ORIGINAL ARTICLE

Adherence to antihypertensive treatment among haemodialysis patients in the Yalgado Ouédraogo University Hospital, Ouagadougou, Burkina Faso: a cross-sectional survey

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ABSTRACT

Background: Hypertension prevails among haemodialysis patients, and its management is affected by fluid overload as well as patients' adherence to medication and non-medication interventions. This study assessed the adherence to hypertensive medication by haemodialysis patients at the Yalgado Ouédraogo University Hospital in Ouagadougou, the first of its kind conducted in Burkina Faso.

Patients and Method: Face-to-face interviews were conducted to record haemodialysis patients with hypertension. The Girerd et al. compliance evaluation toolkit was used to assess therapeutic adherence. Patients were classified as observing poor or good adherence, based on whether they had three or more, or fewer than three, "yes" responses, respectively. The data were analysed using Stata software version 16. Descriptive statistics are presented as counts, percentage means, or medians.

Results: The median age of the study sample of 75 haemodialysis patients was 44 years, and their median time on haemodialysis was 36 months. The median monthly estimated cost of antihypertensive drugs purchased per patient was US$ 25. Poor adherence was observed in 65 patients (illustrating minimal adherence problems and poor adherence). Reasons for poor adherence included the high cost of antihypertensive drugs, forgetfulness, and complex dosing regimens, cited by 45, 39, and 23 patients, respectively.

Conclusion: The study revealed a high prevalence of poor adherence to antihypertensive treatment among the haemodialysis patients. This was attributed to unfavourable socio-economic conditions and the lack of universal health insurance.

Keywords: hypertension; treatment; adherence; haemodialysis; sub-Saharan Africa; Burkina Faso.

INTRODUCTION

Hypertension is common in haemodialysis patients, with a prevalence of greater than 80% [1-3]. However, controlling hypertension in these patients remains a challenge. The condition of more than half of haemodialysis patients treated for hypertension is not well controlled [2,3], and their hypertension is generally associated with a high risk of cardiovascular events and mortality [4,5]. Elevated blood pressure at home or in an outpatient setting is linked to mortality in haemodialysis [6,7].

Several factors contribute to hypertension in haemodialysis patients, including fluid overload, arterial stiffness, activation of the sympathetic nervous system and the renin–angiotensin–aldosterone system, endothelial dysfunction, and erythropoiesis-stimulating agents [8]. Apart

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from these factors, good adherence to treatment also influences blood pressure control. Adherence to antihypertensive therapy is a modifiable and an inexpensive means of improving blood pressure control in haemodialysis patients and avoiding associated complications [9]. In high-income countries, health insurance covers the treatment of hypertension. However, patients in low-income nations like Burkina Faso must pay for this treatment. Therefore, patients' economic status could significantly influence adherence to antihypertensive therapy in poor countries. We report here the assessment of adherence to pharmacological treatment for hypertension by haemodialysis patients at the Yalgado Ouédraogo (YO) University Hospital, in a cross-sectional survey.

Methods

We surveyed haemodialysis patients at the haemodialysis centre of YO University Hospital (YO UHC), Ouagadougou, from 1 September to 1 October 2019. The study included chronic kidney disease (CKD) stage 5 patients, who had been receiving haemodialysis for more than three months and experienced hypertension, as reported in their medical records. At the time of the study, most patients at the centre received dialysis for four hours twice a week. The government subsidised the purchase of dialysis consumables, but other treatments, biological tests, and transport were the responsibility of the patients and their families. Therapeutic adherence was assessed using the Girerd et al. (2001) compliance evaluation toolkit, a six-item self-administered questionnaire that explored various aspects of adherence to pharmacological treatment. The questionnaire was translated into Burkina Faso's three national languages (Mooré, Dioula, and Fufuldé) for respondents who did not speak French, which is the official language but not widely spoken. The patients were categorised as "poor adherers", with "minimal adherence problems", or "good adherers" based on their responses to the questionnaire items. We considered those with "minimal adherence problems" as "poor adherers" and conducted face-to-face interviews with such patients to understand the reasons for their non-adherence. During the interviews, we gathered information on various factors, including socio-demographic variables (age, sex, place of residence, profession, level of education, and socio-economic level) and therapeutic variables (duration of haemodialysis, duration of hypertension, number of haemodialysis sessions per week, number of antihypertensive drugs pills taken, and number of antihypertensive drug classes taken daily). We did not include the causes of kidney failure because kidney biopsies were not performed on any of the patients. In addition, many patients presented with stage 5 CKD, so their nephropathy was unknown.

