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Incidence of Stroke in an African City: Results from the Stroke Registry at Ibadan, Nigeria, 1973–1975

B.O. OSUNTOKUN, O. BADEMOSI, O.O. AKINKUGBE, A.B.O. OYEDIRAN, AND R. CARLISLE

SUMMARY Studies based on hospital populations reported from negro communities in several countries in Africa¹ suggest that cerebrovascular disease (CBVD) shows increasing mortality and morbidity in Africans although 2 decades ago CBVD was believed to be uncommon. We report the first study in the African to determine the incidence of stroke in an urban area, Ibadan, Nigeria.

A STROKE REGISTER (which included subarachnoid hemorrhage (SAH) infracerebral hemorrhage (CH), cerebral infarction (CI), but excluded transient ischemic attacks, (TIA) and subdural hematoma) was operated for Ibadan, Nigeria, from April 1, 1973 to March 30, 1975 as part of the international multicentric program of the Cardiovascular Diseases Unit of the World Health Organization. Its purpose was to study the incidence of stroke in several communities. Total coverage of Ibadan was obtained by notification to hospitals, general practitioners, private nursing homes, coroner's office (for cases of sudden death), and the office of the Medical Officer of Health for the city. Case finding of stroke patients was carried out by a Nursing Sister who visited various health institutions in Ibadan at least once a week. The register included only those resident for at least one year in Ibadan. Neurological and clinical evaluation, where possible, was done by 2 neurologists (B.O.O. and O.B.) In others, the diagnosis was based on the case histories and results of available investigations. Follow up after discharge from the hospitals was difficult, for in addition to shortage of personnel, incorrect addresses given by patients made tracing an uphill task and many patients did not return to the clinics for evaluation. The population data for Ibadan, provided by the Ministry of Economic Planning, Western State of Nigeria, were based on projection of the 1963 census.

Results

During the 2 year period, 318 patients were registered and this number almost certainly represented the minimum for most of the patients were seen in hospitals and nursing homes. Table 1 shows that the male to female ratio is 5 to 2 compared with a male to female ratio of 1.3 to 1 in the population. The peak age-specific incidence in the male is in the eighth decade and in the female in the 7th decade, with higher incidence rates in males than in females in almost all age groups and generally low incidence rates in those below the age of 40 years. The apparently low incidence rates in 8th and 9th decades
TABLE 1  Stroke Registry in Ibadan 1973-75 Incidence Rates

<table>
<thead>
<tr>
<th>Age in yrs</th>
<th>Males</th>
<th>Females</th>
<th>Total incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of patients</td>
<td>Incidence per 1,000</td>
<td>No. of patients</td>
</tr>
<tr>
<td>0-9</td>
<td>0</td>
<td>—</td>
<td>0</td>
</tr>
<tr>
<td>10-19</td>
<td>4</td>
<td>0.03</td>
<td>1</td>
</tr>
<tr>
<td>20-29</td>
<td>5</td>
<td>0.01</td>
<td>3</td>
</tr>
<tr>
<td>30-39</td>
<td>18</td>
<td>0.12</td>
<td>8</td>
</tr>
<tr>
<td>40-49</td>
<td>54</td>
<td>0.9</td>
<td>10</td>
</tr>
<tr>
<td>50-59</td>
<td>55</td>
<td>2.5</td>
<td>25</td>
</tr>
<tr>
<td>60-69</td>
<td>60</td>
<td>5.4</td>
<td>27</td>
</tr>
<tr>
<td>70-79</td>
<td>28</td>
<td>7.8</td>
<td>4</td>
</tr>
<tr>
<td>80</td>
<td>5</td>
<td>2.0</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>229</td>
<td>0.25</td>
<td>89</td>
</tr>
</tbody>
</table>

in the females and in the 9th decades in the males may be artifactual due to the low average life expectancy (about 45 years). Those in the 8th and 9th decades in Ibadan represent only 0.7 percent of the population, whereas 88% of the male and 85% of the female are under the age of 40.

