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Ocular disorders among stroke patients in Federal Teaching Hospital, Lokoja, Nigeria

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Abstract

Objectives: To determine the pattern of ocular disorders among stroke patients in Federal Teaching Hospital, Lokoja (FTHL).
Materials and Methods: Consecutive new stroke patients seen at the Federal Teaching Hospital, Lokoja over a 3-month period were studied. Data was collected with the use of a structured questionnaire divided into four major sections: bio-data, visual history, results of ocular assessment and NEI VFQ-25 quality of life questionnaire. Data analysis was done using SPSS for Windows, version 23.0. Univariate analyses were presented in the form of frequencies, percentages, means, ranges, and standard deviations, charts and tables.
Results: Eighty-three patients were recruited with an age range of 40-71 years, a mean age of 55.3(±7.1) years. Thirty-nine patients (47.0%) were between the ages of 51 and 60 years. Thirty-four (41.0%) patients were females while 49(59.0%) were males. Of 46 (55.4%) patients that had neuro-imaging, stroke was ischaemic in 37(80.4%) and haemorrhagic in 9(19.6%). Of the 63 patients with left sided stroke, 2 (2.4%), 4(4.8%) and 57(68.7%) had severe, moderate and mild and normal visual impairment respectively while of the 20 patients with right sided stroke, 3(3.6%) each had severe and moderate visual impairment and 14(16.9%) had normal or mild visual impairment. Other ocular abnormalities included corneal anaesthesia and macular hole in 2(1.2%).
Conclusion: Anterior and posterior segments, together with neuro-ophthalmic disorders were found among stroke patients in this study. Many of the ocular abnormalities are as a result of long-standing uncontrolled hypertension which caused the stroke. It is recommended that awareness should be created among the populace about uncontrolled hypertension. It is also advised that internists should refer hypertensive patients for routine ophthalmic screening.

Keywords: ocular, disorders, stroke, Lokoja.

Introduction

A large portion of the central nervous system is dedicated to vision hence its high likelihood of involvement in cases of stroke. Stroke is one of the most common medical emergencies found in hospitals and is of great public health concern because of its huge morbidity and mortality burden.[1] World Health Organization (WHO) defined stroke to be a sudden clinical syndrome of vascular origin which is characterised by rapidly developing global or focal disturbances of neurological function lasting over 24 hours, and may lead to death.[1] The presence of risk factors such as systemic hypertension, diabetes mellitus, dyslipidaemia, transient ischaemic attacks

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have increased the prevalence of stroke. Vascular occlusions along the afferent or efferent visual pathways can produce severe ocular defects such as transient monocular visual loss, visual field defect or ocular motility restrictions.[1-3]

In sub-Saharan Africa, the burden of stroke appears to be on the increase.[4] Though earlier study by Walker in 1994 gave a prevalence of 114/100,000 in sub-Saharan Africa,[5] more recently, a community survey in neighbouring Kwara State in 2015 showed that the prevalence rate had risen to about 134/100,000 population.[6] In Nigeria, there is a dearth of information on the pattern of ocular disorders in patients with stroke. A study such as this would fill this gap in knowledge. Findings from the current study would provide information needed for multidisciplinary care for stroke survivors.

Materials and methods

The study was a descriptive cross-sectional study in which data collection lasted three months (30th May, 2018 to 28th August, 2018). The study was conducted at the Federal Teaching Hospital, Lokoja (FTHL), a tertiary health facility in the middle-belt of Nigeria. Other than Kogi, it serves neighbouring states like Benue, Nasarawa, Niger, Ekiti, Edo States, and some parts of Enugu State. Subjects were recruited from medical outpatient clinic of the Neurology units and medical ward while visual assessments were carried out in the Eye Clinic of the hospital. Inclusion criteria were patients managed for stroke in the Department of Medicine of the FTHL, clinical/radiological diagnosis of stroke by the Neurologist, age 18 years and above and willingness to give informed consent. Excluded from the study were patients with prior ocular trauma and/or injury affecting vision, those that refused to grant informed consent and those patients with co-existing blinding eye conditions like glaucoma or retinal detachment.

Leslie-Kish formula was used to calculate sample size being a cross-sectional study. The calculated sample size was seventy-two (72). Addition of 10% to calculated sample was done to allow for any possible attrition bringing the figure to eighty (80). Informed consent was obtained before questionnaire was administered. Ocular assessment done included visual acuity with standard Snellen's chart, dilated fundoscopy, neuro-ophthalmic evaluations and visual field by Octopus 900 perimetry machine. Ethical approval was obtained from the Ethical Research Committee of FTHL.

Data analysis was carried out using Statistical Package for Social Sciences (SPSS) for Windows, version 23.0. Univariate analyses were presented in the form of frequencies, percentages, means, ranges, and standard deviations, charts and tables.

