Direct cost of care for hypertensive patients in Burkina Faso

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Abstract

In Burkina Faso, the high blood pressure represents the first cardiovascular risk factor. Few data are available about the costs paid by hypertensive patients for public policies guidance. This study aimed to estimate the direct average cost for hypertensive patient care according to their income in urban area in Burkina Faso. In 2015, from January to December, we performed across-sectional study in the different levels of health care system in Bobo-Dioulasso. Study included hypertensive patients (more than 18 years old) who are regularly followed-up for at least twelve months and without complication of hypertension. We carried outa randomcluster sampling with a consecutive recruitment of the patients. One-way-ANOVA test was performed to compare the monthly average income and the direct average cost for hypertensive patient care. One hundred and fifty six (156) non-complicated hypertensive patients were included. The direct average cost was of 74 626.9 FCFA per patient-year (138 USD), IC95% [66 303.4 FCFA (123 USD) – 82 950.3 FFA (154 USD)] patient-year, corresponding to 6219 FCFA (11.5USD) per patient-month. The drugs represented 66.9% of the wholetotal costs. The monthly low income was associated with the high direct average cost for hypertensive patient care. Free health care policies are implementing in West Africa. Considering equity of access to health care by poorest, a subsidy of antihypertensive drug could be a great opportunity to reduce financial barrier to care for hypertensive patients, and so, avoiding its complications.

Keywords: hypertension, direct cost, income, sub-saharan Africa.

Coûts directs des soins pour les patients hypertendus au Burkina Faso

Résumé

Au Burkina Faso, l'hypertension artérielle représente le premier facteur de risque cardiovasculaire. Peu de données sont disponibles sur les coûts payés par les patients hypertendus pour les orientations des politiques publiques. Cette étude visait à estimer le coût moyen direct des soins des patients hypertendus en milieu urbain au Burkina Faso. En 2015, de janvier à décembre, nous avons réalisé une étude transversale sur les différents niveaux du système de santé à Bobo-Dioulasso. L'étude a porté sur des patients hypertendus (âgés de plus de 18 ans) qui sont régulièrement suivis pendant au moins douze mois et sans complication d'hypertension. Nous avons effectué un échantillonnage aléatoire en grappes avec un recrutement consécutif des patients. Une analyse des variances (test ANOVA) a été réalisée pour comparer le coût moyen direct des soins patients hypertendus selon les catégories de revenu mensuel. Cent cinquante-six (156) patients hypertendus non compliqués ont été inclus. Le coût moyen direct était de 74 626,9 FCFA par année-patient (138 USD),

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IC95 % [66 303,4 FCFA (123 USD) - 82 950,3 FFA (154 USD)] par année-patient, soit 6 219 FCFA (11,5 USD) par mois-patient. Les médicaments représentaient 66,9 % de l'ensemble des coûts totaux. Le faible revenu mensuel était associé au coût moyen direct élevé des soins aux patients hypertendus. Les politiques sur les soins de santé gratuits sont mises en œuvre en Afrique de l'Ouest. Compte tenu de l'équité en matière de santé dans l'offre de soins aux plus pauvres, une subvention des médicaments contre l'hypertension artérielle pourrait être une excellente occasion de réduire les obstacles financiers aux soins des patients hypertendus et d'éviter ainsi ses complications.

Mots-clés : hypertension artérielle, coûts directs, revenus, Afrique sub-saharienne.

Introduction

In sub-Saharan Africa, the number of people living with a high blood pressure is estimated at 74.7 million (1). An increase of 68% (125.5 million) of the number of hypertensive people is awaited in 2025 if nothing is done in sub-Saharan Africa (1, 2). Hypertension represents one of the most significant factors of mortality with 20-50% of all the deaths. Indeed, iIndeed, it is estimated at 9,4 million dead per year due to arterial hypertension complications (3). However, studies in Africa showed that the strategies of detection, the treatment and the control of the hypertension are sub-optimal (4, 5). Among the explanatory factors the role of the health system is identified (6) and particularly the financial barriers (7–11)(11–15). In Burkina Faso, the hypertension represents the first cardiovascular risk factor with a prevalence of 17.6% (12). Disparities exist between the urban and rural area. People having 60 years old or more pay the heaviest burden (13). A strategic plan to fight against the non-communicable diseases 2014-2018 has been developed to take into account the treatment and the control of hypertension (14). But the implementation of this plan is still problematic and is not yet operational (15).

