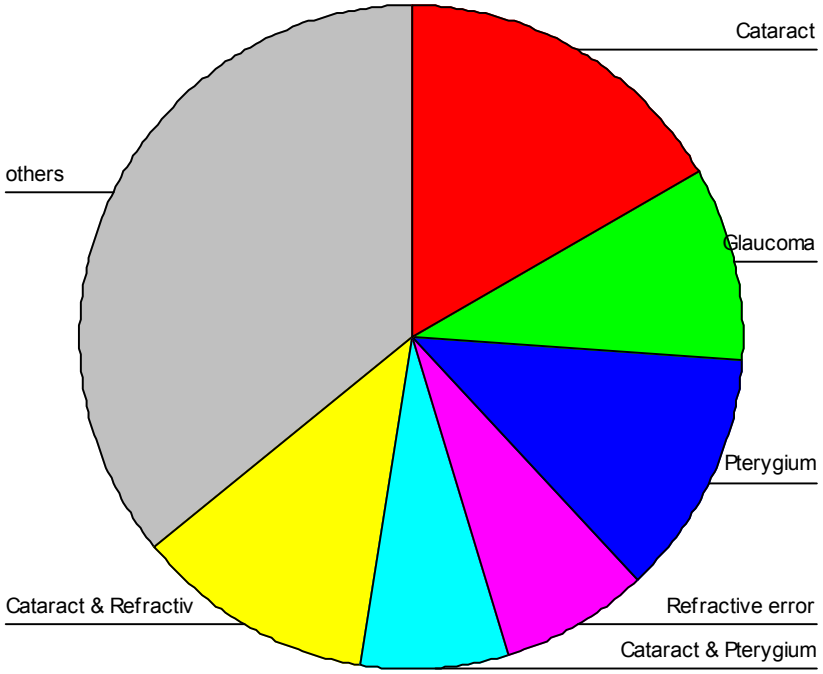

Fig. 2. Pie chart of ocular co-morbidities

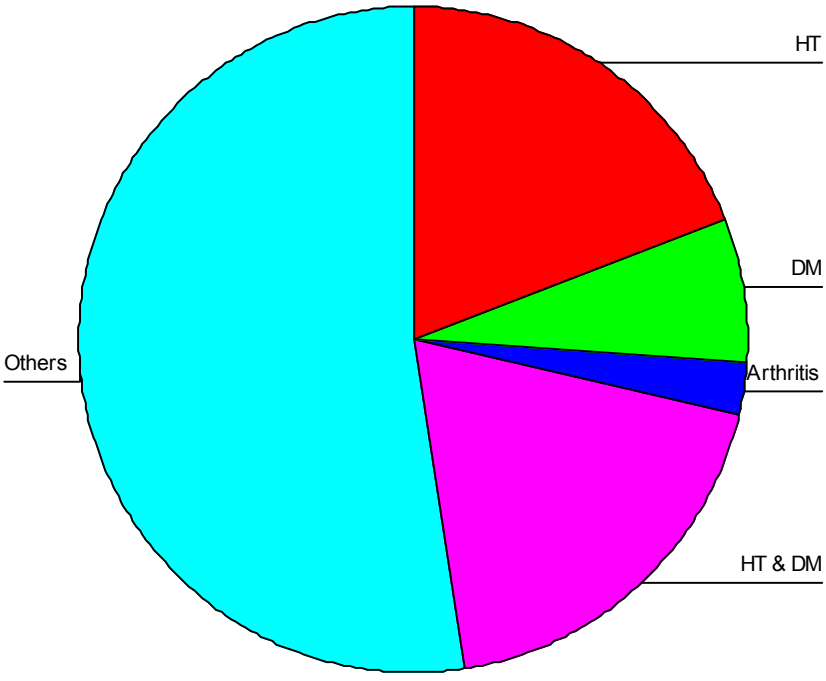

Fig. 3. Pie chart of systemic co-morbidity

HT means hypertension, DM means Diabetic Mellitus;Arthritis means inflammatory joint disease

4. DISCUSSION

Macular disease is a frequent cause of visual impairment [13,14] in older people. In young patients, high myopia and toxoplasmosis were amongst causes of macular disease. ARMD is the most important cause of visual impairment in the United Kingdom [15].