Results

A total of 83 patients (166 eyes) with age range of 40-71years and a mean age of 55.3 (± 7.1) years were recruited. Thirty-nine patients (47.0%) were between ages of 51 and 60, while 1 (1.2%) was above 70years of age. Forty-nine (59.0%) were males while 34(41.0%) were females giving a male: female ratio of 1:0.7. other socio-demographic parameters are in table 1.

There were 46(55.4%) with radiological evidences of stroke. Thirty-seven (80.4%) of these had ischaemic stroke while 9 (19.6%) had haemorrhagic stroke. Sixty-three (75.9%) patients had left sided stroke, while 20(24.1%) had right sided stroke. Among patients with radiological evidences of stroke, five (10.9%) each had intraventricular bleed and parietal lobe affectation while 17(37.0%) had sub-cortical involvement. As shown in Figure 1, hypertension constituted the largest identified risk factor in the study population.

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Table 1: Socio-demographic characteristics

Variable	No (%)	Mean±STD
Age group		
≤ 40	2 (2.4)	40.0±0.0
41 – 50	19 (22.9)	46.1±2.7
51 – 60	39 (47.0)	56.1±3.1
61 – 70	22 (26.5)	62.9±2.2
>70	1 (1.2)	71.00
Total	83(100)	55.3±7.1
Gender		
Male	49 (59.0)	-
Female	34 (41.0)	-
Total	83(100)	-
Employment Status		
Employed	56 (67.5)	-
House-wife	9 (10.8)	-
Retired	18 (21.7)	-
Total	83(100)	
Highest level of education		
Non-formal	4 (4.8)	-
Primary	16 (19.3)	-
Secondary	23 (27.7)	-
Tertiary	40 (48.2)	-
Total	83(100)	-

Table 2: Visual acuity in the better eyes

Visual acuity			Frequency (%)
> 6/18	0.0 -0.50	Normal/mild visual impairment	74 (89.2)
<6/18	0.52 – 1.0	Moderate visual impairment	6 (7.2)
<6/60	1.02 -1.30	Severe visual impairment	3 (3.6)
Total			83(100.0)

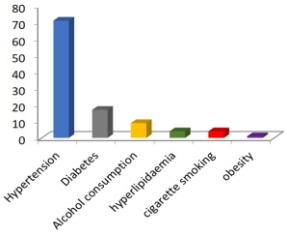

Figure 1: Risk factors for stroke (multiple responses)

Table 3: Ocular adnexal and anterior segment findings on eyes of affected side

Findings	Frequency(%)
Mild ptosis	4 (4.8)
Cornea anaesthesia	2(2.4)
Abducens nerve palsy	6 (7.2)
Oculomotor nerve palsy	3 (3.6)
*RAPD	5 (6.0)
Cataract	67 (80.7)
Pseudophakic	11 (13.3)
Aphakic	1(1.2)

*RAPD = Relative afferent pupillary defect.

Table 4: Posterior segment findings in patients

Diagnosis	No. (%)	Number of eyes(%)
ARMD*	7(8.4)	14 (8.4)
Macular hole	2(2.4)	2 (1.2)
Mild NPDR**	2(2.4)	4(2.4)
Glaucomatous optic atrophy	4(4.8)	8 (4.8)
Hypertensive retinopathy (grade 1)	10 (12.0)	21(12.7)
Hypertensive retinopathy (grade 2)	21 (25.3)	41 (24.7)
Hypertensive retinopathy (grade 3)	8(9.6)	15 (9.0)

*Age related macular degeneration
. ** Non proliferative diabetic retinopathy
Total number of patients N= 83 / Total number of eyes =166

stroke, five (10.9%) each had intraventricular bleed and parietal lobe affectation while 17(37.0%) had sub-cortical involvement. As shown in Figure 1, hypertension constituted the largest identified risk factor in the study population.

Seventy-four (89.2%) had normal visual field findings while 4(4.8%) had homonymous hemianopia. Three out of the four had left sided stroke, while one had right-sided stroke. Three patients with left-sided stroke had glaucomatous visual field changes. One (1.2%) patient with left sided stroke was not cooperative, hence had unreliable result. Various forms of ocular abnormalities were seen in 69(83.1%) of the stroke survivors. Whereas 60 (72.3%) right eyes (RE) had abnormalities, left eye (LE) abnormalities were noted in 58(69.9%) eyes.

Table 2 showed visual acuity in the better eyes while tables 3 and 4 showed anterior and posterior segment findings respectively.