The financial access to healthcare is weak in Burkina Faso. This required successive reforms such as in 2013 the financing based on the results (FBR) with a component of community-based mutual insurance of health, in 2015, the universal health coverage and more recently in 2016, the exemption of care payment for the under 5 years-old and women.

However, there are not data available about the costs of hypertension patients care to guide public health thinking. The majority of the costs for the care of hypertension is the responsibility of patients. Also, the care of patients with chronic conditions as hypertension is strongly characterized by potentially inappropriate medical prescribing (16). That could allow financial over-costs for both patients and health facilities.

In a context marked by major reforms on the health system in Burkina Faso to move towards to Universal Health Coverage, information on the economic burden of chronic diseases such as hypertension is needed. This study aimed to estimate the direct average cost for hypertensive patient care according to their income in urban setting in Burkina Faso.

Design and methods

Study design

We carried out a cross-sectional study from January to December 2015 in the two districts hospitals and in the cardiology department of the national teaching Hospital in Bobo-Dioulasso.

Setting

In Burkina Faso, the organization of care follows a three-level health pyramid. Our study was carried out in Bobo-Dioulasso, the second biggest city of the country. Healthcare in this city has only the first and the third levels 1) the first level by the primary health centers, the medical centers and the district hospitals, 2) the third level by the national teaching Hospital called Sanou Sourô. The district hospitals of Do and Dafra, and the national teaching Hospital cover the city of Bobo- Dioulasso which population estimated in 2006 to 646 612 inhabitants based on the general census(17).

Participants

The population of study included hypertensive patients attending the health centers selected (district hospitals of Do and Dafra, and the cardiology department of Sanou Sourô national teaching Hospital) for the study. The criteria of inclusion were: adult hypertensive patient (more than 18 years-old) who are regularly followed for at least twelve months and without complicated AH. We performed a random cluster sampling with a consecutive recruitment of the patients. The sample size was calculated by the Schwartz formula using a prevalence of 17.6%, a confidence level of 1.96 and an accuracy of 6%. We recruited 156 patients with 109 patients from Do district hospital, 36 patients from Dafra district hospital and 11 patients of the cardiology department of the national teaching Hospital. The patients were recruited successively according to the proportion of the sample size in each structure. The data collector was present in the health structures from Monday to Friday. He spoke with hypertensive patients who agreed to participate to the study after their check-up appointment until number of cases was reached. The data was collected by an interview coupled with a documentary review of medical records (health records, consultation register).

Variables

Hypertension

Arterial hypertension was defined as a permanent elevation of the systolic blood pressure (SBP) equal or higher than 140 mm Hg, and/or diastolic blood pressure (DBP) equal or higher than 90 mm Hg, and/or based on documented of hypertension drugs medication taking (18).

A patient was classified as a case of non-complicatedhypertensive if he/her does not present signs/symptoms of repercussion on target organs (heart, kidney, brain, eye or vascular system).¶

Direct costs

We separated the medical direct costs from the non-medical direct costs(19).The medical direct costs were the total of the consultation costs, hypertension drugs costs and the biological and X-Rayexams costs carried out for the hypertension patient. The non-medical direct costs were represented by the travel fees from the house of the patient to the health facility. The direct costs were estimated over a period of one year.

