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Original article

Assessment of treatment adherence among hypertensive patients in Moroccan region

Évaluation de l'observance du traitement chez les patients hypertendus dans une région marocaine

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Abstract

Introduction: Chronic conditions require long-term treatment for effective control. Patients with chronic illnesses do not comply with treatment; only half adhere to it. This non-adherence is multifactorial. The objective of our study was to describe the determinants and the level of treatment adherence in hypertensive patients.

Methodology: A cross-sectional observational study in primary health care establishments in the prefecture of Fez from May to November 2018 using a specific administered tool for anonymity.

Results: In total, we included 404 subjects in the study. The majority of women were represented (71.3%). The oldest represent 58.2% of the participants. Clinically, the mean duration of patient follow-up was 7.2 ± 5.9 years and comorbidities were found in 56.2% of cases. The number of tablets was 1.65 ± 1.20. The percentage of compliant patients was 52.3%. After multivariate analysis, good knowledge of arterial hypertension (p <0.000), absence of comorbidities (p <0.004) and treatment (0.015) were factors associated with better adherence to treatment.

Conclusion: Adherence to treatment is an essential component for the control and optimal management of arterial hypertension. An association was found between the absence of comorbidities and knowledge of the pathology. Therapeutic education and access to care must remain a priority in health policies.

Keywords: hypertension; treatment adherence; knowledge; comorbidities.

Résumé

Introduction: Les pathologies chroniques nécessitent la prise d'un traitement au long terme pour un contrôle efficace. Les patients atteints de maladies chroniques n'adhèrent pas au traitement; seulement la moitié y adhère. Cette non-adhérence est multifactorielle. L'objectif de notre étude était de décrire les déterminants et le niveau d'observance au traitement chez les patients hypertendus.

Méthodologie : Une étude observationnelle transversale a été menée dans les établissements de soins de santé primaires de la préfecture de Fès de mai à novembre 2018 à l'aide d'un outil administré spécifique anonyme.

Résultats : Au total, nous avons inclus 404 sujets dans l'étude. La majorité des sujets étaient des femmes (71,3%). Les plus âgés représentent 58,2% des participants. Cliniquement, la durée moyenne de suivi des patients était de 7,2 ± 5,9 ans et des comorbidités étaient retrouvées dans 56,2% des

cas. Le nombre de comprimés était de 1,65 ± 1,20. Le pourcentage de patients observant au traitement était de 52,3%. Après analyse multivariée, une bonne connaissance de l'hypertension artérielle (p <0,000), l'absence de comorbidités (p <0,004) et le traitement (0,015) étaient des facteurs associés à une meilleure observance du traitement.

Conclusion: L'observance du traitement est un élément essentiel pour le contrôle et la prise en charge optimale de l'hypertension artérielle. Une association a été trouvée entre l'absence de comorbidités et la connaissance de la pathologie. L'éducation thérapeutique et l'accès aux soins doivent rester une priorité des politiques de santé.

Mots-clés : hypertension ; l'observance du traitement ; connaissance ; comorbidités.

Introduction

Non communicable diseases (NCD), traditionally associated with urbanization and higher standards of living, accounted for 3.1 million deaths (33.5% of all deaths), compared with 29.4% in 2010. And since then, Africa's health situation is deteriorating. WHO estimates that NCDs will increase by 27% over the next 10 years on this continent and will be responsible for an additional 28 million deaths[1]. Morocco is not marginal; the proportion of Moroccans suffering from at least one chronic disease has increased according to the results of the national survey on family health. This rate reached 21% in 2018, compared to 18.2% in 2011 [2]. Chronic conditions require long-term treatment for effective control (1). Drug compliance is defined as the ratio of the number of actual drug intakes over a period of time to the number of doses prescribed over the same period (2). It is noted that patients with chronic diseases are not observant to treatment; only half adhere to it (3). This non-adherence is multifactorial. It depends on demographic factors, care system factors and the health care team, pathology-related factors, treatment-related factors, and patient-related factors[3]. This is not without consequence especially in the case of hypertension because non-observant patients will not have a good control of systemic blood pressure. This exposes the patient to the occurrence of complications ranging from multi-organ failure to cerebrovascular sequelae (responsible for an impairment of quality of life) or even death. According to WHO, hypertension is responsible for nearly 8 million deaths per year [4].

