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Spontaneous Subarachnoid Hemorrhage: The Reality of Management in Madagascar

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Abstract

Introduction: Spontaneous subarachnoid hemorrhage (SAH) is a serious condition requiring urgent management in a specialized setting. It is punishable by a high mortality rate. The objective of this study is to describe the reality of the management of patients who presented SAH in Madagascar.

Method: This is a multicenter retrospective study of a series of 62 cases of SAH over a four-year period at two Neurosurgery Centers in Antananarivo.

Results: We observed a female predominance with a gender ratio of 0.24. The average age was 49.29 years. SAH was aneurysmal in 52 patients (83.87%) and non-aneurysmal in 10 patients (16.13%). The average diagnosis time was 4.09 days. The average time for management was 7.16 days. Only 08 patients (12.09%) were diagnosed and admitted to a specialized ward on the same day. For aneurysmal SAH, twenty-eight patients (53.85%) were treated with surgery, twenty patients (38.46%) had not a safe treatment for their ruptured intracranial aneurysms, four patients (7.69%) had endovascular treatment. Patients with SAH including non-aneurysmal patients had treatment in 50% for the prevention of cerebral vasospasm with nimodipine, 60% an anti-hypertensive, and 50% an anti-epileptic. The mortality rate from spontaneous SAH of all types of treatment was 48.3%, or 30 out of 62 patients. The mortality rate remains as high (40%) non-aneurysmal SAH.

Conclusion: The socio-economic development of Madagascar is an indispensable factor in improving the management and vital prognosis of patients with a serious and urgent pathology such as SAH.

Keywords: *Spontaneous Subarachnoid Hemorrhage; Madagascar; Management*

Introduction

In 2018, Madagascar has eleven neurosurgeons for 25,680,642 inhabitants and only two neurosurgery centers can manage people with spontaneous subarachnoid haemorrhage (SAH). Patients with SAH are relatively young and the disease can leave significant after-effects. The results presented in this study reflect the current state of medical and surgical management of spontaneous SAH in Madagas-

car. Through this series, our goal is to describe the difficulty in caring for patients with spontaneous SAH in a low-income country like Madagascar.

Patients and Methods

We conducted a multi-center retrospective study in the two Neurosurgery Services in charge of vascular neurosurgery in Antananarivo: the Neurosurgery Department of the Joseph Ravoahangy Andrianavalona University Hospital and at the Saint François d'assise Polyclinic. Over a 04-year period from January 01, 2015 to December 31, 2018, sixty-two cases of SAH were collected. For this, we included all patients hospitalized for An SAH. Therapeutics parameters such as time to diagnosis, time of management, treatment modality of aneurysm, type of surgery performed and evolutionary parameters such as surgical follow-up, complications postoperative death, overall mortality, mortality according to the mode of treatment were analyzed. These different parameters were taken into account when patients were first admitted to the ward. All data were collected from the consultation records, medical records and operating protocol book of both departments. The date of diagnosis was used to date when the patient performed a brain scan or lumbar puncture, after which the diagnosis of SAH was used. The diagnostic delay was defined by the duration between the date the patient was first seen by a physician and the date of performing a brain scan or lumbar puncture confirming the diagnosis of SAH. The management delay was defined by the duration between the date the patient was first seen by a physician and the date of admission to a specialize department.

Results

SAH accounted for 0.79% of hospitalizations with an annual frequency of 15.5 cases per year. The average age was 49.29 years with extremes of 25 and 77 years. The majority of patients, or 74.19%, were in the 40 - 59 age group. We observed a predominance of the female gender of 50 women (80.65%) compared to 12 men (19.35%) with a gender ratio of 0.24.

SAH was found in 60 patients (96.77%) brain scan. In two patients (3.23%), the diagnosis of HSA was established by lumbar puncture coupled by the "three tube" test. SAH was aneurysmal in 52 patients (83.87%) non-aneurysmal in 10 patients (16.13%). Forty-three patients had a single aneurysm (82, 69%) and nine patients (17.31%) multiple aneurysms.

