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Medication adherence in patients with hypertension monitored in four GPs' offices

Mihaela Daniela Balta[1], Daciana Toma[2] *, Raluca Sfetcu[3,4]

[1] Carol Davila University of Medicine and Pharmacy Bucharest, Romania
[2] Private Practice "Dr. Toma Daciana", Bucharest, Romania
[3] National School of Public Health, Management and Professional Development, Bucharest, Romania
[4] Spiru Haret University, Bucharest, Romania

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Abstract

The prevalence of hypertension is high worldwide, with about one in two people having high blood pressure. Patients' adherence and persistence to treatment is an issue of particular concern to the family physician, who is in closest contact with the patient and his family. We aimed to evaluate the prevalence of hypertension and adherence to medication in a group of patients from the offices of four family doctors in Bucharest. We analyzed the medication adherence of 1652 patients with hypertension (HTN) by calculating the proportion of days covered (PDC) by prescription of at least one drug, and we have considered the patients adherent at a rate of 80% or above. We have also analyzed how the adherence varied based on the age of the patients and on the duration of the prescription issued by the general practitioner (GP). We have found a general HTN prevalence of 34,95%. Among the patients with HTN, 47.7% have been found to be medication adherent, while 20.3% of patients had 0 days covered by medication. The most frequent type of prescription issued was the longer duration one, valid for 3 months (23.3%), followed closely by the shorter-term ones - the 1-month prescriptions (20.4%). An increase in age was associated with an increase in the adherence rate. Our results indicate that more intensive efforts should be made to increase the adherence of patients HTN and that issuing long-term prescriptions could be one recommended intervention.

Keywords: Hypertension, prevalence, medication adherence, general practitioner, type of prescription.

Introduction

The prevalence of hypertension (HTN), the leading cause of cardiovascular disease and premature death worldwide, has increased over the past decade, especially among low or medium-income countries. According to the World Health Organization (WHO) data, cardiovascular disease is the leading cause of death worldwide, accounting for approximately 17.9 million deaths annually, mostly due to stroke and heart attack. Research also shows that 80% of premature heart disease and stroke are preventable [1].

In 2015, the prevalence of HTN, defined by blood pressure (BP) values greater than

* Correspondence to: Daciana TOMA, MD
Private Practice "Dr. Toma Daciana", Bucharest, Romania
E-mail: dacianatoma@yahoo.com

140/90mmHg measured in the office, was estimated to be between 30-45% worldwide in the adult population (>18 years), of which 24% are men and 20% women [2]. The percentage of hypertensives increases significantly after the age of 60 (>60%) when it becomes the most important cardiovascular risk factor. For 2025, an increase of 15-20% in the prevalence of HTN is expected, due to a modern lifestyle and a low adherence to therapy, less than 1 in 5 persons having their blood pressure under control [1].

The main factors that would explain these trends are considered excessive consumption of salt and processed foods, low potassium intake in the diet, obesity, high alcohol consumption and a sedentary lifestyle. Although new therapeutic molecules with high antihypertensive potency have been developed, the percentage of patients with BP values in the therapeutic target is still at an unsatisfactory level, especially among countries with low economic income [4]. The "Guideline for the management of arterial hypertension of the European Society of Cardiology" (2018) tries to offer simplified therapeutic schemes and recommends the combined therapy with 2 or 3 therapeutic agents in a single pill, in order to increase adherence and persistence to treatment and to increase the percentage of patients reaching the recommended targets of BP [3].

The SEPHAR study, a cross-sectional survey carried on in Romania, estimated the prevalence of HTN in our country in the adult population and the compliance with treatment, cardiovascular risk, and the damage of HTN on target organs [5]. The results of the last stage of the study (SEPHAR III) report that HTN was observed among 45.1% of all adult population in Romania and the compliance of treatment was estimated at 52.2% [6]. Despite the fact that risk factors are well known and that patients have access to modern combined therapies, 50-60% of all deaths are still due to cardiovascular causes in Romania [7].

One of the causes of this situation is low medication adherence. Adherence to long-term therapy is defined by the WHO as "the extent to which a person's behavior – taking medication, following a diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider". Even if it is known that adherence to therapies is one of the most important determinants of treatment success, the level of adherence is mostly a low one, being estimated at around 50% in the general population from developed countries and even lower in developing countries [8].

In this context, in the present study, we aim to estimate the adherence rate of patients with HTN monitored by four GP offices to the recommended medication and to identify factors that might influence the adherence rate.

