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Prognostic Factors Associated with Aortic Dissection at the Cardiac Intensive Care Unit of the Point "G" Hospital University Center, Bamako, Mali

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Abstract

Objective: The purpose of this study was to describe the prognostic factors associated with aortic dissection with the cardiology intensive care unit of the Point "G" Hospital University Center. **Methodology:** This was a descriptive transversal study from January 2010 to February 2017 that included all inpatients during this period. **Results:** Of 6912 patients admitted, 23 patients were admitted for an aortic dissection, a frequency of 0.33%. Of these, (6) six were under age 50 (26.1%) and the majority age group was 50 - 69 years old. Cardiovascular risk factors were high blood pressure, smoking, and diabetes with 73.9%, 60% and 13% of cases, respectively. At the clinic, chest pain and dyspnea were the main symptoms with respectively 65.2% and 52.2% and with 56.5% asphygmy was associated with pain. Para-clinically, renal failure and anemia were the major laboratory abnormalities found with respectively 43.75% and 31.25% of cases. Doppler echocardiography revealed lesions associated with aortic dissection. In the thoracic angioscan, the aortic dissection was type A (43.5%) and 56.5% type B. The co-morbidities, the associated lesions and the hemodynamic state of the patient indicate the degree of urgency. The treatment was medical. The evolution was full of complications with 52.2% of deaths including 7 (seven) type A patients. Intra-hospital death was

26.1%. Other complications were heart failure (47.8%), the renal failure (43.75%) and an aortic aneurysm (34.8%). **Conclusion:** Aortic dissection is a life-threatening medical and surgical emergency.

Keywords

Aortic Dissection, Pronostics, Bamako

1. Introduction

Aortic dissection is secondary to an intimal tear that results in intimomedial detachment and the creation of a true and a false channel within the aortic lumen [1] [2]. Its prevalence in Europe is 0.5 - 5/100,000 inhabitants/year [3] and 0.03% on the Asian Continent in Taiwan [4]. In Africa, its incidence is estimated at 0.24% in Senegal [5]. In Mali according to a study by Cisse [6], dissection of the aorta had a hospital frequency of 0.039% at the Mère-Enfant Hospital "Luxembourg". The absence of recent epidemiological data and the increasing lethality of the aortic dissection justify this study to describe the prognostic factors associated with aortic dissection in the Cardiac Intensive Care Unit in the CHU Point "G" Bamako-Mali.

2. Material and Methods

There was a descriptive study from January 2010 to February 2017 that included all hospitalized patients, meeting our eligibility criteria during this period.

The inclusion criteria were concerned patients of both sexes hospitalized or followed in the cardiology intensive care unit of the Point "G" Hospital University Center, for aortic dissection. We're not concerned by the survey the patients who were suspected to be submitted the aortic dissection; were suspicions of aortic dissection not benefiting from chest angiography and other causes of thoracic pain syndrome.

The judgment criteria were:

- The presence of a symptomatology evoking an aortic dissection.
- The confirmation of the aortic dissection was made by the thoracic angioscanner.
- The chest angiography by highlighting signs in favor of aortic dissection.
- The presence of cardiovascular risk factors and associated comorbidities.
- The classification used was that of Stanford.
- The treatment was medical due to lack of technical platform.

Definition of terms

Aortic dissection is a longitudinal cleavage of the aortic media with creation of a false channel from an intimal tear and bursting of blood into this aortic neo light, the two aortic lumens being separated by the intimal membrane.

- HTA is defined as office systolic blood pressure values ≥ 140 mmHg and/or

diastolic blood pressure values ≥ 90 mmHg.

- Aortic insufficiency is defined by a reflux of blood from the aorta to the left ventricle related to aortic sigmoid incontinence.

