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Diabetic Retinopathy in Nnewi, Nigeria.

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SUMMARY

The objective of this paper is to determine the incidence and pattern of diabetic retinopathy in a clinic population of diabetics in Nnewi. All consecutive new patients seen at the Diabetic Eye Clinic, Nnamdi Azikiwe University Teaching Hospital Nnewi, Nigeria, between March 1997 and September 1998 were examined. Examination methods included interviewer-administered structured questionnaire, visual acuity test, external eye examination, refraction, tonometry, gonioscopy, binocular indirect ophthalmoscopy and slit lamp fundus examination with 78D non-contact lens. Data on patients with diabetic retinopathy were analysed and presented in this report. 33 patients (61 eyes) out of 100 new patients had diabetic retinopathy. Of the 33 patients, 14 did not know that diabetes could cause visual loss; 16 had not consulted any eye health worker. None had laser or vitreo-retinal surgery. Six patients were bilaterally blind and another 6 had uniocular blindness. Visual impairment in the better eyes was recorded in 12 patients. All cases of bilateral blindness in this cohort were due to diabetic retinopathy and its complication (neovascular glaucoma). The severity of diabetic retinopathy is as follows: mild non-proliferative diabetic retinopathy (NPDR) 23 eyes; moderate NPDR 20 eyes; severe NPDR 2 eyes and proliferative diabetic retinopathy 16 eyes. Vitreous haemorrhage (4 eyes) and traction retinal detachment (8 eyes) complicated proliferative diabetic retinopathy. Concurrent diabetic maculopathy was found in 34 eyes viz: clinically significant macular edema (CSME) 33 eyes; Non-CSME 1 eye. Diabetic retinopathy is not rare in Nigerians. Diabetics should be educated on the ocular complications of the disease. Since laser and vitreo-retinal surgery will reduce visual loss in the patients, these facilities should be provided in eye hospitals in Nigeria.

KEY WORDS: ***Diabetic retinopathy, incidence, visual loss, Nigeria.***

INTRODUCTION

Diabetes mellitus occurs worldwide. It is one of the leading non-communicable diseases in Nigeria[1]. The incidence of diabetes mellitus appears to be increasing in many parts of the world including communities in developing countries where the disease had been rare[2]. An increase in the incidence diabetes and hyperglycemia has also been recently observed among Nigerians[3]. The eye is usually affected by diabetes and diabetic retinopathy is the most devastating ocular complication of the disease. Diabetic retinopathy is the commonest cause of blindness among persons of working age group in industrialized countries[4,5]. Previous reports indicated that diabetic retinopathy was rare in Nigerians[6,7]. But a recent study revealed that diabetic retinopathy constituted 14% of retinal diseases at the Guinness Eye Hospital Onitsha[8]. Visual loss from diabetes mellitus is treatable by timely application of laser photocoagulation and, when indicated, vitreo-retinal surgical techniques[9]. These facilities are not available in many developing countries and in the face of competing demands it becomes necessary to study the magnitude of diabetic retinopathy in our environment in order to make an informed recommendation on investment in these expensive facilities.

This paper describes the incidence and pattern of diabetic retinopathy at the Diabetic Eye Clinic, Nnamdi Azikiwe University Teaching Hospital Nnewi Nigeria, between March 1997 and September 1998.

MATERIALS AND METHODS

This is a prospective study. All new diabetic patients that presented at the Diabetic Eye Clinic, Nnamdi Azikiwe University Teaching Hospital Nnewi, between March 1997 and September 1998

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were examined by the author. An interviewer-administered structured questionnaire was used to obtain information on vital statistics, type of diabetes, knowledge of ocular problems of diabetes, whether the patient had consulted any eye health worker and specific ocular treatment received.

Ocular examination included visual acuity test (Snellen chart), external eye examination with the slit-lamp, refraction, tonometry, gonioscopy, binocular indirect ophthalmoscopy and slit-lamp fundus examination with 78D non-contact lens.

Data on patients with diabetic retinopathy were subjected to further analysis and constitute the subject of this report. Diabetic retinopathy, including maculopathy, was classified according to the Diabetic Retinopathy Study (DRS)10 and Early Treatment Diabetic Retinopathy Study (ETDRS)[11] criteria. Blindness was defined as visual acuity less than 3/60 while acuity greater than 3/60 but less than 6/18 was regarded as visual impairment.

RESULTS

During the study period, 100 new diabetic patients with a mean age 57.2(14SD) years were seen; 17 had insulin dependent diabetes mellitus (IDDM) and 83 had non-insulin dependent diabetes mellitus (NIDDM). There were 68 male and 32 female patients.

Thirty-three out of 100 new diabetics (33%) had retinopathy. There were 24 males and 9 females; mean age – 56.4 (10.7SD) years; range – 34-74 years. Twenty-six patients had NIDDM; 7 had IDDM. The mean duration of diabetes was 12.3 (7.4SD) years; range – 1–29 years.