It is the 2nd most common pathology in Morocco and is found in more than half of 40-65 years (53.8%) [5]. Taking into account the numbers of non-compliance with treatment, it follows that nearly a quarter of adults between 40-65 years old is at risk of having a non-control of blood pressure and this by noncompliance with treatment. This is likely to be a major public health problem in terms of the cost of care (increased consultation with health care providers, cost of dialysis and other supportive treatments) but also in terms of health for the economy of health [6].

The objective of our study was to describe the determinants and level of adherence to treatment in hypertensive patients. To our knowledge, no similar study has been conducted in Morocco.

Methodology

• Study design

We conducted a cross-sectional observational study in the primary health care facilities of the prefecture of Fez from May to November 2018.

• Inclusion criteria

Outpatient patients seen in consultation, over the age of 18 diagnosed as hypertensive according to the recommendations of the WHO (systolic blood pressure (SBP) and / or diastolic blood pressure (DBP) ≤ 140 mmHg and 90 mmHg respectively) and who have been receiving antihypertensive treatment for at least 1 month were included. No patients seen in cardiologic consultation has refused to participate in study. We excluded pregnant women (previously known hypertensive or with toxemia of pregnancy) and renal failure dialysis or not, patients with severe disability sequelae and those with severe

complications such as vascular dementia.

• Ethical and regulatory aspect

The approval of the Fez University Hospital Ethics Committee was obtained under No. 21/17 and the agreement of the Ministry of Health. Those who agreed to participate were asked to sign a written consent form. Anonymity and confidentiality were respected for all participants.

• Data collection

Data collection was carried out by the 5th year medical students of the Faculty of Medicine and Pharmacy of the Sidi Mohammed Ben Abdellah University. They received training with one of the main investigators for data standardization. Data include a general questionnaire concerning personal and clinical data: age at time of interview, sex, place of residence, marital status, residence, alcoholic status, smoking status, profession defined in terms of professional categories, level of study, date of diagnosis of hypertension, blood pressure(BP) taken at the time of the interview (controlled if SBP and/or DBP ≤ 140 mmHg and 90 mmHg respectively ranged by 5th year medical students), height, weight, medication in the last month number of tablets per dose taken in tracking book.

We used a specific treatment adherence questionnaire, developed by Pacheco Rodrigues MT et al[7]. The questionnaire was translated into French by a bilingual investigator. It makes it possible to obtain the level of adhesion of the patients to the treatment. Adhesion levels vary between 60 and 100:

- 60: At this level, hypertensive patients do not take medication for hypertension at least once a week. Neither the prescribed dose at least once a week.
- 70: Hypertensive people at this level neglect to take their hypertension medication at the right time at least once a week. They attend appointments.
- 80: At this level, hypertensive patient do not take the prescribed dose at least once a month. They take their medications without symptoms or not, regularly take medical treatment and reduce by one third the intake of salt and fat and sweets and the consumption of sugary drinks.
- 90: Hypertensive people at this level neglect to take their medications at the right time at least once a month: they have salt, fats and sweets and sugary drinks.
- 100: At this level, people with high blood pressure fail to take their hypertension medication at least once a year and consume virtually no fat, sweets or sugary drinks.
- 110: From this level, hypertensive people do not neglect to take their antihypertensive drugs, eat practically no salt and regularly follow non-pharmacological treatments.

We considered patients with an adherence score greater than or equal to 91 as adherent patients. Patients with score inferior to 91 were considered as non adherent.

Concerning knowledge about HBP, we used a specific questionnaire on knowledge of high blood pressure. This is 25 items questionnaire[8]. Each of the items has 3 response possibilities where the correct answer is scored 10, we scored 0 to the wrong answer and to the answer DO NOT KNOW. A score on 100 is obtained. The score is then categorized using the average on one hundred:

- Good: ≥50
- Bad: <50
- Statistical analysis

The analysis was done with the software EPIinfo7: descriptive of the set of variables concerning socio-demographic, socio-economic and clinical criteria. Frequencies will be used for categorical variables. Averages and standard deviations will be used for quantitative variables. The univariate analysis: the association between adherence to treatment and the explanatory variables described in the literature will be sought. The classical parametric tests will be used to test these associations (chi2 test and T test). Logistic regression analysis will be used to determine associated factors with adjustment to third-party factors. The significant association will be presented using old ration and its confidence interval .The threshold of significance was set at 0.05.

