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Research Article

Subarachnoid Hemorrragia in the Neurology Department at the Gabriel Toure Hospital-University Centre: A Five-year Retrospective Study

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Abstract

Subarachnoid hemorrhage (SAH) is a form of stroke less represented in terms of incidence, however, the first in terms of morbidity and mortality. Our goal is to study the epidemiological, clinical, therapeutic and prognostic aspects of subarachnoid hemorrhage (SAH).

Methodology: This study was conducted in the Department of Neurology at Gabriel Touré University Hospital in Bamako. This is a retrospective study of inpatient records for SAH in Neurology between January 2011 and December 2016. All cases of spontaneous SAH, confirmed by a brain scan, were included. Cases of traumatic SAH, cases of systemic hemorrhagic stroke with ventricular break-in were not included. Fisher scale was used to categorize patients.

Results: We collected 41 patients including 20 men and 21 women. Patients aged 40-59 years were the most represented (n = 24). Nineteen patients (46.34%) had no known risk factors. The main cause of admission was 51.22% isolated headache (n = 21). On examination, the meningeal syndrome was present and complete in 70.73% (n = 29). Six patients did not receive Nimodipine and four of these patients experienced vasospasm during their hospital stay. There was a mortality of 21.95% (n = 9).

Conclusion: Our study confirms the data of African literature. The frequency of SAH is underestimated due to a lack of appropriate diagnostic means.

Keywords: Bamako; Department of Neurology at Gabriel Touré; Subarachnoid Haemorrhage

Abbreviations

Stroke: Cerebral Vascular Accidents; ARM: Magnetic Resonance Angiography; HAS: Hemorrhage Under Arachnoidian; HTA: Hypertension Arterielle; MRI: Magnetic Resonance Imaging; TDM: Tomodensitometrie

Introduction

Subarachnoid hemorrhage (HSA) is a bleed between the arachnoid and the magpie mother. It is a form of stroke less represented in terms of incidence (5%) [1], however, the first in terms of mortality of up to 32% to 67% in the first hours [2]. It mainly affects a relatively young population with dramatic socio-economic consequences [3].

The scarcity of publications on the subject in sub-Saharan Africa may be related to the availability and accessibility of diagnostic tools (CT, MRI, ARM) [4].

This 5-year retrospective work in Mali aims to study epidemiological, clinical, therapeutic and prognostic aspects on the one hand and to address African specificities in the management of non-traumatic arachnoid haemorrhage.

Materials and Methods

This work took place at the Gabriel Touré University Hospital in Bamako. This was a retrospective study that looked at the records of patients hospitalized for HSA in the Neurology department between January 2011 and December 2016. All cases of spontaneous HSA were included, confirmed by a brain scan. Not included were cases of traumatic HSA, cases of systematic hemorrhagic stroke with ventricular break-in.

The selected data were categorized into four types of variables:

- Socio-demographic data
- Clinical and paraclinical data. The Fisher scale was used to categorize patients
- Data on complications
- Processing data
- The way out in the service
- The data was collected on an individual medium (investigative file), entered on Microsoft office World and Excel 2010, transferred and analyzed on SPSS 20A.0 software.

Results

During the study period 1505 patients were hospitalized in the Neurology department, including 41 HSA files, referred by the Emergency Home Department of the Gabriel Touré Hospital. They were 20 men and 21 women, 71.4% of whom were housewives. The age group of [40 - 49 years] was the most represented with 31.7%, followed by the age group [50 - 59 years]. About 76% of the patients resided in Bamako. As for the period of symptom onset, 18 patients (43.9%) had their symptoms in the morning between 5 a.m. and 9 a.m. (Table 1). In terms of the season of occurrence we had found a higher frequency of HSA in the warm season (February, March, April, May, June) with 22 patients or 53.66% (Table 2). Regarding risk factors 9.76% of patients were tabagic, 12.2% had another additional risk factor in addition to tobacco (HTA, Diabetes, alcohol, other drug), 29.27% of our patients were known to be hypertensive with no other associated risk factor (Table 3). A brutal and unusual headache was reported as a telltale mode in the majority of patients. These were isolated headaches for 51.22% of patients. As for the neurological examination data meninge syndrome was present and complete in 70.73%. The brain scan without injection confirmed HSA in 100% of our patients. In terms of Fisher's categorization, grade 2 was the most represented, 65.85%, followed by grade 4 (26.83%). Cerebral angioscanner was performed in 2 patients, positive in one patient. None were able to perform MRI/ARM or arteriography.

