Original Article

Retinal Disorders in a Tertiary Eye Centre in Nigeria

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Purpose: To review the types of retinal disorders in patients seen at the retinal clinic of a tertiary eye centre in southwestern Nigeria.

Study Design: Observational descriptive study.

Place and Duration of Study: Ekiti State University Teaching Hospital, Nigeria over a 2½ year period from July 2013 to January 2016 was reviewed.

Materials and Methods: All patients seen in the clinic had documentation of their demographic characteristics, visual acuity at presentation, findings on dilated fundus examination, slit lamp biomicroscopy and diagnosis. Investigations such as Fundus Fluorescein Angiography (FFA) and ocular coherence tomography (OCT) were recorded.

Results: A total of 405 patients constituting 10.4% of the total patient load had retinal disorders during the period of study. The mean age was 56.95 ± 20.8 years. More than half (68.5%) of the patients were aged 50 years and above. The presenting visual acuity was < 3/60 in 135 (33.3%) of cases. Age related Macular Degeneration was the leading eye disorder seen in 18.2% followed closely by Diabetic retinopathy in 16.3%. Retinitis pigmentosa was the leading cause of bilateral blindness. Optical Coherence Tomography (67.4%) and Fundus Fluorescein Angiography (61.73%) were the leading investigations ordered in the retinal clinic.

Conclusion: Age related macular degeneration and diabetic retinopathy were the leading eye disorders in our centre. Limited access to Investigative facilities is a major challenge in the management of retinal disorders in our centre.

Keywords: Retinal disorders, tertiary eye, retinal investigations.

Diseases affecting the retina vary in types and frequencies depending on the geographic location. The causes include congenital and developmental disorders, inflammations, vascular, age related degenerative conditions, heredity and other disorders due to effect of systemic diseases like diabetes mellitus, hypertension, sickle cell disease among others. The impact on quality of vision vary in magnitude depending on the type and severity of the condition. Retinal disorders account for 13% of eye disorders according to report in a neighbouring state by Onakpoya et al[1]. Nwosu in a study in South eastern Nigeria reported an incidence of 8.1%[2]. The equipments required for evaluation, diagnosis and treatment of retinal disorders are expensive to procure and maintain[3]. Data on the types of retinal disorders in our eye – care facility will assist in planning for a more efficient eye – care delivery for our patients with retinal disorders. A review like this has not been done in our state. Our centre is the only centre with an established retinal care delivery in the state. Most of the incidence reports in our country were done over a decade ago in some other states of the country.

MATERIALS AND METHODS

Ekiti State University Teaching Hospital has an established tertiary eye care service with a retina

subspecialty clinic where all patients with retinal diseases are seen on a scheduled weekday clinic. These patients are either referred from our General Ophthalmology Clinic or other Ophthalmologists from eye care centres in the neighbouring states. The retinal clinic also offer diabetic retinopathy screening service to all the diabetics sent in routinely from the Endocrinology unit of our hospital. Only diabetics with retinal disorders were included in the record of the retinal clinic where records of all patients with retinal diseases were kept from the inception of the clinic. The retinal subspecialty unit offers medical retinal services including Intravitreal injections and lasers while patients requiring vitreoretinal surgical interventions are referred to other centres where vitreoretinal surgical services are provided. Approval was obtained from the ethics and research committee of our centre. The record kept over a 2½ year period from July 2013 to January 2016 was reviewed. Data obtained include Demographic characteristics, visual acuity at presentation, and final diagnosis after detailed dilated ocular examination with binocular indirect ophthalmoscope and slit lamp biomicroscopy with +78D or +90D lenses. Visual acuity was graded according to WHO guideline with ≥ 6/18 as normal, < 6/18 to > 3/60 as visual impairment and < 3/60 to no light perception as blindness. In patients with bilateral disorders the visual acuity of the worse hit eye was considered as the visual acuity of the affected eye. Patients uptake of required investigations and treatment offered were also assessed. Data was analysed using Statistical Package for Social Sciences 20.0 (SPSS Inc., Chicago, IL). Means (Standard deviations) were used to describe the distributions of continuous variables. Categorical variables were described in Percentages. Comparisons of categorical data was performed with the use of Pearson's chi-square test and statistical significance was inferred at $P < 0.05$.