Results

In total, we included 404 subjects in the study. Women were predominantly represented (71.3%) with a female to male ratio of 2.48.

The most represented age group was patients over 60 years old. They accounted for 58.2% of the total sample. Mean age was 59.89(SD 11.05) years in women and 62.19(SD11.41) years in men.

Most of the patients lived in urban areas (83.7%). Married people accounted for more than half of the sample (68.8%). More than half of the subjects had no education (44.6%). The unemployed accounted for 44.1% of the pattern.

Nearly half of the patients had a monthly income of less than 2,000 dirhams (46.8%) whether 375 €. More than half of the patients benefited of RAMED insurance (52.6%). Alcoholics accounted for only 5.8% of the sample and smoker and ex smokers represented 19.0% of the sample. These results are showed in table I.

Percentage of adherent patient was 52.3%. Clinically, the mean duration of follow-up of patients was 7.2 (SD5.9) years and comorbidities were found in 56.2% of cases “table I”.

Blood pressure was correct in 46.9% of cases. The majority of the patients were overweight. They accounted for 65.8% of the sample. These results are given in the table II.

In univariate analysis, profession was the one socio-demographic variable associated to adherence. Clinically, comorbidities, knowledge and treatment were significant associated to adherence. Patient adherent have not less frequently an associated comorbidity. Patient with good knowledge in hypertension were most adherent. Patients under ICE were the most adherent “table III”.

After multivariate analysis, good knowledge about arterial hypertension (AOR=2.739, 95% CI [1.860-4.465]), the absence of comorbidities (AOR=2.062, 95% CI [1.259-3.377]) and treatment with ICE versus diuretics (AOR=3.759, 95% CI [1.287-10.982]) were factors associated with better adherence to treatment after adjustment for profession “table IV”.

Table I: Basic socio-demographics and clinical characteristics of groups of participants

Gender	
Women	71.3%
Men	28.7%
Age range	
<60years	41.8%
≥60years	58.2%
Habitat type	
Rural	16.3%
Urban	83.7%
Marital status	
Single	5.3%
Married	68.8%
Divorceed	4.2%
Widowed	19.6%
Level of studies	
Without	55.1%
Primary	22.5%
Secondary	11.9%
Tertiary	9.4%
Profession	
Farmer	7.2%

Professionals	6.9%
Workers	28.4%
Without	44.6%
Retired	11.5%
Outcome	
<375 €	77.2%
≥375 €	22.8%
Insurance	
Mutual	41.3%
RAMED	52.6%
Without	6.0%
Alcohol	
Yes	5.8%
No	94.2%
Tobacco	
No smoking	81.0%
Ex Smoker and smoker	19.0%
During of follow up (mean±standard-deviation)	7.23 (±5.90)
PA controled	
Yes	46.9%
No	53.1%
BMI	
<30	34.2%
≥30	65.8%
Comorbidities	
Yes	56.2%
No	43.8%
Number of tablets / day (mean ± standard deviation)	1.65 (±1.20)
Treatment	
Diuretics	89.0%
ICE	15.7%
Calcium inhibitors	49.7%
Beta-blockers	9.6%
ARBs	16.0%
History of family HTA	
Yes	43.1%
No	56.9%
Knowledge class	
Good	43.8%
Bad	56.2%
Treatment adherence	
Adherent	52.3%
No adherent	47.7%

Table II: Univariate analysis between treatment adherence and socio-demographics variables

