

Papillary Edema As a Predictive Sign of Major General Complications of Arterial Hypertension

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Abstract

Introduction: High blood pressure is one of the leading causes of premature death due to its cardiac, renal and neurological disorders.

Objective: To evaluate the relationship between hypertensive retinopathy and the prevalence of potential life-threatening complications.

Materials and Methods: Cohort study comparing two groups (G1 and G2) of 13 patients each, performed over a period of 5 years at the University Hospital of Brazzaville. Patients with essential hypertension complicated by stage II and III retinopathy of the Kirkendall's classification were included. Each patient was seen 3 times over a period of 9 months. G1 were in stage III and G2 in stage II. The factors compared were: prevalence of heart failure, renal failure and stroke, as well as the mortality rate. The relative risk, the Student's test with a threshold of significance less than 0.05 were the statistical tests used.

Results: Prevalence of heart failure, renal failure and stroke were respectively: 53.85% G1 vs 15.38% G2 ($p < 0.05$), 38.46% G1 vs 7.69% G2 ($p < 0.05$) and 30.77% G1 vs 0.00% G2 ($p < 0.05$). These complications were associated in 61.54% G1 vs 23.07% G2. The mortality rate was: 84.61% G1 vs 7.69% G2 ($p < 0.05$).

Conclusion: Stage III hypertensive retinopathy is associated with a high prevalence of severe general complications of high blood pressure.

Keywords: Heart failure, High blood pressure, Papillary edema, Renal insufficiency, Stroke

Introduction

High blood pressure (HBP) is a public health problem responsible for nearly 8 millions deaths a year. These deaths are mainly due to heart disease, nephropathy and stroke [1]. WHO estimates that the prevalence of hypertension in the African region is about 46%. This prevalence is still higher than in other regions of the world (seen this 24/07/2018 : <http://www.emro.who.int/fr/media/world-health-day/public-health-problem-factsheet-2013.html>). In the developed countries some explorations (Angio-MRI, Echo-Doppler ...) help in the prognosis of HBP. The situation is very different in Africa where the lack of materials remains a real obstacle. Under these conditions careful clinical examination is of paramount importance.

The objective of this work was to evaluate the relationship between the evolutionary stage of hypertensive retinopathy and the prevalence of serious and life-threatening general complications.

Materials and Methods

It was a cohort study conducted over a period of five years (January 2012 - December 2016) in the Ophthalmology department of the University Hospital of Brazzaville. It compared two groups (G1 and G2). G1 and G2 had 13 patients each. Patients had HBP complicated with stage III (G1) and II (G2) hypertensive retinopathy according to Kirkendall's classification. All patients were followed regularly for at least five years by the same cardiologist with at least four annual controls. They had been seen 3 times by the same Ophthalmologist for a period of nine months. The diagnosis of hypertensive retinopathy was made using the Super Field magnifier

and the slit lamp in a patient with dilated pupil. Inclusion criteria were: patient agreement, majority (18 years minimum), essential hypertension, no comorbidity, no other treatment apart from HBP. Patients who had changed from II to III or III to II stage during the 9 months were excluded. The factors analyzed in the 2 groups were: the prevalence of heart failure (HF), of renal insufficiency (RI), of stroke and the mortality rate. The diagnosis of HF, RI and stroke was made by reading the respective follow-up reports in cardiology, nephrology and neurology. The relative risk (RR) and its 95% confidence interval (95% CI), the Student's test (t) with a threshold of significance (p) less than 0.05 were used.

Results

The mean age was 44 ± 2.5 years [29 years - 54 years] G1 vs 38 ± 3.5 years [35 years - 55 years] G2 ($p = 0.3$). The sex ratio was 1.16 G1 vs 0.86 G2. Table 1 shows the prevalence of HF. Table 2 shows the prevalence of RI. Table 3 shows the prevalence of stroke. These complications were associated in 61.54% G1 vs 23.07% G2. The mortality rate was 84.61% G1 vs 7.69% G2 ($p < 0.05$).

Table 1: Prevalence of heart failure in patients with hypertensive retinopathy stage III (G1) and II (G2) Kirkendall's classification, between January 2012 and December 2016, in the Ophthalmology department at the University Hospital of Brazzaville (Congo)

	Presence of heart failure	Absence of heart failure
G1	53.85%	46.15%
G2	15.38%	84.62%
RR	0.67	0.58
t[95% IC]	3.20 [2.40 – 4.50]	2.80 [3.00 – 5.10]
p	< 0.05	< 0.05

RR = Relative risk

t = Student's test

p = threshold of significance

CI = Confidence interval

Table 2: Prevalence of renal insufficiency in patients with hypertensive retinopathy stage III (G1) and II (G2) Kirkendall's classification, between January 2012 and December 2016, in the Ophthalmology department at the University Hospital of Brazzaville (Congo)

	Presence of renal insufficiency	Absence of renal insufficiency
G1	38.46%	61.54%
G2	7.69%	92.31%
RR	2.30	3.10
t[95%IC]	4.10 [3.90 – 5.70]	3.70 [2.90 – 4.80]
p	< 0.05	< 0.05

RR = Relative risk

t = Student's test

p = threshold of significance

CI = Confidence interval

Table 3: Prevalence of stroke in patients with hypertensive retinopathy stage III (G1) and II (G2) Kirkendall's classification, between January 2012 and December 2016, in the Ophthalmology department at the University Hospital of Brazzaville (Congo)

	Presence of stroke	Absence of stroke
G1	30.77%	69.23%
G2	0.00%	100.00%
RR	5.30	4.10
t[95%IC]	6.10 [4.90 – 7.70]	5.70 [3.90 – 7.80]
p	< 0.05	< 0.05

RR = Relative risk

t = Student's test

p = threshold of significance

CI = Confidence interval

Discussion

Two main weak points can be blamed for this work. The small sample size and the short observation time of the patients. For the patient the acceptance to participate in a survey is often difficult, especially when no therapeutic benefit is expected. This is an even more difficult obstacle to overcome in our context of endemic poverty when the patient has to travel at his own expense to come to consultations. A large sample size assumes that there were significant human and financial resources to conduct the survey. Despite our requests, we had no help. The rigor in the constitution of the two groups nevertheless allows to have an acceptable evolutionary tendency of the links between the hypertensive retinopathy and the general complications of the high blood pressure.

Our investigation showed that there was a statistically significant correlation between retinal manifestations of hypertension and general complications. Stage III of the Kirkendall's Classification predisposes to severe and fatal general complications (seen this 25/11/2018 : http://www.sfo.asso.fr/files/files/09_HTA_15sept08%5B1%5D.pdf). This stage was also linked to a very high mortality rate. This result is compatible with the data from the literature [2-4]. The mechanisms leading to these complications are complex and generally associated. The dilatation of small fragile vessels such as capillaries under blood pressure is the most cited. Authors have shown that there is a link between the average blood platelet count and the progressive stage of hypertensive retinopathy [5]. The progression of retinopathy is parallel to the level of platelets. This mechanism contributes in part to predispose hypertensive patients to a high risk of thromboembolism. The Wong-Mitchell classification provides an interesting summary of the link between the evolutionary stage of hypertensive retinopathy and serious general complications [2].

Conclusion

Stage III of hypertensive retinopathy (Kirkendall's classification) is associated with a high prevalence of major general complications. In underdeveloped countries careful clinical examination remains important. The Ophthalmologist should inform the Cardiologist, Neurologist and Nephrologist about potential risks related to the patient's condition after the fundus.

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