Research Article

Compliance of hypertensive patients with antihypertensive drug therapy at the Renaissance Hospital of N'Djamena, Chad

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Abstract

Introduction: High blood pressure is a major cardiovascular risk factor. In hypertension, non-compliance is frequent. The objective of this work is to evaluate the therapeutic observances and to identify the predictive factors of poor compliances in Chadian hypertensive patients.

Patients and Methods: It was a prospective cross-sectional study over a six-month period from January 15 to July 15, 2019. This was performed in the outpatient Cardiology and Nephrology units at the Renaissance Hospital of N'Djamena. We included all follow-up patients who had hypertension who consulted during the study period. However, dialysis patients and children were excluded from this study. The parameters studied were demographic characteristics, economic and therapeutic data and the rate of therapeutic compliance.

Results: Eighty-seven patients were included. The average age was 50 years old. The sex ratio was 2.5. Sixty-seven percent (n = 58) of the patients were from urban areas. The predominant cardiovascular risk factors were smoking in 25% (n = 22) and diabetes in 23% (n = 20). Hypertension was uncontrolled in 76% (n = 66) patients. Adherence was poor in 66% (n = 57) of patients. The monthly cost of treatment was respectively 10,000 and 20,000 FCFA in 52% (n = 45) of cases. Combination therapy was observed in 70% of cases (n = 61) and 56% (n = 49) of patients had more than one drug intake. The adherence rate was 93% (n = 28) in the urban population ($p < 0.001$). All patients (n = 30) who were observing their treatment were educated ($p < 0.001$). The adherence rate was 20% (n = 6) in patients who had a monthly income less than 100,000 FCFA ($p = 0.004$). The adherence rate was 60% (n = 18) when the monthly cost was less than FCFA 10,000 ($p = 0.003$). The adherence rate was 77% (n = 23) in patients receiving monotherapy ($p < 0.001$).

Conclusion: This study showed a low level of adherence in Chadian hypertensive patients. The complexity and cost of antihypertensive therapy, poor knowledge of hypertension, and ignorance of its severity have been the main factors of poor compliance.

Introduction

High blood pressure is a major cardiovascular risk factor. It concerns more than 50% of the French population over 50 years of age [1]. Therapeutic compliance is a complex phenomenon and many authors have described various barriers to adherence that have been classified in five dimensions by the World Health Organization: social/economic, health system related, disease related, related to the treatment or to the patient [2,3]. In hypertensive patients, therapeutic compliance is defined by the patient's ability to comply with antihypertensive treatment and associated non-drug measures. This ability is influenced positively or negatively by emotional, behavioral and social factors that interact with each other [4,5]. Chronic diseases requiring long-term treatment with many life-behavior changes that are associated with poor treatment adherence leading to deleterious effects for both the patient and the community.

Numerous studies have shown that compliance with treatment is significantly correlated with patient prognosis and that the lack of compliance increases the risk of death from cardiovascular diseases [6-8]. Despite increasing therapeutic possibilities, less than half of the subjects treated have a balanced hypertension [9]. In Chad, Hypertension seems to be common. However, we do not have quantitative data on this pathology or on the degree of compliance of treated patients. The objective of this work is to evaluate the level of adherence and identify the factors predicting poor compliance in Chadian patients.

Patients and Methods

This was a prospective cross-sectional study over a six-month period (6) from January 15 to July 15, 2019. It was performed in the outpatient Cardiology and Nephrology units at the Renaissance Hospital of N'Djamena. All patients on follow-up for hypertension who consulted during the study period and who agreed to participate were included. However, dialysis patients and children were excluded. To evaluate adherence, we used the test developed and validated by Girerd, et al. [10], with six questions to which the patient must answer yes or no (Table 1). To study the factors predicting poor adherence, patients were divided into two groups: poor observers (total of yes ≥ 3) and good observers (total of yes < 3).

The parameters studied:

- Characteristics of the population:

Demographic: Age, sex, occupation, educational level, origin (urban, rural).