We cleaned and analysed the data using Stata software version 16. Categorical variables are presented as means with standard deviations if they follow a normal distribution; otherwise, they are presented as medians with interquartile range (IQR). Categorical variables are presented as counts and percentages. The Yalgado Ouédraogo University Hospital did not have an ethics committee during the study, so that we obtained authorisation from the institution's director general. All patients included in the study provided informed consent, and we ensured that their rights and dignity were respected at all stages of the study.

RESULTS

General characteristics of the study population

Seventy-five patients participated in the study, with a median age of 44 years (IQR: 34–55 years). The median duration of dialysis for the patients was 36 months (IQR: 14–48 months), and the median duration of hypertension was six years (IQR: 4–14 years). The general characteristics of the patients are presented in Table 1.

Table 1. General characteristics of hypertensive haemodialysis patients (n = 75).

Patient characteristics	n	%
Sex		
Female	33	47
Education level		
Did not attend school	19	25.3
Primary	10	13.3
Secondary	36	48
Tertiary	10	13.3
Place of residence		
Rural	20	26.7
Urban	55	73.3
Occupation		
Unemployed	45	60
Employed	30	40
Socio-economic level[§]		
Low	46	61.3
Moderate to high	29	38.7
Number of weekly haemodialysis sessions		
Two	63	84
Three	12	16
Hypertensive drugs[*]		
CCB	64	85.3
RASi	38	50.7
CA	18	24
BB	15	20
Loop diuretic	3	4
Usual purchaser of antihypertensive drugs		
Patient alone	40	53.3
Relatives	35	46.7
Health-care insurance		
Yes	3	4
No	72	96

Abbreviations: *CCB, calcium channel blockers; RASi, renin–angiotensin system inhibitors; CA, central-acting antihypertensive; BB, beta-blockers.
§Assessed according to the patient's occupation, considering monthly income.

Adherence to hypertensive treatment

The adherence to antihypertensive treatment was poor in 65 (minimal adherence problems and poor adherence) of 75 patients. The main reasons for poor adherence, cited by patients, were the cost of medication and forgetting to take the drugs, reported by 45 and 39 patients, respectively. Table 2 illustrates the distribution of patients according to adherence quality and the reasons for non-adherence.

The median number of antihypertensive drug classes was two (IQR: 1–4). The median number of antihypertensive tablets taken daily was also two (IQR: 1–9). The median monthly cost of antihypertensive drugs per patient was US$ 25 (IQR: US$17–42). Patients' adherence was not associated with the number of antihypertensive pills taken daily or the estimated monthly cost of antihypertensive drugs purchased (Figures 1 and 2).

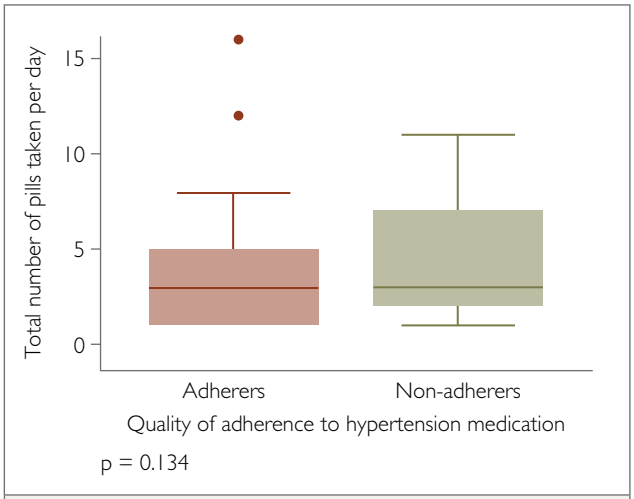

Figure 1. Median number of drugs pills taken daily by haemodialysis and hypertension patients at Yalgado Ouédraogo University Hospital (n = 75).