Stanford Classification:

Type A: affecting the ascending aorta

Type B: affecting the descending aorta

3. Results

Of 6912 patients admitted, 23 patients were admitted for an aortic dissection, a frequency of 0.33%. Of these, (6) six were under age 50, or 26.1%. The majority age group was 50 - 69 years old (Table 1). The predominance was male, 82.6% which makes a sex ratio of 4.75. The age group 50 - 69 (47.4%) was the most affected for men, while for women it was 70 - 84 (50%). Cardiovascular risk factors were high blood pressure, smoking, and diabetes with 73.9%, 60% and 13% of cases, respectively (Table 2). At the clinic, chest pain, dyspnea and cough were the main symptoms with 65.2%, 52.2% and 26.1% of cases, respectively (Table 3). Asphygmy, 56.5% and de novo 60.9% aortic insufficiency breath were the main signs of physical examination (Table 4). Para-clinically, renal failure and anemia were the major laboratory abnormalities found with respectively 43.75% and 31.25% of cases. The electrocardiogram was predominantly sinus tachycardia in 86.9%, left ventricular hypertrophy in 30.4%. X-rays of the frontal thorax showed mediastinal enlargement with 73.9%, cardiomegaly, 52.2% of cases and a progression of the wall of the aorta 38% of cases. Doppler echocardiography showed dilatation of the ascending aorta 73.9%, intimal veil with 47.8% and aortic insufficiency with 60.9% of cases (Table 5). In chest CT angiography, the aortic dissection was with 43.5% type A and 56.5% type B. The extension of the dissection was to the iliac arteries with 21.7% and renal 17.7% (Table 6). The co-morbidities, associated lesions and hemodynamic status of the patient indicated the degree of urgency. The treatment was medical malpractice technical plateau in Mali. The evolution was full of complications with 52.2% of deaths (12 patients) of which 7 (seven) type A patients was 70% of type A lethality (Table 7). This lethality was eleven (11) men and one (1) female. Intra-hospital death was 26.1%. Only 5 (five) patients out of 13 type B had died (Table 8). Other complications were heart failure (47.8%), the renal failure (43.75%) and the aortic aneurysm (34.8%).

Table 1. Distribution of patients according to sex and age.

Sex/Age	30 - 49	50 - 69	70 - 84
Male	5	9	5
Female	1	1	2
Numbers	6	10	7
Percentage	26.1%	43.5%	30.4%

Table 2. Distribution of patients according to cardiovascular risk factors.

Functional sign	Numbers	Percentage
Arterial hypertension	17	73.9%
Smoking	14	60.9%
Diabetes	4	17.4%
Menopause	3	13%
Obesity	3	13%
Dyslipidemia	2	8.7%

Table 3. Distribution of patients according to functional signs.

Functional sign	Numbers	Percentage
Chest pain	15	65.2%
Abdominal	3	13%
Dyspnea	12	52.2%
Cough	6	26.1%
Hepatic stress	5	21.7%
Fear of heights	1	4.3%

Table 4. Distribution of patients according to physical signs.

Complications	Numbers	Percentage
Breath of IAo	14	60.9%
Asphygmy	13	56.5%
Hepatology	6	26.1%
Tachycardia	6	26.1%
Edema of the lower limbs	5	21.7%
Pulmonary carpers	4	17.4%
Gallop B3	3	13%

Table 5. Distribution of patients according to echocardiographic abnormalities.

Echocardiographic abnormalities	Numbers	Percentage
Dilation of the ascending aorta	17	73.9%
Aortic insufficiency	14	60.9%
Intimate veil	11	47.8%
Pericardial effusion	6	26.1%
Segmental kinetic disorder	5	21.7%
Thrombus intra-channel	2	8.7%

Table 6. Distribution of patients by results of thoracic angioscan.

Result of the thoracic angioscan		Numbers	Percentage
Siege of the dissection	Type A	10	43.5%
	Type B	13	56.5%
False channel		11	47.8%

Continued

Aneurysm	Abdominal aorta	5	21.7%
	Ascending Aorta	3	13%
	Descending aorta	2	8.7%
Extension of the dissection	Iliac	5	21.7%
	Renal	4	17.4%
	Inferior member	1	4.3%

Table 7. Distribution of patients according to evolution.