While 14 patients (42.4%) did not know that diabetes may lead to visual loss, 16(48.5%) had not seen any eye health worker. None of the 33 patients had received any specific treatment (laser, for instance) for diabetic retinopathy. Two patients did not know they had diabetes and diagnosis was made through routine urinalysis and blood sugar tests in the general eye clinic.

Sixty-one eyes of the 33 patients had retinopathy (Table 1); 26.2% of the eyes had proliferative diabetic retinopathy. Proliferative retinopathy was complicated by vitreous haemorrhage (4 eyes), and traction retinal detachment (8 eyes). One eye had features that gave the impression of a 'burnt out' proliferative retinopathy: fibrous tissues on the disc and other parts of the retinal where there had been active neovascularisation; fibrous traction bands along the major temporal arcades; retinal vessels appeared like white cords; and minimal hard exudates. Concurrent maculopathy was also present in 34 eyes (55.7%) as follows: Clinically significant macular edema – 33 eyes; non-clinically significant macular edema – 1 eye. Of the 5 patients with uniocular retinopathy, three had mature cataract;

Table 1: ***Types of Retinopathy (Eyes)***

Retinopathy	No.	%
Mild NPDR*	23	37.7
Moderate NPDR	20	32.8
Severe NPDR	2	3.3
Very Severe NPDR	–	–
PDR**	16	26.2
Total	61	100.0

*NPDR = Non-Proliferative Diabetic Retinopathy
**PDR = Proliferative Diabetic Retinopathy

one had macular branch vein occlusion; and one had normal fundus in the contra-lateral eye.

Eighteen patients (54.6%) had low vision in their better eyes as follows: bilateral blindness – 6(18.2%); bilateral visual impairment – 8(24.2%); 4 patients with uniocular blindness also had visual impairment in their better eyes. Table 2 shows the causes of blindness and visual impairment. Diabetic retinopathy and its complication (neovascular glaucoma) were responsible for all cases of bilateral blindness. In eyes where macular edema was taken as cause of blindness and visual impairment, there were retinal thickening

Table 2: ***Causes of blindness and visual impairment***

Disease entity	Blindness		Visual impairment	
	Bilateral	Unilateral	Bilateral	Unilateral
PDR**	2(33.3)	1(16.6)	1(12.5)	5(38.5)
Macular edema	2(33.3)	1(16.7)	5(62.5)	4(30.7)
Severe NPDR*	1(16.7)	–	–	–
Neovascular glaucoma	1(16.7)	1(16.7)	–	–
Open angle glaucoma	–	–	1(12.5)	–
Cataract	–	3(50.0)	–	3(23.1)
Branch retinal vein occlusion	–	–	–	1(7.7)
Refractive error	–	–	1(12.5)	–
Total	6(100.0)	6(100.0)	8(100.0)	13(100.0)

NPDR* = Non-Proliferative Diabetic Retinopathy
PDR** = Proliferative Diabetic Retinopathy

and plagues of hard exudate were sitting directly on the fovea. These patients had non-proliferative diabetic retinopathy.

The ocular co-morbidities were as follows: cataract –14 eyes (21.2%); chronic open angle glaucoma – 6 eyes (9.1%); pterygium – 3 eyes (4.5%); macular branch vein occlusion – 1 eye (1.5%). The systemic co-morbidities were hypertension – 7 patients (21.1%); neuropathy – 3 patients (9.1%); nephropathy – 2 patients (6.1%); hypertension and neuropathy – 1 patient (3.0%); hypertension and nephropathy – 1 patient (3.0%). One of the patients with hypertension also had stroke.

DISCUSSION

Diabetic retinopathy is the leading cause of blindness among persons aged 15–74 years in developed countries[4,5]. In the present study, 31 out of 33 (93.9%) patients were aged 74 years or less and 25 (75.8%) of these patients were within the 34–65 year age range i.e. working age group. The 33% incidence of diabetic retinopathy recorded in the present study is comparable to the 30% reported in Australia[12]. Unlike in developed countries, no patient younger than 30 years had retinopathy. Perhaps, this reflects a high mortality among juvenile diabetics in Nigeria.

Studies in Nigeria about 3 decades ago indicated that diabetic retinopathy was rare[6,7]. However, the present study has documented an incidence of 33%. A recent study also reported that diabetic retinopathy constituted 14% of retinal diseases in Onitsha[8]. The current high incidence of diabetic retinopathy in Nigerians is likely to be due to improved general medical care of diabetics which has enabled them live long enough to develop retinopathy. Diabetic retinopathy usually develops 15–20 years after the onset of the disease[13,14]. Although the mean duration of diabetes mellitus in the present study was 12.3 years with a range of 1–29 years, it needs be emphasized that these figures were taken from when diagnosis of diabetes was made. In many patients diagnosis of diabetes is made some years after the onset of the disease and in our environment a diagnosis of diabetes mellitus may be made only when retinopathy had already developed as noted in 2 patients in the present study.