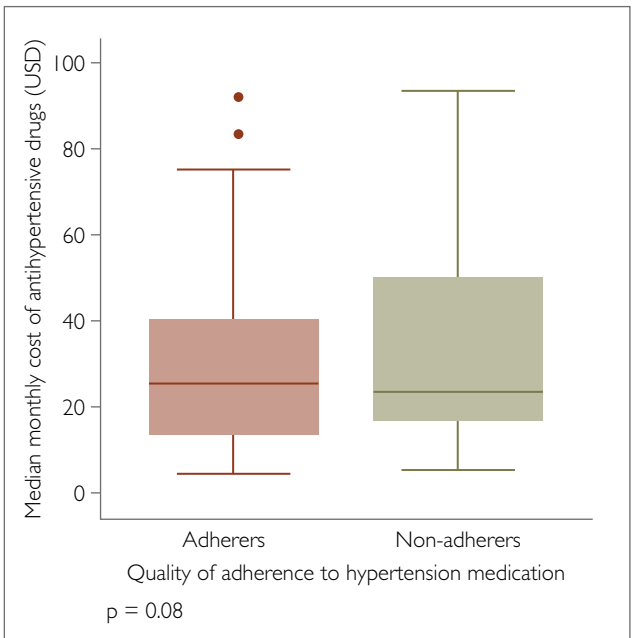

Figure 2. Monthly cost (US$) of hypertensive drugs purchased per haemodialysis patient at Yalgado Ouédraogo University Hospital (n = 75).

DISCUSSION

This study is the first to evaluate adherence to antihypertensive treatment among haemodialysis patients at a single hospital centre in Burkina Faso. We found that a high percentage of patients (86%) did not adhere to the treatment, with 49% revealing poor adherence and 37% experiencing minor adherence problems. The reasons for non-adherence to treatment were numerous, with the high cost of the drugs (69%) and forgetting to take them (60%) being the main factors. The haemodialysis patients surveyed were relatively young, with an average age of 44 years, had a low socio-economic status (61.3%), and lacked health insurance (96%). These characteristics reflect those in sub-Saharan African haemodialysis patients generally [11,12].

Table 2. Distribution of patients based on adherence to antihypertensive treatment and reasons for minimal/poor adherence.

	n	%
Quality of adherence (n = 75)		
Good	10	13
Minimal	28	37
Poor	37	49
Reasons for minimal/poor adherence (n = 65)*		
Treatment considered to be ineffective	10	15
Advice received from a third party	15	23
High drug costs	45	69
Drug side-effects	4	6.0
Lack of information	9	14
Complex dosing regimens§	23	35
Deliberately stopped	11	17
Forgotten	39	60

*The reasons for non-adherence were investigated only in those reporting minimal or poor adherence. §Complex dosing regimen was evaluated based on all the medications the patient took daily, including antihypertensive and non-antihypertensive drugs.