Income of the patients

The patient's income represented the estimate of the average amount of money the patient received each month. It was estimated on the basis of patient statements. Based on the Inter-professional

minimum wage for growth in Burkina Faso which value is 32 000 FCFA (59.30 USD, for 1 USD corresponding to 539,630 FCFA) in 2014(20), patients have been classified in four groups of income:

- [0-40 000 FCFA [= low income
- [40 000-100 000 FCFA [= average income
- [100 000-250 000 FCFA [= high income
- ≥ 250 000 FCFA = very high income

Data sources

The data collection was conducted by two methods: 1) an interview with the patients completed by his physical examination and 2) a review of documents of the patients (the personal health booklet , the register of consultation and prescriptions) to collect the information that could allow the economic evaluation.

The drugs costs, the consultation costs, biological, radiological costs were reviewed through the medical prescriptions and the invoices of patients. The drugs costs were collected from the generic essential drugs store of the health centers or from the pharmacy (for non-generic drugs) where price were usually higher. The travel costs has been estimated based on the taxi fees (average of 1000 FCFA (1.85 USD)) and/or based on the fuel used to go to the health center.The amount of fuel was estimated on the basis of the patient's reports and / or the distance and means of travel used. The data collection tool was a standardized questionnaire for each patient. Principal items of the questionnaire were the socio-economic characteristics, the clinical information, the treatments received, the additional exams (biological, radiological) carried out during the last 12 months.

The patients were recruited at the end of their follow-up consultation. After fulfilling the informed consent form, 30 minutes were necessary to fill out the questionnaire. The data collection was conducted by a physician under the supervision of two health economists, a cardiologist and a public health specialist.

Data analysis

The analysis allowed the estimating of the proportion of the patients classified according to level of income per month and per year (with IC 95%); the direct average cost (standard deviation) of the non-complicated hypertension by person-year and person-month. We performed the test of one-way-ANOVA to compare the monthly average income of the patient and the direct monthly average cost for medical supporting non-complicated hypertensive patient. The significant threshold for the statistics tests was 0.05. Data Da Data entry and analysis were carried out using the Stata software in its version 13.0.

The currency used was the west Africa CFA and the time horizon was short-term.

Ethical and administrative considerations

Data collection has been approved by the Muraz Center ethics committee and administrative authorizations obtained from the health authorities. Participants in the study were informed and their written and informed were gathered.

Results

Participants

Among the 156 patients, the mean age was 55.6 years, 95% of them were men (Table I). The unschooled (54%) were the most represented and almost two-thirds (62.8%) of the population had the lowest incomes (less than 40.000 Fcfa). About two-thirds (68%) of participants had moderate hypertension. Untreated patients, representing approximately 2%, were patients only under dietary measures without medication.

Table I. Characteristic of study participants

Variables	N	%
Sex		
Men	148	94.87
Women	08	5.13
Educationallevel		
Unschooled	85	54.5
Primary	40	25.6
Secondary	23	14.7
University	8	5.1
Income		
[0 - 40 000 FCFA[	98	62.8
[40 000 - 100 000 FCFA[	21	13.5
[100 000 - 250 000 FCFA[	19	12.2
≥ 250 000 FCFA	18	11.5
Hypertension level		
Normal	23	15
Moderated	106	68
Severe	27	1717
Therapeutic profile		
Treated	153	98.1
Untreated	3	1.9

The cost of the non-complicated hypertension¶

The direct average cost of non-complicated hypertension was 74 626.9 FCFA, IC95% [66 303.4-82 950.3] per patient-year corresponding to a cost of 6 219 FCFA per patient-month.

The non-medical direct cost, represented here by the transport fees, was 4 034.62 FCFA per patient-year.

The drugs accounted for 66.9% of the total costs. The table II presents the categories of costs.