Material and Methods

Design and sample

This is a retrospective observational study in which we analyzed the records of 5081 patients registered in the ICMed Patient management software by four GP Offices in Bucharest. This number represents all registered patients during the year 2019. To calculate the prevalence, we have excluded patients aged under 18 years old, which resulted in a total number of adult patients of 4699. Out of these, 1776 have a diagnosis of HTN, resulting in a 12-month period prevalence of 34.95%. For the subsequent analyses, we have excluded patients who have transferred to a different GP or have died during 2019, leaving us with a final sample size of 1652 patients diagnosed with HTN. Out of the 124 patients who have ceased to be monitored by the four GPs, 45 have exited the record by transfer to another doctor and 79 by death.

Measurement of adherence

In order to assess the adherence to the medication, we have calculated the proportion of days covered (PDC) with treatment (i.e., from prescriptions issued by the GPs) out of the 365 days of 2019. For the patients newly diagnosed with HTN during 2019, we have calculated the proportion of days covered with treatment out of the total number for which the patients should have medication (i.e., number of days since the diagnosis). We have coded all prescriptions that included at least one medication type, and we have also recorded as a separate variable the duration for which prescription has been issued (i.e., every month, every two months, every three months, or a mixed type of prescription). A percentage of 80% of the adherence rate is considered internationally to indicate adequate medication adherence, and we have used this cut-off point for our analyses.

Data analysis

Differences in frequencies have been tested with the Chi-Square test and mean differences with One-

Way ANOVA. Wherever required, we have also performed post-hoc analyses using Tukey's HSD test. To test the association between adherence and age, we have used the Pearson correlation coefficient. For all data analyses, we have used IBM's SPSS version 23.0.

Results

Demographic data

We included 1652 patients diagnosed with HTN and monitored in four GP practices in Bucharest. The mean age of the participants was 68.81 (13.68) years; 37.2% of these were male and 62.8% female. We have used the Chi-Square test to check if the structure of the HTA patients was different in terms of gender representation. However, there were no significant differences between the four GP offices included in the study. The demographic data of participants by the GP office is included in Table 1.

We have found that the mean age of the patients with HTN monitored by the four GP offices (GPO) is significantly different, as determined by One-Way ANOVA (F (3,1648) = 17.37, p = .00). The post-hoc analysis using Tukey's HSD test shows that the mean age of HTA patients monitored by GPO1 is significantly higher than the other three offices and the age of patients monitored by GPO2 is significantly lower than GPO1 and GPO4 but similar to the mean age of HTA patients monitored by GPO3 (Figure 1).

A large proportion of the 1652 participants had a diagnostic of HTA at the beginning of 2019 and only 6.2% of these have been registered during 2019. There are no significant differences between the offices under this aspect, as it can be observed in Table 2.

Table 1. Demographic data of participants (patients diagnosed with HTN) by GP office.

GP office	Mean age (St.Dev)	Male	Female	Total
GP office 1	71.77 (13.68)	177 (33.1%)	357 (66.9%)	534 (100.0%)
GP office 2	65.19 (13.71)	124 (39.2%)	192 (60.8%)	316 (100.0%)
GP office 3	67.51 (13.91)	163 (41.1%)	234 (58.9%)	397 (100.0%)
GP office 4	68.99 (12.58)	150 (37.0%)	255 (63.0%)	405 (100.0%)
Total	68.81 (13.68)	614 (37.2%)	1038 (62.8%)	1652 (100.0%)

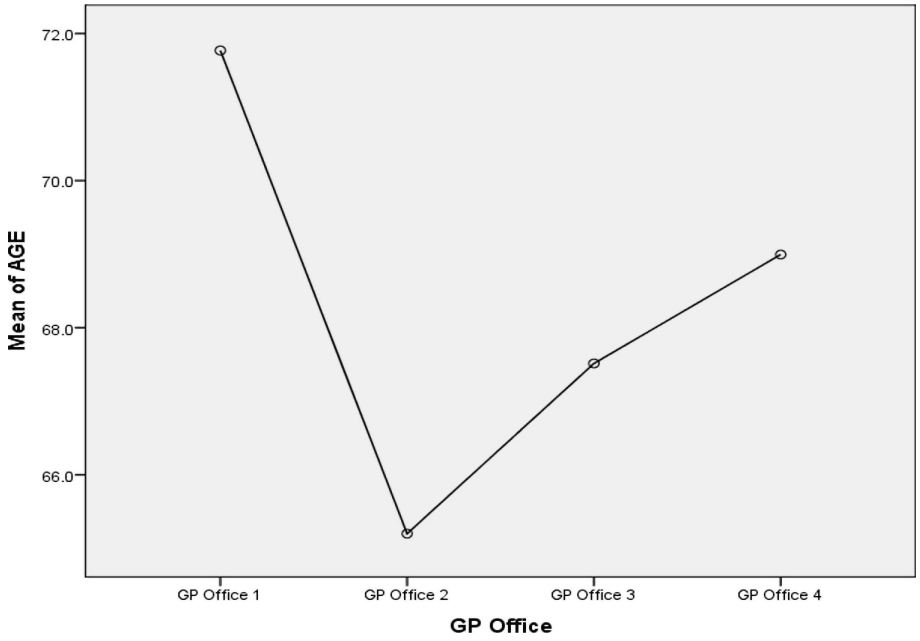

Table 1. Demographic data of participants (patients diagnosed with HTN) by GP office.