RESULTS

A total of 405 new patients were diagnosed with one form of retinal disorder or the other. This constitutes 10.4% of 3881 total patients seen in the eye clinic over the study period. The mean age was 56.95 ± 20.80 years. The age range was 5 – 120 years. There were 180 (44.4%) males and 225 (55.6%) females giving a male to female ratio of 1:1.3. One hundred and ninety one cases (47.2%) had unilateral eye disorder while 214 (52.8%) had bilateral retinal disorders.

Two hundred and seventy six (68.15%) of the patients were aged above 50 years with greater proportion of females in this age group (Chi square 8.471, P = 0.003 RR = 1.876 (95% CI: 1.225 – 2.873) ([Figure 1].

From Table 1 above the presenting visual acuity in the affected eye was < 3/60 in 135 (33.3%) of the patients, 104 (25.67%) had unilateral blindness while

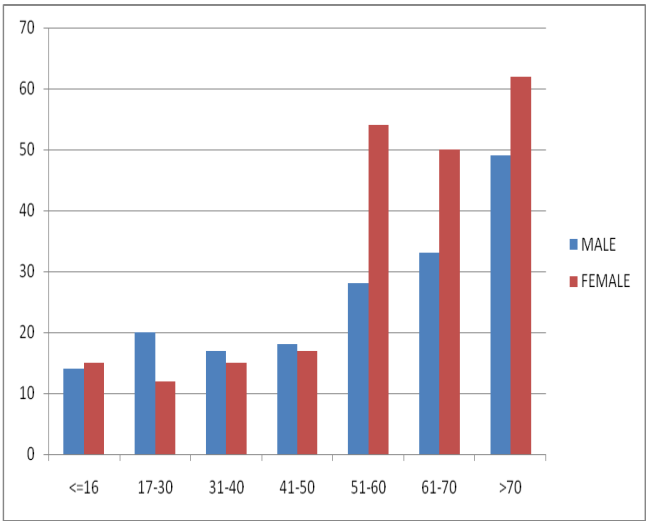

Figure 1: Age – Sex Distribution of Patients.

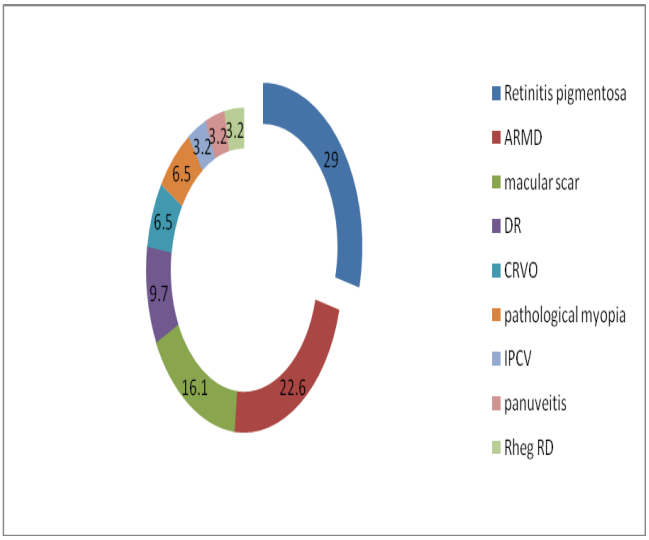

Figure 2: Causes of Bilateral Blindness.

Keys: ARMD: (Age related macular degeneration), **DR:** (Diabetic retinopathy), **CRVO:** (Central retinal vein occlusion), **IPCV:** (Idiopathic polypoidal choroidal vasculopathy), Rheg **RD:** Rhegmatogenous retinal detachment.

Table 1: Laterality Vs Presenting Visual Acuity in the Affected Eye.

	6/6 – 6/18	< 6/18 – 6/60	< 6/60 – 3/60	< 3/60
Unilateral	40	49	25	77
Bilateral	70	55	31	58
Total	110	104	56	135

Chi sq=10.573 P=0.014

Table 2: Uptake of Requested Retinal Investigations.

