Case Report

VISUAL DISORDERS IN ALZHEIMER'S DISEASE: REPORT OF A CASE IN A NIGERIAN AND LITERATURE REVIEW

1Omoti AE, 2Ese-Onakewhor JN.

1Professor, 2Lecturer, Department of Ophthalmology, School of Medicine, University of Benin, Benin City, Edo State.

ABSTRACT

Aim: To present a case of Alzheimer’s disease with poor vision which were not due to the ocular pathology.

Case report: A 74 years old male surgeon presented with a one year history of progressive, painless visual loss of one year duration and was found to have visually insignificant cataract, normal optic discs and mild pigmentary changes in the macular region. He was a known case of Alzheimer’s disease. Further evaluation revealed difficulties with comprehension, inability to recognize even members of his immediate family, his children and occasionally, his wife. He is unable to move around unaided and frequently bumps into objects. He frequently accuses people in the television of being intruders in his house. He is also frequently disoriented with difficulty describing what he had seen, difficulty reaching out to objects which he frequently knocks over. He experiences difficulties climbing and descending from stairs.

Conclusion: Elderly patients with dementia may present with poor vision not due to their ocular pathology but due to the neurological disorder. An index of suspicion is required to avoid needless surgery or other treatment.

Keywords: Alzheimer’s disease, visual fields restriction, cataract, clumsiness, poor comprehension and recognition.

INTRODUCTION

Alzheimer’s disease is an age-related neurodegeneration of the CNS which is characterized by neuronal and synaptic loss in the cerebral cortex, it is progressive and develops slowly and gradually worsens over a period of several years.1,2 It results in cognitive deficit and dementia which affects memory, thinking, language, problem-solving and it also causes personality and gait changes as the disease progresses.3,4,5 The symptoms experienced by patients are usually not uniform and the disease progression rate differs with different individuals.6 The physiopathology of Alzheimer disease remains unknown and it is the most common cause of dementia in the elderly.7,8 The prevalence of Alzheimer’s disease ranges between 1.9 to 5.8 cases per 100 population aged
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65 and over. The brain and retina being an offshoot of the brain, are affected in several neurodegenerative diseases, including Alzheimer’s disease (AD), Parkinson’s disease (PD), and glaucoma. A possible relationship between glaucoma and neurodegenerative diseases such as Alzheimer Disease has been suggested by Mancino et al. Clinically diagnosed Alzheimer’s disease is a common condition with significant public health impact which will continue to increase with increasing longevity of the population, with an incidence of up to 47.2% in persons over 85 years. Moreover, its prevalence is likely to increase in the next few years as a consequence of current demographic trends. The prevalence ratio for Alzheimer’s disease increases steeply with age. A range of ocular manifestations of Alzheimer’s disease, including retinal and lens amyloid-beta accumulation, retinal nerve fiber layer loss, and retinal vascular changes, have been proposed as potential biomarkers of the disease. It is therefore important to note the ocular changes associated with Alzheimer’s disease and relate them with the patient symptoms, to determine what therapy is required.

CASE REPORT

The case of a 74 years old male surgeon who presented to the eye clinic of the University of Benin Teaching Hospital with a one year history of progressive, painless visual loss is presented. He was diagnosed with Alzheimer’s disease in a hospital in London, United Kingdom, three years prior to presentation, when he started experiencing memory loss. He was also told that he had cataract at the same time and same hospital, but that it was in its very early stages. He is not a known diabetic or hypertensive patient. He has no history of any other systemic disease. Currently, his memory loss has become severe and needs the assistance of caregivers. He is unable to recognise even members of his immediate family, his children and occasionally, his wife. He is unable to move around unaided and frequently bumps into objects. He does not experience hallucinations but there are complaints of his accusing people in the television of being intruders in his house. He is frequently disoriented with difficulty describing what he had seen, difficulty reaching out to objects which he frequently knocks over. He experiences difficulties climbing up the stairs and tries to climb more than two at a time. The difficulties are even worse coming down the stairs.