Table 2 shows the type-diagnoses of stroke. Two hundred and sixteen of the patients were judged to be hypertensive (sustained blood pressure > 160/100 mm Hg for at least one week after stroke or found to have other evidence of hypertensive disease — in heart, kidneys, retina.) Eighty percent of patients with SAH and CH, 58% of those with non-embolic cerebral infarction and 76% of those with acute but ill-defined CBVD were hypertensive. Only 67 of the 216 hypertensive patients knew they were hypertensive prior to the onset of stroke and 57 of them were on specific treatment for hypertension.

Seventeen patients (5.3%) suffered from diabetes mellitus.

Table 3 shows the mortality in the series within 3 weeks of admission. Autopsy rate in these patients was only 17%.

None of the 207 survivors at 3 weeks had a recurrence of stroke. At 3 months after the ictus only 76 of the patients could be traced, and 3 of these with an initial diagnoses of CI had suffered a recurrence. Of the 36 patients who could be traced after a year or more, none had suffered a recurrence; 27 were on antihypertensive treatment.

TABLE 2  Ibadan Stroke Registry Diagnoses

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>No.</th>
<th>% of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subarachnoid hemorrhage</td>
<td>36</td>
<td>11.3</td>
</tr>
<tr>
<td>Cerebral hemorrhage</td>
<td>50</td>
<td>15.7</td>
</tr>
<tr>
<td>Cerebral infarction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i) non-embolic occlusion of precerebral arteries</td>
<td>2</td>
<td>0.6</td>
</tr>
<tr>
<td>(ii) intracranial cerebral arterial thrombosis</td>
<td>145</td>
<td>45.7</td>
</tr>
<tr>
<td>(iii) cerebral embolism</td>
<td>8</td>
<td>2.5</td>
</tr>
<tr>
<td>Acute but ill-defined cerebrovascular disease</td>
<td>77</td>
<td>24.2</td>
</tr>
<tr>
<td></td>
<td>318</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Discussion

Results of this study show that stroke in the Nigerian Africans is commoner in males, its incidence rises with age, and the major predisposing factors are hypertension and diabetes mellitus. In contrast to previously held opinion, based on hospital data, stroke is not unusually frequent in young Nigerians.

The fall in the incidence rates in males in the 9th decade and in females in the 8th and 9th decades is probably due to under-reporting. The higher incidence rate of stroke in Nigerian males, compared with females, may be due to Nigerian females' better tolerance of hypertension. Achson (1960) showed that in Ireland there was a strong correlation in males between coronary artery disease and hypertension and between hypertension and cerebrovascular disease; in females there was no such association.

Attempts to obtain the natural history of stroke in Nigerians were blocked by insurmountable difficulties which prevented adequate follow up. The mortality at 3 weeks found in this study confirms that in Nigerians the better prognosis of non-embolic CI compared with other types and the mortality rates are similar to those reported in other Africans. In the University College Hospital in Ibadan, tetanus, meningitis and CBVD are the major diseases of the nervous system causing death. The annual mortality rate from CBVD, unlike meningitis, analyzed for the period 1960-1973, showed a continuous rise in Ibadan. The frequency of CBVD as a cause of death in University College Hospital, Ibadan, is 4.5%; the other major causes of deaths in the medical wards of the hospital are liver
diseases (12%) of tetanus (9%) hypertensive heart disease (8%) renal failure (6%) and meningitis (4%).

An association between high blood pressure and an increased incidence of cerebrovascular disease has been established for both CH and CI. 

Reduction in blood pressure of hypertensive patients by medical treatment lowers the incidence of future strokes or recurrence of strokes. Of the 27 patients in this community study who suffered from stroke and have been treated with antihypertensive drugs for more than one year, none has suffered a recurrence.

Stroke in hypertensives is frequently due to disease of small intracerebral vessels rather than to atheroma. Hypertension is the major predisposing factor to stroke in the Nigerians as found in this study and by others. In view of the several studies that have indicated that hypertension (and not cerebral atherosclerosis or elevated serum lipids) is the major predisposing cause of CBVD in the African negroes, in whom coronary artery disease is very uncommon, early detection and treatment of hypertension should be beneficial. This may help prevent the rising mortality and morbidity of stroke in some African communities.

Acknowledgment

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References


B O Osuntokun, O Bademosi, O O Akinkugbe, A B Oyediran and R Carlisle

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