The average diagnosis time was 4.09 days. Twelve patients (19.35%) only, could be diagnosed on the same day, with an extreme 16 days to make the diagnosis. The average time for management was 7.16 days, with an extreme of 21 days. Only 08 patients (12.09%) were diagnosed and admitted to a specialized ward on the same day. The average transfer time between the date the patient was seen by a physician and the date of admission to a specialized service was 3.09 days.

Regarding the treatment of aneurysmal SAH, twenty-eight patients (53.85%) were treated with surgery: aneurysm clipping with or without external ventricular bypass. Twenty patients (38.46%) had not had a safe treatment for their ruptured intracranial aneurysms. Four patients (7.69%) had endovascular treatment after being evacuated to France or India. Among patients operated on by surgery, twenty patients (71.43%) were treated with a clipping of the collar of the aneurysm without external ventricular bypass and 08 patients, or 28.57%, had a clipping of the collar coupled with an external ventricular bypass.

For the 28 patients who had surgery, sixteen patients (57.14%) had a simple surgical suite and twelve patients (42.86 per cent) have had postoperative complications. Postoperative complications are represented by external ventricular bypass system infection in 06 patients, postoperative vasospasm in 02 patients and postoperative neurological worsening in 04 patients. Eight patients (28.57%) of the 28 patients operated on had died after their operations. All four patients died as a result of infectious complications, and the other four died from worsening neurological condition.

Patients with SAH including non-aneurysmal patients had treatment in 50% for the prevention of cerebral vasospasm with nimodipine, 60% an antihypertensive, and 50% an anti-epileptic.

The mortality rate from spontaneous SAH of all types of treatment was 48.3%, or 30 out of 62 patients. The high mortality rate is mainly observed in patients who have not received a safe treatment for aneurysm (38.46%): 18 deaths out of 20 unsecured aneurysms

(90%). The 04 patients treated for endovascular treatment aneurysm scant abroad were all alive while those treated by surgery in Madagascar had 15.38% mortality. The mortality rate remains as high (40%) for non-aneurysmal HSAs (Table 1).

SAH anevrysmal				SAH non-anevrysmal		
		Staff No. 52	Percentage %		Staff No. 10	Percentage %
Surgery (clipping with or without external ventricular bypass)	Living	20	38,46	Living	06	60
	Deceased	08	15,38			
Embolisation	Living	04	7,69			
	Deceased	00	00			
Unsecured broken aneurysm (s)	Living	02	3,85	Deceased	04	40
	Deceased	18	34,62			

Table 1: *Patient mortality rate by treatment method.*

Discussion

The very long delay in diagnosis and management associated with the absence of diagnostic and therapeutic arteriography explains the very high mortality rate of patients with spontaneous SAH in Madagascar. Malmivara K., *et al*. in 2012 reported an overall mortality of 24% [1]. In Togo in 2016, Ahanogbe., *et al*. reported mortality of 22.85% [2]. In our series, the mortality rate from spontaneous HSA of all types of treatment was 48.3%, or 30 of the 62 patients.

SAH is a serious condition requiring emergency management in a specialized setting. Surgery should be performed ideally within the first 24 hours, no later than the first 3 days. Endovascular treatment also should be performed within the first 3 days with a lower mortality rate for patients treated within the first 24 hours [5]. The risk of secondary cerebral ischemia is proportional to the delay in treatment, this risk is significant after the 4th day [6]. After the average time to establish a positive diagnosis of SAH patients in our series was 4.09 days and the average time for management i.e. arrival in a specialized service was 7.16 days with an extreme of 21 days. Besides arriving in the specialized service, the patient will not necessarily be operated on the same day. This delay is mainly due to the lack of financial means of the patient's family, the failure of the health logistics for transporting the patient to the hospital, and the lack of health coverage in Madagascar.

