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Posterior circulation ischemic stroke in Burkina Faso

Abstract

Objectives: To determine demographics, clinical features and prognosis of Posterior Circulation ischemic stroke ischemic vascular cerebral in Yalgado Ouedraogo University Teaching hospital.

Methodology: It was a retrospective analytical study of patients with Posterior circulation ischemic stroke, covering a period of ten years from July 2006 to June 2016, in the neurology department of the YOUTH. Data were collected using a survey form. These data were compared with that of the literature.

Results: Among 1191 cases of ischemic stroke, there were 61 cases of Posterior circulation ischemic stroke (5.1%). The mean age of patient was 58.62years (18, 87years). Male gender was predominant (67%). The main risk factors of stroke were arterial hypertension (57.38%), tobacco (26.2%) and dyslipidemia (22.9%). Patients with more than 3 risk factors were 60.65% of cases. The common clinical finding was motor deficit (95.08%). Cranial nerve involvement was found in 34.4% of cases. In neuroimaging, the infarct was commonly localized in the distal segment of posterior circulation (50.82%). Multiple localization in posterior circulation was observed in 18% of patients. The most common etiologies were emboligenous heart disease (34%) and atheromatous plaque (26%).The death rate was 19.7%.

Keywords: Posterior circulation, ischemic stroke, prevalence, risk factors

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Introduction

A posterior circulation (PC) stroke is classically defined by infarction occurring within the vascular territory supplied by the vertebrobasilar (VB) arterial system. Posterior circulation strokes represent approximately 20% of all ischemic strokes.[1,2] The mortality associated with this type of stroke is high (40%) because of the diagnostic diagnosis linked to a clinical polymorphism and a lack of specificity of the symptoms.[3] Thus, a good knowledge of the clinical signs makes it possible to avoid aggravation of coma or severe sequelae. MRI brain allows to better visualize the Posterior circulation ischemic stroke. In sub-Saharan Africa, these sub-types of stroke are rare in the literature. Our study for the purposes of describing the main features of these strokes to contribute to a better understanding of the pathology in a context of medical equipment.

Patients and methods

We described restrospectly from July 2006 to June 2016, 61 patients aged between18 and 90years with posterior circulation ischemic stroke from registry of 1191 patients attending a tertiary care referral university hospital. Patients with missing or insufficient records were not included. All patients had done head CT. In brain imaging, the vertebrobasilar territory was subdivided into three segments: proximal, intermediate and distal.[4] The proximal segment includes intracranial vertebral arteries and posterior cerebellar arteries. The middle segment includes the basilar artery and its penetrating branches. The distal segment: superior cerebellar arteries, distal basilar artery and posterior cerebral arteries. Extracranial vessels were evaluated with carotid Doppler in selected patients. Infarct location was decided by clinical assessment and by neuroimaging findings. The analysis of the data concerned the demographics, stroke risk factors, clinical characteristics, neuroimaging, stroke etiologies and outcome. The confidentiality of the information contained in clinical records and hospital registers has been respected by the anonymity of the collection forms.

Results

Demographic profile and risk factors

Posterior circulation ischemic stroke accounted for 61(5.1%) of 1191 of all ischemic strokes seen in the study period. The mean age of the patients was 58.62years (Range 18; 87years). Twenty seven (44.2%) patients were aged over 65years. Ischaemic stroke was more common in age group 71 to 80. Male gender was the most common in 38(62.3%) patients. Thirty (49.1%) patients had urban residence, 25(40.9 %) had rural residence and 6(9.8 %) had not residence mentioned. Famers (23%), housewives (21.3%) and officials (14.8%) were the most occupation of patients. Hypertension was the most common risk factor in 39(63.9%) patients but the majority 53(86.8%) of the patients had more than one risk. Table 1 describes the socio-demographic characteristics features of 61 patients.

Table 1 Risk factors of 55 patients with posterior circulation ischemic stroke

Features	Number (%)
Dyslipidemia	15 (25.4%)
Obesity	4(5.4 %)
Chronic consumption of alcohol	25 (40 %)
Cigarette Smoking	18(29 %)
Diabetes mellitus	6 (9%)
Hypertension	35 (63.6%)

Table Continued

Features	Number (%)
Atrial fibrillation	18 (27.8%)
Cardiomyopathy	19 (31.1%)
Valvulopathy	7(11.4%)
Myocardial infarction	7(11.4%)
History of ischemic stroke	9(14.7%)

Clinical characteristics of posterior circulation ischemic stroke

The mean duration at medical emergencies was 4.07days. Twenty-eight (45.9%) patients were eligible for intravenous thrombolysis. The main symptoms were motor weakness (83.6%), headache (34.4%) and language disorders (27.8%). Neurological examination had found weakness in the limbs (95.1%), dysarthria (57.3%) and cranial neuropathy (34.42%). Table 2 describes the mains abnormalities of neurogical examination.