Table II. Average annual direct costs of treating high blood pressure in 2014 in the city of Bobo-Dioulasso

Headings of costs		Costs per patient-year (FCFA)	SD	%
direct medical cost	consultation	12 000.00	-	16.1
drugs		49 890.35	3700.5	66.9
paraclinical exams	biological	7 320.51	961.2	9.75
radiological		1 381.41	275.3	1.85
transport		4 034.62	276.99	5.4
medicalcost		74 626.90	4213.58	100

Direct average medical cost by income level per patient

There was a statistically significant difference between the direct monthly average cost of hypertensive patient care and the monthly income of the patient. The patients from both low and average income groups spent significantly more money per month on direct medical costs than thosein income groups (Table III).

Table III. Distribution of the average monthly direct cost of HTA care by monthly income of hypertensive patients

Monthly average income of the hypertensive patients	average cost per-month (FCFA)	SD	*p*value
[0 – 40 000 FCFA [	6 100,0	4 434.6	0.0290
[40 000F-100 000 FCFA [	8 576.6	6 225.5	
[100 000-250 000 FCFA [	4 589.8	1 225.7	
≥250 000 FCFA	5 835.0	2 428.5	

SD : standard deviation

Discussion

The objective of our study was to estimate the direct average cost of hypertensive patient care by income in urban environment in Burkina Faso. The drugs accounted for 66.9% ofcosts. There was a statistically significant difference between the average monthly direct costs of managing hypertension according to the patient's monthly income categories. The monthly average cost per non-complicated hypertension patient was higher than the average income per patient.

There are some limits in this study, mainly related to cross sectional study and reviewing medical documents. As well, the recruitment of the patients was carried out within the health facilities. Finally, in the analysis of the costs, the associated comorbidities as well as other medicines were not taken into account. These biases could contribute to under or over-estimate the economic evaluation of the hypertension

The results of this study suggest that inequity in access to health care remains a reality, mainly for hypertensive patients. They were mostly less educated and vulnerable, with low monthly income.

In addition, the most vulnerable patients spend more money on their care than the richest. This situation could be rooted in the «low care inverse» theory (21) for which the availability of quality health care is inversely proportional to the needs of the population served.

The higher health care costs for poor hypertensive patients could be explained by the financial barrier of direct payment of care in health facilities. This results in the delay of the consultation; patients would prefer to go to informal care or self-care, or to follow a parallel medicine known in our context (22). This delay of consultation can lead to the evolution towards the complications requiring more complementary examinations and a more complex treatment.

For drugs that represented the highest cost category in this study, they constitute a barrier that could lead to non-adherence to treatment (6). In addition, this last could be a source of evolution of the complicated form of hypertension and its burden, like many repeated hospitalizations with additional costs for individuals and society.

In Burkina Faso, the majority of the population lives below the poverty line (23). This is why mechanisms for financial access to health care (community-based health insurance scheme, compulsory health insurance system) are being put in place to facilitate access to care for the population. This could be an opportunity to consider chronic diseases such as high blood pressure. In Burkina Faso and in the African context, the penetration rate in the mutual health insurance rarely exceeds 10 to 15% (24) due to the low financial capacity of the members (25). Knowing this, Universal Health Coverage could be an alternative.

Universal Health Coverage is a public policy priority for the majority of sub-Saharan African countries. However the operationalization is still slow. So far, only few risks are covered by healthcare programs through health mutual in Africa and Universal Health Coverage. Chronic pathologies are still considered non-cost-effective for health programsfiancing (26)(28). However, in the European context, studies have shown that the increases projected in the public expenditure of health associated with ageing are modest. Calculated over five-year periods, the annual average increase of the public expenses per capita is uniform between the five countries considered in the analysis and will slow down from the 2030s.

In sub-Saharan Africa, recent interesting results support that services and care offered to hypertensive patients for covering health are cost effective (27).

Conclusion

Free health care policies are implementing in West Africa. Considering equity of access to health care by poorest, a subsidy of antihypertensive drug could be a great opportunity to reduce financial barrier to care for hypertensive patients, and so, avoiding its complications. However, further research are important in order to analyze direct and opportunity costs of the care of the hypertensive subject by taking into account the associated comorbidities in rural and urban area.

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