Cardiovascular risk factors: Diabetes (blood glucose level ≥ 1.26 g/l). Dyslipidemia (high LDL cholesterol > 1.50 g/l, hypertriglyceridemia > 2 g/l, Low HDL cholesterol level < 0.4 g/l in men and < 0.5 g/l in women). Obesity (body mass index ≥ 30 mg/kg^2 or waist circumference > 94 cm in men). Alcohol (consumption beyond 2 glasses (20 g of pure alcohol)) per day. Smoking (current or stopped for less than three years). Chronic renal dysfunction with glomerular filtration rate < 60 ml/min/1.73 m^2.

Table 1: Compliance Evaluation Test.		
Questions	**Yes**	**No**
1. This morning did you forget to take your medication?		
2. Since the last consultation, was your medication enough for your daily required intake?		
3. Have you ever taken your treatment before the usual time?		
4. Have you ever missed your treatment because some days you forget?		
5. Did you ever not take your treatment because some days you feel that your treatment does you more harm than good?		
6. Do you think you have too many tablets to take in a day?		
Test interpretation • Total YES = 0 Good compliance • Total YES = 1 or 2 Minimal compliance problem • Total YES ≥ 3 Poor compliance		

- **Economic and therapeutic data:** monthly income, monthly cost of treatment, health insurance, number of therapies, number of drug intake per day, knowledge of the disease, access to the doctor. The monthly income was expressed in CFA francs (1 US dollar = 594 CFA francs).

Comorbidity: Hypertension is defined as a persistent rise in arterial blood pressure, measured in the office, systolic blood pressure ≥ 140 and/or diastolic blood pressure ≥ 90 mmHg [11]. High blood pressure is controlled under treatment and the blood pressure is < 140/90 mmHg in all except diabetic and renal dysfunctional patients where the threshold is < 130/80 mmHg. In our patients, we used two methods for follow-up, namely ambulatory measurement for patients who had the means and self-measurement for those who did.

Ethics

This work was done after the approval of the hospital's management department and the consent of the patients.

Statistics

The data obtained had been analyzed by SPSS 10.0 software. The results were expressed as mean ± standard deviation, percentages and tabulated. To compare the results, the proportional test for the relative risk calculation and the Chi square test (X^2) were used. The threshold of significance was set at $p < 0.05$.

Results

During the period of our study, 87 patients were included. The average age was 50 years old with extremes of 27 and 71 years old. The sex ratio was 2.5. 67% (n = 58) of the patients were from urban areas. The education rate was 69% (n = 60), half of whom had a higher level. The most common cardiovascular risk factors were smoking in 25% (n = 22), diabetes in 23% (n = 20) and obesity in 16% (n = 14). Hypertension was controlled in 24% (n = 21) of patients and uncontrolled in 76% (n = 66) of patients. The level of compliance was good in 34% (n = 30) of patients and poor in 66% (n = 57) of patients. Table 2 shows the characteristics of the patients.

Economic and Therapeutic Data of Patients (Table 3)

Forty one percent (n = 36) of patients had a monthly income of less than CFAF 100,000 and only 17% (n = 15) had health insurances. 70% (n = 61) of the patients had combination therapy with a monthly treatment cost of between 10,000 and 20,000 FCFA in the majority of cases (52%, n = 45). The use of traditional treatment was found in 68% (n = 59) of the cases; 80% (n = 70) of the patients did not know their disease and 94% (n = 82) of the patients had difficulty getting access to a physician.

Table 2: Characteristics of the Study Population.