Retinal Investigations	Requested n (% Total)	Done n (% Requested)
OCT	273 (67.41)	21 (7.7)
FFA	250 (61.73)	2 (0.8)
ERG	72 (17.78)	0 (0)
ICG	28 (6.91)	0 (0)

Table 3: Types of Retinal Diseases.

	Number (%)
Age related Macular Degeneration (AMD)	73 (18.02)
Diabetic Retinopathy	66 (16.3)
Retinal Vein Occlusion	40 (9.9)
Chorioretinitis (Toxoplasma)	37 (9.1)
Retinitis Pigmentosa	24 (5.9)
Retinal Detachment	21 (5.2)
Pathological Myopia	17 (4.2)
Full Thickness Macular Hole	17 (4.2)
Posterior vitreous Detachment	16 (3.95)
Macular Scar	12 (2.96)
Parafoveal Telangiectasia	9 (2.2)
Idiopathic Parafoveal Choroidal Vasculopathy (IPCV)	8 (1.98)
Macular dystrophy	6 (1.5)
Cellophane Maculopathy	6 (1.5)
Neovascular Glaucoma	6 (1.5)
Traumatic Vitreous Hemorrhage	6 (1.5)
Central Serous Chorioretinopathy	3 (0.74)
Hypertensive retinopathy (Grade 4)	4 (0.99)
Intermediate Uveitis	2 (0.49)
Familial Exudative Vitreoretinopathy	1 (0.25)
Angioid streaks	1 (0.25)
Sickle cell Retinopathy	3 (0.74)
Sub Hyaloid Hemorrhage	4 (0.99)
Central retinal artery Occlusion	2 (0.49)
Cystoid Macula Edema	2 (0.49)
Retinal Arterial Macroaneurysm	4 (0.99)
Coloboma	1 (0.25)
Morning Glory Anomaly	1 (0.25)
Myelinated Retinal fibres	2 (0.49)
Arteritic Ischemic Optic Neuropathy	3 (0.74)
Optic Nerve Head Avulsion	1 (0.25)
Optic Neuritis	1 (0.25)

31 (7.65%) had bilateral blindness. Unilateral disorders accounted for 77 (57.04%) of blind eyes and 74 (46.25%) of mild – moderate visual impairment. Visual acuity was found to be normal in 110 (27.16%) of the patients. The rate ratio of blindness in the unilateral to bilateral disorders was 1.817 (CI: 1.196 – 2.758) P = 0.003.

Table 4: Treatment Offered.

Medical (oral and/or topical Drugs)	117 (28.9)
Optical Low Vision Aids	104 (25.68)
Intravitreal AntiVEGF	52 (12.84)
Reassurance	49 (12.1)
Laser	48 (11.85)
Vitreoretinal Surgical Intervention	42 (10.4)

Of the patients with bilateral blindness, Retinitis Pigmentosa accounted for 9 (29.0%) followed by ARMD 7 (22.6%) and macular scar presumably due to toxoplasmosis in 6 (19.4%). Others were Diabetic retinopathy 3 (9.7%), Central retinal vein occlusion and pathological myopia 2 (6.5%) each, IPCV and Retinal detachment 1 (3.2%) each. The causes of unilateral blindness were retinal vascular occlusion 23 (29.9%), Rhegmatogenous RD 14 (18.2%), chorioretinitis 5 (6.5%), Full thickness macular hole 4 (5.2%) and traumatic vitreous hemorrhage 3 (3.9%).

The investigations required are as shown in Table 2 with Optical Coherence Tomography (67.41%) and Fundus Fluorescein Angiography (61.73%) being the 2 leading investigations ordered and Indocyanine green angiography the least ordered. Only 7.7% of our patients were able to do the OCT**.**

Table 3 shows the types of retinal diseases seen. The leading eye disorder was AMD (18.02%) followed closely by Diabetic retinopathy (16.3%). Retinal vein occlusion accounted for 9.9% of the disorders followed closely by Retinitis Pigmentosa.

Systemic and/or Topical drugs were the treatment offered in 117(28.9%) of cases. Some patients utilized more than one treatment options.