Table 2 Clinical characteristics of posterior circulation ischemic stroke

Complaint	Number (N=61)	Pourcentage (%)
Motorweakness	51	83.6
Headache	21	34.4
Dysarthria	17	27.8
Unconscienness	16	26.2
Vertigo	16	26.2
Vomitting	8	13.1
Dysphagia	4	6.5
Agitating	2	3.2
Visual field deficits	2	3.2
Respiratorydistress	1	1.6
Movement disorders	1	1.6

Vascular territory and infarct location

Posterior cerebral artery involvement was most common (50.8%), followed by TOB (26.2%). Infarction affected several vertebrobasilar territories in 12 patients (18 %). Signs included carotid involvement in 17 patients (27.87%) Table 3 shows the vascular territorial distribution.

Table 3 Vascular territory involvement

Vascularterritory	Number (N=61)	Percentage (%)
PCA	31	50.8
TOB	16	26.2
PICA	14	22.9
SCA	4	6.5
ICVA	3	4.9
AICA	1	1.6

Topographically, thirty patients had infarct location in a distal territory. There was no significant relationship between age and the type of territory reached (p=0.096). Table 4 describes the subdivision of Posterior Circulation Ischemic Stroke According to Rostral Caudal Location of Infarct.

Table 4 Subdivision of posterior circulation ischemic stroke according to rostral caudal location of infarct

Infarct location	Frequency (N=61)
Distal	30(49.1%)
Middle	14(22.9 %)
Proximal	17(27.8%)

Table 5 Distribution of patients about treatment

Treatment	Number (N = 61)	Percentage (%)
Antiplatelet	53	86.8
Antihypertensivedrug	34	55.7
Antidepressants	26	42.6
Statins	22	36
Antivitamin K	17	27.8
Physiotherapy	16	26.2
Antibiotics	11	18
Pain killers	9	14.7
Speech therapy	2	3.2

Ultrasound of extracranial vessels

Doppler ultrasound of the supra-aortic trunks was performed in 28(45.9%) patients. Ultrasound was normal in one (3.7%) patient. It showed an elevation of vertebral circulatory resistance indexes in the vertebral artery in one (3.7%) patient. The others lesions were extracranial carotid stenosis in 26 (92.8%) patients.

Cardiac exploration

Electrocardiogram was performed in 33 patients (54.1%). There were atrial fibrillation in 10 patients, ST segment elevation in 3 patients, cardiac hypertrophy in 12 patients, and branch block in 7 patients. Cardiac ultrasonography was performed in 31(50.8%) patients. It showed ischemic cardiomyopathy in 20 patients, dilated cardiomyopathy in 6 patients, mitral valve disease in 6 patients and pulmonary arterial hypertension in 2 patients. Cardiac diseases with risk for embolism were reported in 17 patients (34%). Large vessel atherosclerotic disease and small vessel disease were found in 13 patients (26%). The etiology was indeterminate in 31 patients (50.8%).

Treatment and prognosis

The main treatments were antiplatelet agents in 53 patients (86.8%), antihypertensive drugs in 34 patients (55.7%) and antidepressants in 26 patients (42.6%). The following table shows the distribution of patients according to the treatments received. Table 5 gives the distribution of patients about treatment.

The length of stay was 11.34days with a mortality of 19.70%. Decubitus complications were noted in 10 patients (26.2%). There was a significant relationship between death and state of consciousness (p=0.024). On the other hand, this link was present between the death and the topography of the vertebrobasilar involvement (p=0.385).