Examination revealed an elderly otherwise healthy looking adult male. His visual acuity in both eyes was recorded as hand movement, which was not improved with pinhole. His ocular adnexal structures were normal, conjunctiva was white, cornea was clear except for the arcus senilis, anterior chamber deep and the pupils were round, central and reacted to light and accommodation. There were early lens opacities in both eyes and slit lamp examination showed that there were grade1 posterior subcapsular opacities, a little worse in the left eye. Fundoscopy revealed easily visualised pink healthy looking optic discs with distinct margins and a cup to disc ratio of 0.1 in both eyes. His intraocular pressures measured with the Pulsair non-contact tonometer were 8mmHg in the right eye and 10mmHg in the left eye. He subsequently had dilated fundoscopy which did not reveal any significant fundal pathology apart from mild pigmentary changes in the macular region.

DISCUSSION

The index patient presented with gradual progressive painless visual loss. The initial
considerations, considering his age were cataract, glaucoma and age related macular degeneration or a combination of any of these.\textsuperscript{15,16} Refractive errors were ruled out since there was no improvement of visual acuity with pinhole.\textsuperscript{17} A diagnosis of cataract was supported by his presenting complaints and a past diagnosis of cataract three years earlier. However, fundoscopy and slit lamp biomicroscope examination showed that the amount of opacities could not have significantly affected his vision to this level, Bei L et al in 2015 reported that cataract presence or maturity does not signify the presence or absence of Alzheimer’s disease.\textsuperscript{18} Glaucoma was also supported by his age and presenting complaint in addition to features suggestive of visual field constriction such as bumping into objects, clumsiness when reaching out to objects, difficulty climbing up or descending from stairs.\textsuperscript{14,15} It was however ruled out by the normal optic disc and low intraocular pressures though a possible relationship between glaucoma and neurodegenerative diseases such as Alzheimer Disease has been suggested by Mancino et al.\textsuperscript{11} His difficulties with comprehension limited further tests such as visual fields analysis as Alzheimers disease usually results in cognitive deficit and dementia which affects memory, thinking, language, problem-solving and it also causes personality and gait changes as the disease progresses.\textsuperscript{3,4} The normal optic discs and reactive pupils also ruled out other forms of optic neuropathies which were possibilities. Age related macular degeneration was also a consideration due to his age and presenting complaint.\textsuperscript{14} However, fundoscopy did not reveal other features suggestive if macular degeneration such as drusen, geographical atrophy or a subretinal neovascular membrane or features suggestive of dry or wet maculopathy.

This led us to believe that the problem may not be from the mild ocular pathologies seen. Rather, the Alzheimer’s disease may be responsible for the visual and perceptive complaints that the patient had.\textsuperscript{4,19} This led to further elucidation of the additional ocular symptoms experienced by this patient.\textsuperscript{20} The realisation that the features were due to Alzheimer’s disease saved the patient from needless cataract surgery or other treatments which would not have resulted in any improvement in vision for this patient. Alzheimer disease represents one of the greatest medical challenges of this century and the condition is becoming increasingly prevalent worldwide and no effective treatments have been developed for this terminal disease. Regardless of the severity of changes seen in the brain in Alzheimer’s disease such as extracellular accumulation of Aβ peptide and intracellular aggregation of hyperphosphorylated tau, there are no similar changes in the globe. Bei et al in 2015 reported that cataract grade or lens opacity is unlikely to provide a non-invasive measure of the risk of developing Alzheimer dementia.\textsuperscript{8} Older age at baseline was associated with a slower rate of decline in the Alzheimer’s disease.\textsuperscript{21} A study carried out in 2018 suggested that cognitively healthy individuals with preclinical Alzheimer’s disease have retinal microvascular abnormalities in addition to architectural alterations and that these changes occur at earlier stages of Alzheimer’s disease than has previously been demonstrated.\textsuperscript{22} Retinal and lens amyloid-beta accumulation, retinal nerve fiber layer loss, and retinal vascular changes, have been proposed by Van et al in 2017 as potential biomarkers of the early detection of the disease.\textsuperscript{14} It is currently advocated that the knowledge of the modifiable risk factors and the implementation of biomarkers will be crucial in the primary prevention of the disease and presymptomatic detection.\textsuperscript{12,23}
Residential care for patients with Alzheimer’s disease is more cost effective and comfortable where they will be surrounded by familiar faces and loved ones.24

CONCLUSION

Alzheimer’s disease is an age related neurodegenerative disease that affects the brain and the eye, with increasing incidence as age increases and it is present in our environment. Knowing the diagnosis of Alzheimer’s disease and realizing its ability to cause poor vision in a patient will reduce the amount of scarce resources needlessly spent on expensive investigations, and avoid needless surgical, medical or laser therapy.

REFERENCES


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