Discussion

The mean age of study population was 55.3(± 7.1) years with 74.7% above 50years implying that increasing age is a risk factor for stroke. This is in keeping with the study by Adeloye[2] in a systematic review of 19 studies from 10 African countries. Other studies in sub-Saharan Africa by Connor et al[5] and Walker et al[4] also reported that increased age is associated with higher incidences of stroke as other co-morbid factors such as hypertension and physical inactivity are seen more with increasing age. In Caucasian population, however, there is a much higher mean age incidence of stroke (above 75 years).[7]

The male predominance (M: F = 1:0.7) is similar to the findings in the study done by Walker et al[4] and Mathers.[8] A male dominance (M: F = 2:1) was also established in the work of Watila et al9. One other hypothesis for this is that there is a higher prevalence of tobacco smoking, alcohol ingestion, and systemic hypertension amongst men which are major cardiovascular risk factors.[10-12]

Ischaemic and haemorrhagic strokes were seen in 80.4% and 19.6% of recruited patients with radiological evidences of stroke respectively and is in keeping with findings from the study by Sanya et al[13] which reported that ischaemic stroke was present in 71.1% and haemorrhagic stroke in 25.5% of their subjects. However, in another study by Ogun et al,[14] it was reported that 49.0% of their subjects had ischaemic stroke but their diagnosis was based on clinical evaluation rather than radiological imaging. Left sided stroke was more common than right sided ones probably due to differences in intima-media complex and higher flow velocity in left carotid artery, leading to higher stress and intimal damage thereafter.[15-18]

In contrast to findings in study in University of Benin Teaching Hospital (UBTH), by Olubor et al[19] where 14(16.5%) patients had severe visual impairment, only 3(3.6%) had severe visual impairment in this study. While senile cataract accounted for most of the visual impairment in both studies, the variation could be due to the higher average ages of the University of Benin Teaching Hospital (UBTH) patients: 66.08(±10.99) years with more age-related ocular pathologies such as cataract as against 55.3 (± 7.1) years in this study.

Visual field loss following acute episode of stroke was reported in 45-67% of patients but this reduced to 8-25% on a long-term following adjustment for recovery.[20,21] In this index study, visual field evaluation showed that 4(4.8%) of patients had homonymous hemianopia as some who were probably symptomatic previously, may also have had recovery at the time of undergoing visual assessment. This is contrary to the findings in the study by Rowe et al[22] that reported prevalence of 52.3%. This could be due to the mode of patient selection as he recruited patients with complaints of visual defects as compared to this index study in which consecutive patients were recruited. It is

worthy of note too that while Rowe et al[22] used confrontational method for visual field assessment for two third of the patients, this index study relied totally on automated perimetry which is more reliable during periods of recovery.[23] In a study by Armin,[24] it was reported that the presence of dense homonymous hemianopia on admission lasting more than 24 hours with any sensory or motor defects had a poor prognosis for rehabilitation and survival. However, Gray et al[25] reported that despite the poor prognostic relevance of homonymous hemianopia, about 10% recovered within 3weeks on admission hence, for patients recruited after three weeks of onset of stroke, the prevalence of homonymous hemianopia could be reduced. In view of the above, timing of visual assessment is vital in further studies on this subject matter despite the challenges of late presentation to the hospital in several instances.

Mild unilateral ptosis was noted in 4 (2.4%) eyes. This is similar to the findings in the study done by Olubor et al[19] where they noted presence of mild ptosis in 2.9% of the eyes examined. This is far less than the 37.5% recorded in the study by Averbuch-Heller et al.[26] The marginal disparity might be due to time patients were recruited for the studies. Averbuch-Heller et al.[26] recruited patients within 48hours of onset of stroke while the current study recruited patients whose condition had lasted up to a year after onset. There is a possibility of resolution of some neuro-ophthalmic abnormalities over an extended period of time.

Cornea anaesthesia was noted in 2(1.2%) of the eyes. This could be as a result of the implication of diabetes mellitus as a risk factor for stroke.[5,8]

Ocular motor nerve palsies were noted in 9 (5.4%) of the eyes. This is in contrast to the findings by Rowe et al[22] that observed 10% of subjects had ocular motor palsies. The presence of RAPD in 5(3.0%) of the eyes was much lower than the 11.8% reported in University of Benin Teaching Hospital (UBTH)[19]. This may be due to the high prevalence of glaucomatous optic neuropathy in the UBTH study (14.2%) compared to 4.8% in the current study.

The slight decrease in incidence of cataract in this study (67.5%) when compared to 71.8% in the study in UBTH[19] may be due to higher average age of participants [66.08 years (± 10.99)] compared with the current study. Ezelum et al[27] and Abdull et al[28] reported that cataract was the commonest cause of avoidable blindness in Nigeria especially among elderly population.

About 75% of participants were over 50 years of age. Therefore, posterior segment findings might be a combination of predisposing risk factors or aging changes. Seven patients had ARMD and 2(1.2%) eyes of 2 patients had macular hole. The prominence of diabetic and hypertensive retinopathies could be explained on the basis that hypertension and diabetes were the leading predisposing factors for stroke.[29]

Conclusion

Anterior and posterior segment abnormalities are commonly found in stroke patients. These abnormalities compromise vision and compound the disability associated with stroke. It is recommended that stroke patients should be referred for thorough ophthalmic evaluation. By so doing, other ocular diseases associated with hypertension and diabetes can be detected and promptly treated.

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