Discussion

According to several authors, cerebral infarctions in Posterior Circulation represent more than 20% of ischemic strokes.[5,6] We observed a lower frequency of ischemic stroke (5.1%) like in India (11.45%).[7] A higher prevalence was found respectively in Lausanne

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stroke registry (26.7 %)[8] and in Hallym Stroke Registry (HSR) with 39.8%.[9]

This difference between the studies can be explained by the absence of cerebral MRI which better explores the vertebrobasilar territory.[10] The mean age of patients was 58.62years in our study. This result was lower than in a study in Korea (63.4years)[10] but higher than in a study in India (51.7years).[7] On the other hand, it is clearly inferior to that found by Zhou et al in France (73.3years).[11] The difference with Zhou's study can be explained by the demography in Africa. In fact, stroke in sub-Saharan Africa affects younger patients whose age is between 44.4years and 61years.[12] The male predominance of our series (62.3%) seems to be observed in patients with ischemic stroke in the vertebrobasilar territory.[8,13] The main reasons for consultation were motor deficit (95.1%), headache (34.4%) and language impairment (27.87%). Kora SA and all in India[14] had found a predominance of the motor deficit as we did but other authors found a predominance of vertigo.[7,15,16] In our situation, vertigo is less apparent than the motor deficit, which worries the patients and their entourage. Among vascular risk factors, arterial hypertension ranked first with 63.6 % of cases. Arterial hypertension increases the risk of stroke by a factor of four.[8,17] Rawat KJ and all in India[18] showed that tobacco was the main risk factor for vascular disease. The role of smoking in the occurrence of stroke is well described in the literature. A history of stroke was found in 13.1% of patients, which is comparable to the result of Raveloson (11.76%).[19] The presence of a recurrence after a first stroke is explained by the non-observance of treatments in low socioeconomic patients who do not benefit from health insurance. In our context, the impairment of the vertebrobasilar territory is characterized by a motor deficit (95%), a cerebellar ataxia (55.7%) and an impairment of the cranial nerves (34.4%).The disorders of the consciousness come far behind with 24.5% of the cases. Our results are similar to those of Merwick et al.,[5] Rawat in India[18] had found a predominance of motor deficit and disorders of consciousness (63%). This frequency of disturbances of consciousness reflects the severity of intracranial hypertension related to massive ischemic stroke. The detection of infarction in Posterior circulation is based on cerebral MRI which is unavailable in emergency in our context. Non-injected cerebral CT scan were performed in all the patients. There was a predominant involvement of the territory of the posterior cerebral artery in 50.8% of cases. Like us, Mannohan[7] showed a predominance of Posterior cerebral artery in 53.75%. Rawat in India[18] found that the mostcommon site of infarct in posterior circulation stroke was cerebellum (37.5%) followed by occipital lobe (24%). We observed multiple site of infarction in 18% of cases, like LEE JH et al.,[10] who observed in his study a frequency of 16.4%. We had found a frequent involvement of the distal segment (49.1%) followed by proximal (28.3%) and medial involvement (22.9%).

Bogousslavsky in Switzerland made the same observation with 59% of cases.[8] Unlike us, Lee JH et al.,[10] in South Korea in 2006, reported more involvement of the medial segment. In our study, distal segment involvement was predominant in patients after 40years, while medial involvement was predominant in patients under 40years (55.5%) but there was no significant relationship (p=0.096). Vertebrobasilar involvement was multiple in 18% of our patients, which is similar than observed by Lee JH et al in South Korea (16.4%).[10]

In our study, the most common etiology was indeterminate in 50.8% of patients, followed by cardioembolic stroke in 34% and large and small vessel disease in 26%. Chung C in Taiwan found large vessel disease in 20.6% of patients.[20] Large and small vessel diseases were the most common etiology in a study from India (80%). The difference with these studies could be explained by the high frequency inderminated causes due to a lack in cardiac explorations and the poor performance of the ultrasound scan of ASDs (3.5%).

The length of stay was 11.34days with a mortality rate of 19.70%. Unlike us, Lee JH et al.,[10] in South Korea found a mortality of 4.1%. Rawat found a mortality rate of 12.5%) and Kora a mortality of 26.3%.[14] This difference could be small in our sample. In addition, the main factors related to death were the state of consciousness at admission (p=0.024). These disorders of consciousness concerned 24.5% of patients.

Limitations

This study had some limitations due to his retrospective design, the small size of the population study and the absence of MRI. Patients had some investigation explains the high rate of indeterminate causes

Conclusion

This study from Burkina Faso describes the clinical characteristics, the pattern of risk factors of posterior circulation ischemic stroke. Cardioembolism disease is the most common cause of posterior circulation ischemic stroke in our study. Distal territory involvement was most common in our study. Our data suggest that etiology, risk factors and lesion topography in posterior circulation ischemic strokes can have regional variations.

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Conflict of interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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