Data	N (%)
Sex	
Woman	25 (29)
Man	62 (71)
Age (annual)	
Average	50
< 30	1 (1)
30 - 39	12 (14)
40 - 49	27 (31)
50 - 59	39 (45)
≥ 60	8 (9)
Origin	
Urban	58 (67)
Rural	29 (33)
Employed	55 (63)
Unemployed	32 (37)
Level of Education	
Unschooled	27 (31)
Primary	12 (14)
Secondary	17 (19)
Superior	31 (36)
Risk Factors	
Obesity	14 (16)
Diabetes	20 (23)
Dyslipidemia	9 (10)
Alcohol	7 (8)
Smoking	22 (25)
Renal Dysfunction	11 (13)
Control of Hypertension	
Yes	21 (24)
No	66 (76)
Level of Compliance	
Good	30 (34)
Bad	57 (66)

Table 3: Economic and Therapeutic Data of Patients.

Data	N (%)
Monthly Income (FCFA)	
< 100 000	36 (41)
100 000 - 200 000	27 (31)
> 200 000	24 (28)
Monthly Cost of Processing (FCFA)	
< 10 000	23 (26)
10 000 − 20 000	45 (52)
> 20 000	19 (22)
Health Insurance	
Yes	15 (17)
No	72 (83)
Number of Medications Prescribed per day	
Monotherapy	26 (30)
Double Therapy	37 (43)
Triple Therapy or more	24 (27)
Number of Drug Intake in a day	
1 time	38 (44)
2 times	39 (45)
≥ 3 times	10 (11)
Knowledge of the Disease	
Yes	17 (20)
No	70 (80)
Use of Traditional Treatment	
Yes	59 (68)
No	28 (32)
Access to a Physician	
Easy	5 (6)
Difficult	82 (94)

Factors influencing therapeutic compliance (Table 4)

The adherence rate was 93% (n = 28) in the urban population (p < 0.001). All patients (30/30) who were observing their treatment were educated. The adherence

Table 4: Factors Influencing Therapeutic Compliance.

Data	Level Comliance		p
	Good N (%)	Bad N (%)	
Origin			
Urban	28 (48)	30 (52)	< 0,001
Rural	2 (7)	27 (93)	
Monthly Income (FCFA)			
< 100,000	6 (17)	30 (83)	0,004
> 200,000	13 (54)	11 (46)	
Monthly Cost of Processing (FCFA)			
< 10,000	18 (78)	5 (22)	
10,000 − 20,000	7 (16)	38 (84)	0,003
> 20,000	5 (26)	14 (74)	
Health Insurance			
Yes	14 (93)	1 (7)	< 0,001
No	16 (22)	56 (78)	
Combination Therapy			
Yes	7 (11)	54 (89)	< 0,001
No	23 (88)	3 (12)	
Number of Drug Intake per day			
1 time	16 (42)	22 (58)	0,002
≥ 2 times	14 (29)	35 (71)	
Knowledge of the Disease			
Yes	9 (53)	8 (47)	0,4
No	21 (30)	49 (70)	
Comorbidity			
Yes	22 (76)	7 (24)	0,002
No	8 (14)	50 (86)	

rate was 17% (6/36) in patients who had a monthly income less than 100,000 FCFA and 54% (13/24) in those who had an income above 200,000 FCFA (p = 0.004). The adherence rate was 78% (18/23) when the monthly cost was less than 10,000 FCFA and 26% (5/19) when it was greater than 20,000 FCFA (p = 0.003). The adherence rate was 93% (14/15) in health insured patients, 88% (23/26) in patients receiving monotherapy, 11% (7/61) in those receiving combination therapy (p < 0.001) and 29% (14/49) in patients who had more than one drug intake per day (p = 0.002). The rate of poor compliance was 70% (49/70) in patients who did not know their disease (p = 0.4) and 86% (50/58) in patients who did not have comorbidity rate (p = 0.002).

Discussion

In this study, the rate of poor compliance was high (66%). The main factors in this poor compliance were the cost of treatment associated with the lack of health coverage, the complexity of treatment, and the lack of patient awareness of the disease and treatment. The frequency of poor compliance remains variable in treated hypertensive patients. Several studies have evaluated it [12,13]. Similar results are found in the literature. Konin, et al. In Ivory Coast [14], and Ghozzi, et al., in Tunisia [15], found in hypertensive patients 87.5% and 63.4%, respectively, poor compliance. Other authors have reported results with significantly lower rates. Ikama Méo, et al., in the Republic of Congo [16] and Gallup, et al. [17], found a rate of poor compliance of 32.5% and 46%, respectively. This variability of data is related among other things to the difference in measurement methods, health systems, sampling and duration of follow-ups.