Caracteristics	Adherence(%)		p
	Adherent	Non adherent	
Gender			0.761
Women	162(71.7)	111(70.3)	
Men	64(28.3)	47(29.7)	
Age range			0.543
<60years	88(39.8)	67(42.9)	
≥60years	133(60.2)	89(57.1)	
Habitat type			0.940
Rural	33(15.4)	23(15.1)	
Urban	181(84.6)	129(84.9)	
Marital status			0.969
Single	12(5.5)	8(5.1)	
Married	156(70.9)	108(69.2)	
Divorcee	10(4.5)	7(4.5)	
Widowed	42(19.1)	33(21.2)	
Level of studies			0.611
Without	116(53.0)	92(59.0)	
Primary	54(24.7)	30(19.2)	
Secondary	28(12.8)	28(12.8)	
Tertiary	21(9.6)	21(9.6)	
Profession			0.040
Farmer	12(5.5)	15(9.8)	
Professionals	21(9.6)	6(3.9)	
Workers	65(29.8)	34(22.2)	
Without	99(45.4)	77(50.3)	
Retired	21(9.6	21(13.7)	
Outcome			0.879
<375€	136(78.2)	96(77.4)	
≥375€	38(21.8)	28(22.6)	
Insurance			
Mutual	95(42.8)	64(41.0)	
RAMED	114(51.4)	83(53.2)	
Without	13(5.9)	9(5.8)	0.937
Alcohol			
Yes	11(5.5)	5(3.6)	0.422
No	190(94.5)	134(96.4)	
Tobacco			
No smoking	180(81.4)	128(83.7)	0.581
Ex Smoker and smoker	41(18.6)	25(16.3)	

Table III: Univariate analysis between treatment adherence and clinical variables

Caracteristics	Adherence		p
	Adherent	Non adherent	
During of follow up (mean±standard-deviation)	7.2±6.0	7.4±6.0	0.655*
PA controled (%)			0.979
Yes	69(46.6)	101(46.8)	
No	79(53.4)	115(53.2)	0.210
BMI (%)			
<30	62(32.1)	55(38.7)	
≥30	131(67.9)	87(61.3)	
Comorbidities			0.013
Yes	102(51.5)	90(65.2)	
No	96(48.5)	48(34.8)	
Number of tablets / day (mean ± standard deviation)	1.7±1.1	1.5±1.0	0.184*
Treatment			0.008
Diuretics	24(11.5)	9(6.1)	
ICE	36(17.2)	18(12.2)	
Calcium inhibitors	111(53.1)	71(48.0)	
Beta-blockers	12(5.7)	20(13.5)	
ARBs	26(12.4)	30(20.3)	
History of family HBP			0.227
Yes	76(40.6)	64(47.4)	
No	111(59.4)	71(52.6)	
Knowledge class			
Good	152(67.3)	86(54.4)	
Bad	74(32.7)	72(45.6)	0.000

*test de Mann-Whitney

Table IV: Multivariate analysis between treatment adherence and socio-demographics and clinical variables

Caracteristics	Adherence OR (CI 95%)	p
Knowledge		0.000
Good	2.739(1.860-4.465)	
Bad	1	
Comorbidities		0.004
Yes	1	
No	2.062(1.259-3.377)	
Treatment		0.015
Diuretics	1	
ICE	3.759(1.287-10.982)	
Calcium inhibitors	2.568(1.084-6.086)	
Beta-blockers	1.811(0.938-3.496)	
ARBs	0.482(0.173-1.341)	
Profession		0.193
Farmer	0.607(0.195-1.885)	
Professionals	3.065(0.918-10.234)	
Workers	1.347(0.592-3.063)	
Without	1.158(0.538-2.494)	
Retired	1	

Discussion

In our study, which was designed to evaluate adherence to treatment, we found that patients were most frequently adherent in 52.3% of cases. Studies realized in middle East about antihypertensive adherence reported a non-adherence rates between 23% and 49.5% [9]. Another study conducted in Ivory Coast described a rate of adherence 12.5%[10]. All these result reported a non-adherence antihypertensive rate inferior compared to developing countries. A study realized by Girerd et al in France showed a adherence rate of 66%[11]. This difference can be the result of health system disparities, socio-cultural behavior difference and life conditions. In majority, the reason of no respect of taking medication is the lacj of financial means. It can be also due to the difference of tools used.