Treatment of diabetic retinopathy requires the timely application of laser photocoagulation and or vitreo-retinal surgical techniques[9] and these facilities are not available in almost all public eye hospitals in Nigeria. That none of the patients in this study has received the currently definitive therapy for diabetic retinopathy is therefore not surprising. In the absence of active intervention, diabetic retinopathy will run its full natural history as seen in the present study: vitreous haemorrhagia, traction retinal detachment, and features of 'burnt out' proliferative retinopathy. All these lead to severe visual loss and avoidable blindness. With a 33% incidence for diabetic retinopathy the need for provision, in all eye hospitals in Nigeria, of facilities for laser photocoagulation and vitreous-retinal surgery is urgent. It is expected that the appropriate use of these facilities will greatly reduce avoidable blindness from diabetic retinopathy. At 18.2%, bilateral blindness from diabetic retinopathy is more than 20 times the 0.9% blindness rate recorded in the general population in the area[15].

Nevertheless, it should be cautioned that diabetic retinopathy is a late complication of diabetes mellitus and its treatment is actually tackling a very late stage of the disease. The ultimate solution lies in the cure or prevention of diabetes mellitus. The Diabetes Control and Complications Trial (DCCT)[16] study report on insulin dependent diabetics has shown that constantly maintaining a good control of diabetes mellitus will delay the onset of diabetes retinopathy and also delay the rate of progression of established retinopathy. On the other hand, up to a third of the patients in the present study had such systemic co-morbidity as hypertension and nephropathy. These systemic diseases are known to worsen diabetic retinopathy and also reduce the effectiveness of laser treatment[9]. As scientists continue the search for the cure or prevention of diabetes mellitus, it is for now necessary to embark on measures that will prevent the development of diabetic retinopathy; minimize the rate of progression of established retinopathy and improve the effectiveness of timely laser therapy. These will be achieved through maintaining a 'tight' control of diabetes mellitus in line with the DCCT guidelines[16] and treating such coexistent systemic diseases as hypertension and renal disease. Medical practitioners and all other health personnel involved in the care of diabetics should educate diabetes mellitus patients on the ocular complications of the disease and the need to have their eyes examined.

REFERENCES

1. Akinkugbe OO. (Ed). Non-communicable diseases in Nigeria. Series 1. Lagos: Federal Ministry of Health and Human Services. 1992; 23–35.

2. King H, Rewers M. Diabetes in adults is now a third world problem. Bull WHO 1991; **69**(9): 643–648.

3. Ohwovoriole AE, Kuti JA, Kabiawu SIO. Casual blood glucose levels and prevalence of undiscovered diabetes mellitus in a Nigerian population. Diabetes Res Clin Pract 1988; **4**:153–8.

4. Ghafour IM, Allan D, Foulds WS. Common causes of blindness and visual handicap in the west of Scotland. *Br J Ophthalmol* 1983; **67**: 209–213.

5. Kahn HA, Hillar R. Blindness caused by diabetic retinopathy. *Am J Ophthalmol* 1974; **78**: 58–67.

6. Abiose A. Retinal diseases in Nigeria - A preliminary report. *Niger Med J* 1978; **6**(2):180–183.

7. Osuntokun BO. Diabetic retinopathy in Nigerians. *Br J Ophthalmol* 1969; **53**: 652.

8. Nwosu SNN. Prevalence and pattern of retinal diseases at the Guinness Eye Hospital, Onitsha, Nigeria. *Ophthalmic Epidemiology* 2000; **7**: 41–48.

9. Olk RJ, Lee CM. Diabetic Retinopathy: Practical Management. Philadelphia: J.B. Lippincott Company. 1993; 157–158.

10. Diabetic Retinopathy Study Report Number 7: A modification of the Airlie House Classification of Diabetic Retinopathy. *Invest Ophthalmol Vis Sci* 1981; **21**: 210–226.

11. Early Treatment Diabetic Retinopathy Study Report Number 10: Grading diabetic retinopathy from stereoscopic color fundus photographs – an extension of the modified Airlie House Classification. *Ophthalmology* 1991; **98**: 807–822.

12. Mitchell P. The prevalence of diabetic retinopathy: a study of 1300 diabetics from Newcastle and the Hunter valley. *Aust J Ophthalmol* 1980; **8**: 231–6.

13. Klein R, Klien BEK, Moss S, et al. The Wisconsin Epidemiologic Study of Diabetic Retinopathy. II: Prevalence and risk of diabetic retinopathy when age at diagnosis is less than 30 years. *Arch Ophthalmol* 1984; **102**: 520–526.

14. Klein R, Klein BEK, Moss S, et al. The Wisconsin Epidemiologic Study of Diabetic Retinopathy. III: Prevalence and risk of diabetic retinopathy when age at diagnosis is 30 or more years. *Arch Ophthalmol* 1984; **102**: 527–532.

15. Ezepue UF. The problem of cataract backlog in Anambra and Enugu States of Nigeria. A solution in community outreach services. *Nigerian Journal of Ophthalmology* 1993; **2**(1): 21–28.

16. Diabetes Control and Complications Trial Research Group. The effect of intensive treatment of diabetes on the development and progression of long term complications in insulin dependent diabetes mellitus. *N Eng J Med* 1993; **329**: 977–86.