Factors associated with poor adherence

In our series, nearly all patients from rural areas had poor compliance (93%). Patients who lived in cities had a much better adherence rate. This may be related to access to the doctor which is more or less easy in the city in our context. Purchasing power and accessibility to treatment play an important role in adherence. In fact, the income in our study population was low (41%) with a monthly income of less than 100,000 FCFA, the adherence rate was low (17%) in this category of patients ($p = 0.004$). The majority of our patients did not have health insurance and the cost of monthly treatment was relatively high ($\geq$ 10000 FCFA) in relation to income. This could explain the low compliance rate observed in this population. Adoubi, et al. [18], in Côte d'Ivoire, showed that the absence of health insurance was a risk factor for poor compliance, in a study where nearly half of the subjects (49.4%) had social security. These results show that to have a high rate of adherence, it is necessary to increase the purchasing power of populations, reduce the overall monthly cost of antihypertensive treatment, and generalize health insurance with respect to low monthly income. In the majority of our patients, the complexity of the treatment can negatively influence adherence. Thus, we found high rates of poor compliance in patients who were on combination therapy (89%) and those who had at least two (2) doses per day. These data show that the more patients who received combination therapy with several drug doses per day, the less observant they were. According to Girerd X, et al. [10], combinations of cardiovascular risk factors require patients to comply with up to ten prescription lines, thus reducing adherence. Machihude Pio, et al. [19], found, 94.12% and 67.39% of patients who had respectively three or more tablets per day were poor observers; 76% and 58.16% of those who had three and two shots per day were also poor observers. C Konin, et al. [14], found 77.3% of patients with more than three tablets a day and 95.3% of those who had three daily doses are worse observers. In a population of 105 hypertensive patients, Eisen, et al. [20], showed that the average adherence was 59% for antihypertensive treatment administered in three doses and 83.6% for a daily dose administered daily. Knowledge of its treatment and complications of hypertension and the perception of its severity are factors that can positively influence compliance. Girerd, et al. [10], have highlighted the relationship between poor compliance and poor knowledge of antihypertensive therapy that we did not find in our study. Several patient education programs on the disease and treatment goals have demonstrated their influence on improving adherence, especially when they incorporate sociology and lifestyle concepts [21]. Better education could improve adherence to treatment, including diet and lifestyle measures, and reduce the cost of medical care. Studies have shown that, at different times, a good knowledge of hypertensive disease and medications was predictive of better adherence and better control of blood pressure [22,23]. Comorbidity can have a positive effect on adherence. The presence of diabetes mellitus or dyslipidemia improved adherence, whereas conversely, depression was associated with poor compliance [24]. The data in our study are in the same direction with a compliance rate of 76% in patients with co-morbidities. In view of these data, efforts still need to be made to improve therapeutic compliance, in particular on improving the doctor-patient relationship, on patient education and on the simplification of treatment and its accessibility.

Limitations of our work

Our study presents several methodological limitations. The data was collected on the basis of a questionnaire from which certain answers for example, on the consumption of alcohol and/or the monthly income could be biased. Therefore, some parameters could be underestimated because of the short duration of the study. The relationship between different therapeutic classes and poor compliance has not been investigated and the psychological dimension that seems important in this type of study has not been studied. The size of our sample is small, therefore, we would have to lead with more representative studies in the future, along with a longer duration of follow-up to better assess the observance in our population.

Conclusion

This study showed a low level of therapeutic compliance in Chadian hypertensive patients. The complexity and cost of antihypertensive treatment, poor knowledge of hypertension and lack of knowledge of its severity have been the main factors of poor compliance.

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