Moment of coming	Staff	Percentages
0 am - 4 am	6	14.63
5 am - 9 am	18	43.9
10 am - 2 pm	6	14.63
3 - 7 p.m.	2	4.9
8 pm - 24 pm	9	21.95
Total	41	100

Table 1: Breakdown of patients by time of day in the nycthemer.

Seasons	Staff	Percentages
Wintering (July - September)	9	21.95
Dry (February - June)	22	53.66
Cold (October - January)	10	24.39
Total	41	100

Table 2: Patient breakdown by season.

Risk factors	Staff	Percentages
HTA	12	29.27
Tobacco	4	9.76
HTA and Tobacco	4	9.76
HTA and Diabetes	1	2.44
Tobacco-Alcohol-Drugs	1	2.44
None	19	46.34
Total	41	100

Table 3: Patient breakdown by risk factors.

As for the therapeutic aspects, six patients did not receive Nimodipine and in this group, 4 patients had a motor deficit in hospital probably due to vasospasm. Five patients, 12.2%, developed rhythm disorders following as a result of asS and 10 patients had comitial seizures during their hospitalization, or 24.4%. Mortality in our series was 22%.

Discussion

In this 5-year work, we report our experience in the management of HSAs. This work, like other work in sub-Saharan Africa, focuses on the issue of accessibility and availability of diagnostic tools essential for the management of this pathology.

Epidemiologically, we report 41 cases of HSA in 5 years or 2.72% of all patients admitted to the Neurology department over this period. By reporting this data to the Malian population (14 million), the incidence in Mali is less than 1 case/million inhabitants/year. In Togo [4], it is estimated at 1 case/million inhabitants per year. In Europe the incidence of this condition is estimated at 190 cases/million inhabitants/year [5]. This relatively low incidence of HSA in our work could be explained by: on the one hand the monocentric nature of our study and on the other hand by a recruitment bias. Indeed, the vast majority of patients admitted for headache without motor deficit will not have brain imaging for reasons of accessibility (cost of examination) or availability. And a significant proportion of HSA is not hospitalized.

Regarding the socio-demographic aspects we have confirmed in this work that HSA remains a pathology of the young subject. Indeed, more than half of our patients (58.53%) were between 40 - 59 years of age with a peak of between 40 - 49 years of age. In Morocco [6], a 17-year retrospective study (1983 and 1999) also found a high prevalence of HSA between 40 - 60 years of age or 84% of patients and a peak in the same age group [40 - 49 years]. In Togo [4], Ahanogbe., *et al*. found an average age of 48.3 years. Whereas in Nigeria [7], Ogungbo., *et al*. found a high prevalence before 40 years and low after 50 years. Elsewhere, large cohort studies in Asia [8] and Europe [5.9] confirm this finding.

We have not found the female predominance commonly reported in the literature, this situation is probably related to a recruitment bias [10]. However, a Finnish study [11] of 492 cases of ASS out of a population of 65,521 participants followed from 1972 to 2007, noted that the female sex is not a certain risk factor independent of HSA in the absence of other associated factors such as tobacco or alcohol that weaken women and predispose them more to the formation of aneurysms than men. However, the notion of alcohol-smoking poisoning is not found in our patients, this situation could be explained by socio-cultural factors.