Normally, the choice of treatment for an intracranial aneurysm should depend on the patient's age, height, location, number of aneurysm, history of SAH, anticipated difficulty of the procedure, change in size or morphology of the aneurysm, exposure of the aneurysm [7]. Endovascular treatment (risk of poor development after one year: 23.2 to 23.7%) should be preferred over surgical treatment (risk of poor development after one year: 30.6 to 33.7%) [8,9] for the treatment of aneurysmal SAH except for aneurysms associated with intra-cerebral hematomas where surgery would at the same time remove the hematoma and treat the aneurysm [10]. These results were found in our series where the 4 patients treated with endovascular treatment after medical evacuation outside Madagascar were all alive but the 28 patients treated on site by surgery had presented 28.57% of mortality and 42.86% of post-operative complications. The big problem, therefore, is the lack of structure to perform a brain angiography which is the reference diagnostic method for intracranial aneurysms [11] that would allow treaties at the same time. The most serious is that 38.46% of our patients with ruptured aneurysms were not safe with a mortality rate of 90%. The choice of how to treat the aneurysm is by default: according to the patient's financial means given the lack of a health coverage system. The cost of the two therapeutic modalities: surgical clipping or endovascular treatment is entirely at the expense of each patient.

Conclusion

SAH is a serious condition punishable by high mortality even in developed countries. This mortality rate is twice as high in Madagascar. The management of SAH requires the existence of an adequate technical platform, qualified staff and the establishment of a health

coverage system. Madagascar's socio-economic development is an indispensable factor in improving the management and vital prognosis of patients with serious and urgent conditions such as SAH.

Bibliography

1. Malmivara K., *et al*. "Health-related quality of life and cost-effectiveness of treatment in subarachnoid haemorrhage". *European Journal of Neurology* 19.11 (2012): 1455-1461.

2. Ahanogbe KM., *et al*. "Problematics of subarachnoid hemorrhage in developing countries: The case of Togo". *Acta Neurochirurgica* 62.6 (2016): 312-316.

3. Proust F., *et al*. "Severe subarachnoid haemorrhage: aneurysm occlusion". *Annales Françaises d'Anesthésie et de Réanimation* 24.7 (2005): 746-755.

4. Van Gijn J., *et al*. "Subarachnoid haemorrhage". *Lancet* 369.9558 (2007): 306-318.

5. Phillips TJ., *et al*. "Does treatment of ruptured intra-cranial aneurysms within 24 hours improve clinical outcome?" *Stroke* 42.7 (2011): 1936-1945.

6. Dorhout Mees SM., *et al*. "Timing of aneurysm treatment after subarachnoid hemorrhage: relationship with delayed cerebral ischemia and poor outcome". *Stroke* 43.8 (2012): 2126-2129.

7. Audiberta G., *et al*. "Subarachnoid haemorrhage: epidemiology, predisposition, clinical presentation It's not going Subarachnoid haemorrhage: epidemiology, genomic, clinical presentation". *Annales Françaises d'Anesthésie et de Réanimation* 26.11 (2007): 943-947.

8. Molyneux A., *et al*. "Inter-national Subarachnoid Aneurysm Trial (ISAT) of neurosurgical clipping versus endovascular coiling in 2143 patients with ruptured intra-cranial aneurysms: a randomised trial". *Lancet* 360.9342 (2002): 1267-1274.

9. McDougall CG., *et al*. "The Barrow Ruptured Aneurysm Trial". *Journal of Neurosurgery* 116.1 (2012): 135-144.

10. Connolly Jr ES., *et al*. "Guidelines for the management of aneurysmal subarachnoid hemorrhage: a guideline for healthcare professionals from the American Heart Association/American Stroke Association". *Stroke* 43.6 (2012): 1711-1737.

11. Romijn M., *et al*. "Diagnostic accuracy of CT angiography with matched mask bone elimination for detection of intracranial aneurysms: comparison with digital subtraction angiography and 3D rotational angiography". *American Journal of Neuroradiology* 29.1 (2008): 134-139.

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