Type	Favorable	unfavorable	Death
	Without complications	With complications	
A	1	2	7
B	2	6	5
Total	**3**	**8**	**12**

Table 8. distribution of deaths by period of hospitalization.

Dearth	Numbers	Percentage
Intra-hospital	6	26.1%
During re-hospitalization	2	8.7%
Extra-hospital	4	17.4%
Total	12	52.2%

4. Discussion

During the study period, out of 6912 inpatients in the cardiology intensive care unit, 23 patients were for aortic dissection or a prevalence of 0.33% of cardiac admissions. Our rate was close to 0.24% of DIAO [5] but much higher than that of 0.039% of Cissé [6]. This difference could be explained by the presence of a cardiac intensive care unit at the Point G hospital where cardiac emergencies in Bamako are referred for better management.

*Age: only (6) six patients were aged under 50 years or 26.1% against 73.9% over 50 years with an extreme of 83 years. From this we deduce that aortic dissection increases with age according to the data of the literature [5] [6].

*Sex: The predominance was male 82.6%, with a sex ratio of 4.75 with agreement with the literature.

*HTA: The preeminence of the arterial hypertension with the personal antecedents was classic with 60% in our series. Its pathogenic role is described in the literature [7].

*Hypertension, smoking and diabetes were the most common cardiovascular risk factors, with a crucial role in the genesis of parietal anomalies and increased parietal stress.

The main functional signs were chest pain with 65.2% and dyspnea with

52.2%. We conclude that these signs should prompt us to pay more attention to the search for an aortic dissection especially in hypertensive patients with de novo aortic insufficiency and asphygmy on physical examination. The mediastinal widening was the major radiological sign with 73.9% with agreement with the data 94% of F. A. Kouassi [7] and 73.9% of Diallo [6]. The electrocardiogram recorded sinus tachycardia with 86.9%, left ventricular hypertrophy, related to arterial hypertension. About 20% of patients with dissection involving the ascending aorta showed evidence of acute myocardial ischemia secondary to poorly perfused coronary artery disease due to dissection or tearing of the coronary ostium most often right [8]. Doppler echocardiography revealed lesions associated with aortic dissection by dilatation of the ascending aorta and pericardial effusion reflecting a pre-fissure condition of the ascending aorta in agreement with literature data [9] [10]. The aortic insufficiency was objectified in 60.9% secondary to the retrograde extension of the dissection up to the aortic ring and prolapse of the sigmoid.

According to the Stanford classification, type A was 43.5%. The double channel was visualized with 47.8% of cases and the extension of this dissection was to the iliac arteries with 21.7% and renal with 17.4%. Symptoms suggestive of poor perfusion syndrome should be recognized for emergency treatment. The rupture of the aorta can be done with the pericardium or the pleural cavity causing sometimes a diagnostic delay [11] [12]. Abdominal aortic aneurysm [13], heart failure, renal failure and anemia were long-term prognostic factors.

The treatment was medical in the absence of cardiovascular surgery unit in Bamako and the indigence of the patient can't bear the costs of evacuation to a more equipped center. Beta blockers and calcium channel blockers were the most used therapeutic classes in agreement with the rest of the literature [2] [3] [4] [5].

We recorded 12 deaths with a lethality of 52.2% of which 7 (seven) patients type A is 70%. Only 5 (five) out of 13 type B patients died. Classically, the prognosis of aortic dissection is formidable with a high mortality reaching 70% in the first week [14] [15] [16]. This high mortality rate in our study could be explained by the delay in admission, the lack of a cardiovascular surgery unit in Bamako and the cost of evacuation to a more equipped center.

5. Conclusion

Aortic dissection is a short-term life-threatening medical and surgical emergency. Hospital mortality in a specialized cardiac environment in Bamako is very high. The deceased were relatively old and at home type A was dominant. The reduction of this morbidity and mortality goes through the prevention of cardiovascular risk factors and the equipment of our cardiovascular surgery services for the management of surgical forms.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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