Approximately 200,000 people aged 75 years and above are visually impaired due to ARMD in the United Kingdom [15]. As a result of aging of the population and advances in technology with its antecedent socio economic development, there is now an epidemic of age-related macular degeneration in developed countries.

In developing countries, some studies have shown that ARMD is more prevalent than earlier believed [12].

In our study, 2.88% of all patients seen and 29 (69.05%) of those with maculopathy had ARMD and they were aged 59years and above. In a study by Owen et al, overall prevalence of late ARMD was 2.4% (95% confidence interval (CI) 1.7% to 3.3%) [16]. This is similar to what was found in our study.

Our finding is lower than what was obtained in an Oklahoma Indian population with a prevalence of 35.2% [17]. However, this is a population-based study while our study is hospital based. There is therefore, a need for more widespread population studies to determine the status in our country.

It has been established that Macular carotenoids such as lutein and zeaxantin are strong antioxidants which act as filters to blue light and also neutralize light-generated free radicals. These carotenoids decrease in concentration in the macula with age which may lead to increased incidence of ARMD with age resulting from harmful effect of blue light. There may be need to health educate the people on the need to take supplements of these carotenoids in their diet [4].

Also, various authors have examined the association between smoking, its cessation and the incidence of age-related maculopathy and found that current smoking nearly triples AMD incidence, while smoking cessation lowers AMD incidence in a non-linear fashion even in the elderly [8,18].

In a systematic review and meta-analysis of clinical risk factors for age-related macular degeneration, it was found that Smoking, previous cataract surgery and a family history of ARMD are consistent risk factors for ARMD [19].

Heavy alcohol consumption (more than three standard drinks or 20g per day has also been associated with an increased risk of early ARMD [20,22]. Although this association seems to be independent of smoking, residual confounding effects from smoking cannot be excluded completely [10].

Toxoplasmosis is one of the most frequently identifiable causes of uveitis worldwide and this can involve the macula [23]. In this study, 3 patients were diagnosed to have toxoplasmosis. Improved environmental and personal hygiene may reduce the occurrence of this disease.

Diabetes may present with diabetic maculopathy with exudates and oedema. Five patients had Diabetic maculopathy but this may not represent the total number of patients with this

problem. In our hospital, patients are not routinely referred to Ophthalmologists and physicians may not routinely do fundus examination. It may be necessary to influence the physicians to do fundus examination for all patients or they can send all patients to the eye clinic for screening. Also, control of Diabetes cannot be overemphasized.

Pathologic myopia, or high myopia, is also an important cause of secondary choroidal neovascularization (CNV) in young people and a major cause of legal blindness in many developed countries. In high myopia, macular CNV is the most common vision-threatening complication [24]. Two (4.76%) out of the 42 patients with maculopathy had myopic macular scar in this study.

5. CONCLUSION

Macular disease is an important cause of visual impairment and ARMD is the commonest type as 29 (69.05%) out of 42 patients with macular disease had ARMD. There is therefore need for health education of the people especially the aged and those that have family history of ARMD to avoid established risk factors such as smoking, its vapour and alcohol and take recommended dietary supplements.

CONSENT

Not applicable. It was a retrospective study.

ETHICAL APPROVAL

Institutional ethical approval was obtained.

ACKNOWLEDGEMENTS

We appreciate the assistance of the record officers of the hospital who assisted in tracing the casenotes of the patients and Mrs. I. A. Adetoro for data entry.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Yorston D. What's new in age-related macular degeneration? Community eye health. 2006;19(57):4-5.
2. Friedman DS, O' Colmain BJ, Muñoz B, Tomany SC, McCarty C, de Jong PT, et al. Eye Diseases Prevalence Research Group. Prevalence of age-related macular degeneration in the United States. Arch Ophthalmol. 2004;122(4):564-572.
3. VanNewkirk MR, Nanjan MB, Wang JJ, Mitchell P, Taylor HR, McCarty CA. The prevalence of age-related maculopathy: The visual impairment project. Ophthalmology. 2000;107(8):1593-1600.
4. Szostak WB, Szostak-Wegierek D. Nutrition in prevention of age-related macular degeneration. Przegl Lek. 2008;65(6):308-11.