There are various methods used to assess adherence to pharmacological treatment, which can be categorised as direct or indirect. Direct methods involve measuring drugs or their byproducts in the plasma and urine or as markers of drug effectiveness (clinical or biological) and the directly observed treatment (DOT). In contrast indirect methods include analysing administrative data (such as prescriptions and drug refit), drug counts, and self-administered questionnaires [13,14]. In a recent meta-analysis, Bourque et al. reported that indirect methods underestimated the prevalence of nonadherence in patients with resistant

hypertension compared to direct methods (20% versus 46%) [15]. The Girerd and Morisky self-administered questionnaires are examples of an indirect method used to assess adherence to antihypertensive treatment [10,16]. As indicated by Allenet et al., self-administered questionnaires may be influenced by recall bias, a sense of social desirability, and the wording of the questions [13]. Despite these limitations, we used the Girerd et al. adherence evaluation tool in our study because it is simple and validated for use in the general population as it is a challenge to implement direct measures in our situation. Owing to their high cost, determining the presence of drugs or their byproducts in urine or plasma is not feasible for widespread use in sub-Saharan African countries, and that applies in our case. However, directly observed treatment necessitates trained medical personnel to be available outside of haemodialysis centres. A possible compromise could involve using telephone and internet communications (such as sending reminders to patients via text messages, phone calls, or emails) and involving community health workers.

Overall, 86% of our hypertensive haemodialysis patients were non-adherent. Neri et al. in Italy, using the Morisky questionnaire, reported that among 1,238 haemodialysis patients in 54 centres, only 48% adhered to treatment [17]. Systematic reviews of hypertensive patients more widely revealed an overall prevalence of adherence of 34% in Africa [18] and 52% in Asia [19]. It should be recognised, however, that the adherence to treatment varies widely in the literature. We identified several factors contributing to poor adherence to medication. These include the high costs of drugs, forgetfulness on the part of the patient, complex dosage regimens, perceived ineffectiveness of treatment, the side effects of treatment, and voluntary discontinuation of the practice. Additionally, factors such as young age, male sex, inadequate social support, a high number of comorbidities, health beliefs, depression, frequent dosing, the number of drugs to be taken, patients' perception of treatment benefits, poor patient–physician communication, lack of motivation, and unfavourable economic conditions are also known to contribute to poor adherence [17-21]. We found that 50% of our patients paid US$ 25 per month for antihypertensive treatment in a country where 45% live on less than one US dollar per day [22]. Without health insurance, poverty remains a significant factor in non-adherence to antihypertensive and other treatments prescribed for haemodialysis patients.

In our study of 39 haemodialysis patients, we found that forgetfulness was the main reason for poor adherence to treatment. Moreover, it is common for patients with CKD to experience cognitive impairment and depression [23-25]. According to data from the REGARDS study, Muntner et al. reported that 27.7% of people with CKD admitted to forgetting to take their medication [26]. We discovered that 23 of our haemodialysis patients mentioned that they found it difficult to keep to their antihypertensive treatment due to complex dosing regimens. We observed also that over a third of the patients had not received a secondary education, and a quarter had not attended school. This lack of education can lead to a poor understanding of treatment dosages, especially when dealing with multiple medications. Our study suggests that polypharmacy may contribute significantly to poor adherence. Furthermore, 10 patients did not take their medication because they believed it was ineffective, whereas 11 subjects intentionally stopped their treatment for other reasons. Because Burkina Faso is a poor country, there is a strong belief in alternative medicine [27,28]. Additionally, the asymptomatic nature of hypertension may lead patients to believe that they are not ill. Our findings emphasise the importance of establishing therapeutic education programmes for patients. Furthermore, this study implies that funding for treating CKD should be greatly expanded through a universal health insurance system.

Strengths and limitations

The results of our study cannot be applied to all haemodialysis patients in Burkina Faso because our sample's size was small and represents a single centre. However, we did identify specific factors related to sub-Saharan African countries that can account for the non-adherence to antihypertensive treatment of haemodialysis patients.

CONCLUSION

Our study revealed that most haemodialysis patients with hypertension at YO UHC adhered poorly to their antihypertensive treatment; this was mainly due to the unaffordability of medication. The health implication of poor adherence to anti-hypertensives is poor blood pressure control leading to increased morbidity and mortality from cardiovascular disease, regardless of the reasons for poor adherence. Therefore, mechanisms to improve accessibility and affordability are needed. This may include support from government institutions.

Conflict of interest

The authors have no conflicts of interest to declare.

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