DISSCUSSION

There were a total of 405 patients constituting 10.4% of the 3881 outpatient population of our eye care centre within the period of study. This implies that on the average one out of every 10 patients seen in our eye centre had some form of retinal disorder. Other studies have reported retinal disorders constituting 3.9% – 13% of the eye disorders in some other centres in Nigeria[1-5]. We can therefore say that retinal diseases are not as uncommon as they had been perceived to be[6]. A female preponderance was observed in our study contrary to other studies where male preponderance[2,3] and equal proportion of male to female[4] have been reported. A statistically significant pronouncement of the female preponderance after age of 50 years was observed (chi square 8.471, p value 0.003, RR 1.876 CI: 1.225 – 2.873), the reason for which is not obvious from the study but a possibility of the diseases observed occurring more commonly among females cannot be completely ruled out. Lewallen et al opined a greater likelihood of women to seek eye care than men[7]. About 68% of our patients were aged 50 years and above with a mean age of about 57 ± 20.8 years and a mode of 60 years. Despite a mean age higher than reported by others in different parts of the country, we all have a common mode[1-5,6]. The observed mean age was however lower (40 years) in the studies by Onakpoya[1] and Eze[4].

About 1/3 of our patients were blind in the affected eye at presentation. Another 1/3 had visual impairment. This lends credence to the report of retina diseases having a huge contribution to blindness and visual impairment in Nigeria[2,3]. The rate ratio of blindness in the unilateral to bilateral disorders was 1.817 (CI – 1.196 – 2.758) P = 0.003. The increased rate of blindness among unilateral disorders may be explained by possibility of a late detection due to compensatory effect of the other seeing eye.

Age related macular degeneration (ARMD) was the leading disorder in our study. Although it was previously considered an uncommon condition among people of African descent[8] it has been subsequently reported over time to be an increasingly important cause of poor vision in the southwestern[3] and southeastern[9] parts of our nation. Some authors have explained that the increasing prevalence of ARMD is due to increasing number of older people due to higher survival rate from improved health facilities and improved diagnostic facilities and skill from subspecialisation in the developing countries[10]. Having been reported to be a common form of retinal diseases among the elderlies we were not taken aback when we found AMD to be the second leading (22.6%) cause of bilateral blindness in our study after retinitis pigmentosa. The observed rate is higher than reports from Independent authors with rates of 12.8%[11], 14.5%[12].

Diabetic retinopathy was the second leading retinal disorder in this study having been diagnosed in 16.3% of the total retinal cases. This rate is lower than the 24.9% reported in southeastern Nigeria[4] but similar to the Ibadan study[3] where diabetic retinopathy was found to be one of the significant retina diseases. It is however higher than the 9.6% rate in another southwestern Nigeria tertiary eye care centre[1]. Visual loss from Diabetic retinopathy has been predicted to have a likelihood of an upward trend with the maturing epidemic of diabetes unless there is an improvement in early detection and treatment[13]. In this study the high rate of diabetic retinopathy could be partly due to the compulsory dilated eye examination offered as part of our retinal services to the diabetic patients receiving care from the endocrinology department of our hospital. Diabetic retinopathy accounted for 9.7% of cases of bilateral

blindness in our study. It has been reported to contribute 5% to global blindness[14] and a major cause of blindness in an Onitsha hospital –based study.[2]

Retinal vascular disorders, the 3rd leading retinal disorder in our study accounted for 29.9% of cases of unilateral blindness at presentation. Retinal vein occlusions (RVOs) are the second most common blinding vascular retinal disorder after diabetic retinopathy and is a frequent cause of vision loss and blindness[15]. A rate of 7.4% was reported in south-south Nigeria[16]. A study in south-eastern Nigeria reported retinal vein occlusion as one of the leading retinal disorders[2]. Another study in Benin City on the other hand reported a low incidence of retinal vascular occlusion[17].