5. Elaine WT Chong, Luibov D Robman, Julie A. Simpson, Allison M. Hodge, Khin Zaw Aung, Theresa K. Dolphin, et al. Fat Consumption and its association with age-related macular degeneration . Arch Ophthalmol. 2009;127(5):674-680.
6. Chong EW, Kreis AJ, Wong TY, Simpson JA, Guymer RH. Dietary omega-3 fatty acid and fish intake in the primary prevention of age-related macular degeneration: A systematic review and meta-analysis. Arch Ophthalmol. 2008;126(6):826-833.
7. Levai L, Horge I, Genoveva O, Cristina G, Bran L, Monica G. Epidemiological factors in age related macular degeneration. Oftalmologia. 2008;52(2):44-5.
8. Neuner B, Wellmann J, Dasch B, Behrens T, Claes B, Dietzel M, et al. Modeling smoking history: A comparison of different approaches in the MARS study on age-related maculopathy. Ann Epidemiol. 2007;17(8):615-21.
9. Leveziel N, Delcourt C, Zerbib J, Dollfus H, Kaplan J, Benlian P, et al. Epidemiology of age related macular degeneration. J. Fr. Ophtalmol. 2009;32(6):440-5.
10. Chong EW, Kreis AJ, Wong TY, Simpson JA, Guymer RH. Alcohol consumption and the risk of age-related macular degeneration: a systematic review and meta-analysis. Am J Ophthalmol. 2008;145(4):707-715.
11. Nwosu SN. Prevalence and pattern of retinal diseases at the Guiness eye hospital, Onitsha, Nigeria. Ophthalmic epidemiol. 2000;7:41-8.
12. Krishnaiah S, Das T, Nirmalan PK, Nutheti R, Shamanna BR, Rao GN, et al. Risk factors for age-related macular degeneration: Findings from the Andhra Pradesh Eye disease study in South India. Invest. Ophthalmol Vis. Sci. 2005;46:4442-9.
13. Pelletier AL, Thomas J, Shaw FR. Vision loss in older persons. Am Fam Physician. 2009; 79(11):963-70.
14. Kawasaki R[1], 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;117:921-7.
15. Owen CG, Fletcher AE, Donoghue M, Rudnicka AR. How big is the burden of visual loss caused by age-related macular degeneration in the United Kingdom? Br. J. Ophthalmol. 2003;87:312-317.
16. Owen CG, Jarrar Z, Wormald R, Cook DG, Fletcher AE, Rudnicka AR. The estimated prevalence and incidence of late stage age related macular degeneration in the UK. Br. J. Ophthalmol. 2012;96(5):752-756.
17. Butt AL, Lee ET, Klein R, Russell D, Ogola G, Warn A, et al. Prevalence and risks factors of age-related macular degeneration in Oklahoma Indians: The vision keepers study. Ophthalmology. 2011;118(7):1380-5.
18. Chakravarthy U, Augood C, Bentham GC, de Jong PT, Rahu M, Seland J, et al. Cigarette smoking and age-related macular degeneration in the EUREYE Study. Ophthalmology. 2007;114(6):1157-63.
19. Chakravarthy U, Wong TY, Fletcher A, Piault E, Evans C, Zlateva G, et al. Clinical risk factors for age-related macular degeneration: A systematic review and meta-analysis. BMC Ophthalmol. 2010;10:31.
20. La Torre G, Pacella E, Saulle R, Giraldi G, Pacella F, Lenzi T, et al. The synergistic effect of exposure to alcohol, tobacco smoke and other risk factors for age-related macular degeneration. Eur J. Epidemiol. 2013;28(5):445-6.
21. Tian J, Fang K, Qin XY, Chen Q, Li J, Yu WZ, et al. Case-control study of risk factors in age-related macular degeneration. Beijing Da Xue Xue Bao. 2012;44(4):588-93.
22. Adams MK, Chong EW, Williamson E, Aung KZ, Makeyeva GA, Giles GG, et al. 20/20--Alcohol and age-related macular degeneration: The Melbourne Collaborative Cohort Study. Am J Epidemiol. 2012;176(4):289-98.

23. Perkins ES. Ocular toxoplasmosis. Br J Ophthalmol. 1973;57(1):1-17.
24. Alfredo Pece, Vincenzo Isola, Lucia Vitale. Management of Choroidal Neovascularization in Myopic Macular Degeneration. Expert Rev Ophthalmol. 2008;3(3):311-323.

Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sciencedomain.org/review-history.php?iid=523&id=23&aid=4627