Numerous studies have demonstrated the association between knowledge of arterial hypertension and adherence to treatment, particularly in Ethiopia and China [12,13] as in our study. Knowledge of its pathology, its main risk factors and aggravating factors as well as any complications are a key point of therapeutic education for a patient understanding of the recommendations and guidelines for its management. A patient aware of the risks incurred when no taking his treatment is more compliant with respect to doses and regular intake.

The absence of comorbidities was statistically associated with adherence to treatment in agreement with several studies [14,15] that showed an decrease in adherence as a function of the number of associated chronic diseases. The presence of comorbidities involves additional medication that may increase side effects, which is more likely to be a risk factor for non-adherence to treatment as found in the literacy[16–18].

Therapeutic classes used for the management of hypertension have specific short- and long-term side effects that sometimes require class change during follow-up. The highest risk for non adherence treatment is linked in diuretics prescription. In our study, the therapeutic class was associated with adherence to treatment. This result are in according with study realized by Andrade et al [18]. Patient in ICE were the most adherent.

Considering gender, it was not associated with treatment adherence in agreement with some studies[16,19] which did not show any effects of the gender on adherence, results in contradiction with several results found in literacy[12,17,18,20,21]who highlighted an association with gender. Indeed, some authors suggest that women are less adherent because they are the primary caregiver of the family, so have less time and energy for their own personal care.[22]

In univariate analysis, profession was a socio-demographic variable linked to treatment adherence but after adjusting, there was no significant association. This result is in contradiction with study realized in Togo which described a worst adherence in active patient. Indeed, they suggest that active patients have many charges responsible for difficulties in submitting to the doctor requirements[23].

Level of education had no effect on adherence. This may due to the effect of an important cultural behavior that could influence recommendations to improve adherence[16].

Adherence to treatment was not related to age as found by Moreno et al[19]. Studies in China, Korea, and Austria [13,24,25] showed good adherence among older people. There is no consensus on the role of age in adherence, some studies observed an increase in adherence as age increased, while others found the opposite[26].

The habitat type had no effect on adherence. This result is in disagreement with that conducted by Al Ramahi et al[16] who highlighted an association between village residence and poor adherence to treatment. Morocco has a plan to combat the disparities between rural and urban areas for all provinces of the kingdom, it aims to improve socio-economic indicators in rural areas to cope with territorial dysfunction[27].

The duration of follow-up had no effect on adherence to treatment, in contradiction with the study conducted by Andrade et al who found a relationship between

the older of diagnosis of hypertension and the degree of abandonment[18].

Thus, only the presence of comorbidities, good knowledge of pathology and treatment were factors related to adherence to treatment.

Our study was based on a large representative sample of hypertensive subjects followed in Fez health policies. The evaluation of adherence to treatment was performed using a valid specific tool translated by a bilingual investigator.

The recorded blood pressure was that taken at the time of the interview. This may be a blood pressure that does not reflect the patient's blood pressure, given the white coat effect or the setting context. So we took an average from 2 successive measures.

Conclusion

Adherence to treatment is an essential component for the control and optimal management of arterial hypertension. An association was found between the presence of comorbidities, treatment and knowledge of the pathology. To this end, therapeutic education must remain a priority for health policies.

WHAT IS ALREADY KNOW

Hypertension is a major health problem in Morocco

Many factors can influence hypertension treatment adherence

½ hypertensive patient is compliant to hypertensive patient

WHAT THIS STUDY ADDS

Hypertensive Moroccan patients are moderately compliant to antihypertensive treatment

Many risk factors influence treatment adherence

promoting therapeutic education can improve treatment adherence.

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AUTHORS CONTRIBUTIONS

Angéla Christie Filankembo Kava, Nabil Tachfouti, Samira El Fakir: concept and design, writing and revision of manuscript. Amina Alaoui, Maryam Atassi, Passy Conde,Nada Otmani, Angéla Christie Filankembo Kava, Passy Conde, Noura Qarmiche: data collection/interpretation, table creation, writing and revision of manuscript. Angéla Christie Filankembo Kava: Literature search, writing and revision of manuscript

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Conflict of interest : None

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