Toxoplasma retinochoroidits was also a common eye disorder found among 9.1% of our patients. It has been reported to be responsible for majority of infectious uveitis (intraocular inflammation) cases[8,19]. While some authors opined that the diagnosis is usually accomplished serologically because symptoms are very non specific[20]. Some others have reported that the presence of anti T. gondii IgG antibodies does not confirm toxoplasmic etiology as it can often persist at high titres for years after acute infection with a high prevalence of the antibodies in the general population[21] and the marked individual variations in the time elapsing between the onset of clinical symptoms and the activation of specific antibody production giving rise to a resultant high proportion of false negative results.[22] None of our patients had serologic testing for anti-toxoplasmosis antibodies or polymerase chain reaction because of the lack of the diagnostic kits in our laboratory facility like most centres in our developing country. The diagnosis of toxoplasma chorioretinitis were made based on clinical examination finding of focal chorioretinitis with overlying vitritis[23]. It was found to account for 6.5% of unilateral blindness in this study. The risk of morbidity in toxoplasma retinochoroiditis has been found to increase if the disease extends to structures critical for vision like the macula and the optic disc and other complications like retinal detachment or neovascularisation.[24]

The diagnosis of retinitis pigmentosa was made in 5.9% of our patients. This rate is lower than the 11.1% reported in Ibadan[3]. Retinitis pigmentosa in this study accounted for 29.03% of cases of bilateral blindness. 54.2% of the cases were blind at presentation while 33.3% had low vision. It was found to be one of the major causes of bilateral blindness and visual impairment in South East Nigeria[2]. The high degree of visual loss in patients with this condition have been related to the long duration of the disease and age of the patients at presentation.[25]

Retinal detachment, pathological myopia, full thickness macular hole, Posterior vitreous detachment, macular scar and Parafoveal telangiectasia were also common disorders found among our patients. All these disorders contribute to the burden of blindness and visual impairment through various mechanisms especially when there are delays in presentation and treatment. It is not therefore too surprising to find out that about 26% of our patients had to be referred for optical low vision aids. All others benefitted from one intervention or the other ranging from drugs (28.9%), Intravitreal antiVeGF (12.84%), reassurance (12.10%, Laser (11.85%) to surgical intervention in 10.4% of cases.

Optical Coherence tomography (OCT) and fundus fluorescein angiography (FFA) were the most frequently requested investigations for our patients. The role of OCT and FFA in the management of retinal disorders in a centre like ours can therefore not be overemphasized. Fundus fluorescein angiography have been described as a safe invasive outpatient procedure which will enhance more specific diagnosis, treatment decisions and progress monitoring in vast majority of patients with vitreo-retinal diseases[1,3,6]. The high cost of procurement and maintenance of these equipment have made them scarce in our country[2,3] and where available in few private settings the costs are rather out of reach for the common man. It was observed from this study that only 7.7% of the patients who needed OCT for diagnosis and follow up carried out the test. This was due to financial constraints mainly as most of the patients needed to travel to a private facility in another state to carry out the required test. Worse still was a lower uptake of 0.8% for fundus fluorescein angiography. ERG and ICG could not be done as the facilities for them were not available in the country. This leaves us to rely more on clinical judgment for the treatment and follow up of most patients. This finding however shows an improvement over the studies by Oluleye[3] and Onakpoya[1] carried out about a decade earlier where none of their patients had any of the investigations. The challenge with this is that patients who require more frequent investigations for follow up are unlikely to have it done.

The treatments offered revealed in table 4 that topical and oral medicines ranked top most on the list.

About ¼ of the patients could only be helped by referral for optical low vision aids. This is as a result of the majority of these patients presenting at an advanced stage of the disease when permanent damage has been caused to the retina. Late presentation at advanced stages of posterior segment disorders have been found to be a common practice in developing countries like ours[6]. This calls for an intensified health talk to increase awareness of retinal disorders among the people of Ekiti and the need for early presentation once a reduction or impaired vision is observed. Another reason for this could be the non availability of an established retinal care unit in our centre until the time of commencement of this study. About 13% of our patients had Intravitreal anti-VEGF injection while another 12% had Laser intervention. These rates are lower than reported rates by Oluleye and Ajaiyeoba[3] but a build up on the report by Onakpoya[1] where the services were not available at the time of their study.

CONCLUSION

Considering the enormous magnitude of retinal disorders as revealed in various studies in different parts of our nation and the scarcity and high cost of investigative facilities we would like to solicit that the government of our nation pay more attention to the procurement and maintenance of these equipments even if it would mean that special investaigation centres be made available in each geopolitical region of the country at subsidized rate in order to further enhance the achievement of the Millenium Development Goals and reduce the burden of blindness from retinal diseases.

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