In terms of the season of occurrence, our results are similar to those of Tarnoki., *et al*. [12] who found that the occurrence of HSA was predicted by a high air temperature in South Florida. Indeed, we had found a higher incidence of HSA in the hot season (February, March, April, May, June). In Africa, we found no data on the season/HSA link. On the other hand, another previous study conducted in Mali on "strokes and seasonal variations: study of 219 cases" [13] showed that the months of March and June had a significantly high frequency pour hemorrhagic stroke in addition to November and December. Most Western studies claim a higher incidence in periods of low temperature [14]. Nevertheless, a retrospective Korean study of 111,316 HSA records indicates that warm and cold temperatures all contribute significantly to the incidence of ASS, but that no seasonal and monthly variation is evident [15]. Seasonal and nycthemeral variations in the incidence of HSA remain a topic of discussion. We explain the discrepancies by the fact that the climate changes according to the places of the studies. For example, the tropical climate is different from the Mediterranean climate, as the intensity of the cold or heat is not unequivocal in both climates.

HTA was the most represented risk factor in our sample as in other African publications [4.6] followed by active smoking. Large cohort studies have shown that HTA, active smoking and alcohol are major risk factors for ASS. In addition, they contend that 7 to 20% of aneurysmal HSA patients have a first- or second-degree relative with a confirmed intracranial aneurysm [5,16].

More than half of the patients admitted for headache had no nausea, vomiting or focal neurological deficit. It was probably sentinel headache, isolated and often mistaken for a migraine attack in 10 to 40% of patients. It may precede the classic headache in thunderbolt [17]. At the admission examination, meninge syndrome was not present in all of our patients. It is not essential for diagnosis according to the meta-analysis of Long., *et al*. because its

occurrence can be delayed by several hours in 35% of patients. The same study found sensitivity to more than 99.0%, with a specificity of 99.9%, for a CT obtained within 6 hours interpreted by an experienced radiologist [18]. And traditionally, a lumbar puncture (PL) is done in case of normal CT in the face of a suspected HSA. We did not have to use it because CT had confirmed HSA in 100% of our patients. Because of the cost and its unavailability at the site of the study, only 2 patients performed the angioscanner. The examination was normal in one patient and detected a 4 mm aneurysm on the average cerebral artery in the other patient. The angioscanner is effective for the detection of aneurysms larger than 3 mm with a sensitivity of 98% and a specificity of 100% [18]. MRI/ARM, especially optimal for patients who present during the subacute or chronic period [18] have not been performed. Angiography, which remains the most reliable imaging method for diagnosing an aneurysm and defining its anatomy, is not feasible in Mali. This problem of etiological diagnosis is noted by the majority of authors in South Saharan Africa [4].

Regarding the management of HSA, a literature review [19] was published in 2008, confirming the interest of calcium antagonists in the prevention and treatment of vasospasm in HSA. The authors recommend oral nimodipine (60 mg every four hours, to be continued for three weeks) as standard treatment in patients with aneurysmal HSA given the potential benefits and modest risks of this treatment, although the evidence for its beneficial effect is not beyond doubt. While there is no evidence that nicardipine has a significant effect on functional outcome. In our work on the 6 patients who were not put on Nimodipine, 4 patients presented a motor deficit by vasospasm, thus confirming, the interest of this molecule in the management of HSA in our context.

As other complications found, 12.2% of our patients developed rhythm disorders following as a result of as ASM. These abnormalities are detectable to ECG in nearly 100% of patients [20] but they are nonspecific and transient [21], which may explain our low rate. Ten patients had comitial seizures during their hospitalization, or 24.4%. This rate is higher than the 15% found by the Huttunen., *et al*. study [3] where the therapeutic means were early and follow-up conditions were better.

The mortality rate was about 22%, which is superimposed on data from the African literature [4,6] and Western literature [3].

Conclusion

HSA remains a serious pathology, it is a diagnostic and therapeutic emergency that requires multidisciplinary management. Our study confirms data from the African literature. The frequency of HSA is underestimated due to a lack of appropriate diagnostic means. The equipment of our health facilities and a qualified and sufficient human resource will improve the prognosis of this pathology.

Conflict of Interest

The authors have no conflict of interest.

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