Among the patients with HTA monitored by the four GPOs included in our study, we have found that 47.7% are medication adherent, (i.e., 80% or above). We have also found that a percentage of 20.3% patients have 0 days covered by medication and 31.9% are somehow adherent, having had at least one prescription for at least one medication type during 2019 (Table 3).

The rates differ significantly between the four GPOs included (min= 34.5% rate; max=53.2%) as determined by One-Way ANOVA (F (3,1648) = 11.38, p = .00). The post-hoc analysis using Tukey's HSD test shows that GPO2 has a lower adherence rate than the other three GPOs, no other differences being significant, as it can be observed in Figure 2.

One factor that we analysed and that might have an impact on adherence rates is the duration of the prescription issued by the GP. The most frequent type of prescription issued was the longer duration one, valid for 3 months (23.3%) followed closely by the 1-month prescriptions (22.5%) (Table 4).

We found significant differences between the duration of the prescription and the adherence to medication treatment as determined by One-Way ANOVA (F (3,1648) = 534.49, p = .00). The post-hoc analysis using Tukey's HSD test shows that prescriptions issued for two (86.81%) and three months (86.32%) have higher adherence rates than prescriptions issued for one month (63.40%), as it can also be observed in Figure 3.

Another factor that might have an impact on the adherence rate is the age of the patients with HTN. In order to check this hypothesis, we have tested the association between adherence and age by using the Pearson correlation coefficient. We have found a positive correlation between the two variables, r = 0.342, n = 1647, p <0.01.

Discussion

The overall prevalence of 34% identified in our study is lower than the results reported in the SEPHAR III study, where the HTN prevalence in the adult population was 45.1%. This difference does not necessarily reflect a low prevalence specific to the area, but rather an underdiagnosis of the disease. Moreover, another explanation of this difference would be that the population of a large city might access more frequently private or specialized services rather than the general practitioners (GPs). Not to be neglected is the fact that in the current practice of GP in Romania, there is no active surveillance or mobilization of patients, and patients request family medicine services only when they need it.

There is also a correlation between the mean age of patients and the prevalence of HTN in a GP office. The lowest prevalence of HTN is at GPO 2, but the mean age is also lower. These data suggest that as they age, patients' concern for their health and responsibility increases, which will also be reflected in their medication adherence.

Table 2. Distribution of new cases by GP Office.

GP office	Old cases	New cases (2019)	Total
GPO1 (N/%)	508 (95.1%)	26 (4.9%)	534 (100.0%)
GPO 2 (N/%)	291 (92.1%)	25 (7.9%)	316 (100.0%)
GPO3 (N/%)	373 (94.0%)	24 (6.0%)	397 (100.0%)
GPO4 (N/%)	377 (93.1%)	28 (6.9%)	405 (100.0%)
Total	1549 (93.8%)	103 (6.2%)	1652 (100.0%)

Table 3. Adherence rate by GPO.

GP office	Non-adherent	Somewhat adherent	Adherent	Total
GPO1 (N/%)	88 (16.5%)	187 (35.0%)	259 (48.5%)	534 (100.0%)
GPO 2 (N/%)	109 (34.5%)	98 (31.0%)	109 (34.5%)	316 (100.0%)
GPO3 (N/%)	62 (15.7%)	129 (32.7%)	204 (51.6%)	395 (100.0%)
GPO4 (N/%)	76 (18.9%)	112 (27.9%)	214 (53.2%)	402 (100.0%)
Total	335 (20.3%)	526 (31.9%)	786 (47.7%)	1652 (100.0%)

Table 4. Frequency of prescription duration issued by GPO.

GP office	No prescription	1 month	2 months	3 months	Mixed
GPO1 (N/%)	88 (16.6%)	136 (25.6%)	76 (14.3%)	105 (19.8%)	125 (23.5%)
GPO 2 (N/%)	110 (34.8%)	46 (14.6%)	13 (4.1%)	106 (33.5%)	41 (13.0%)
GPO3 (N/%)	62 (15.7%)	103 (26.1%)	41 (10.4%)	72 (18.2%)	115 (29.1%)
GPO4 (N/%)	76 (18.8%)	85 (21.0%)	64 (15.8%)	101 (25.0%)	78 (19.3%)
Total	336 (20.4%)	370 (22.5%)	194 (11.8%)	384 (23.3%)	359 (21.8%)

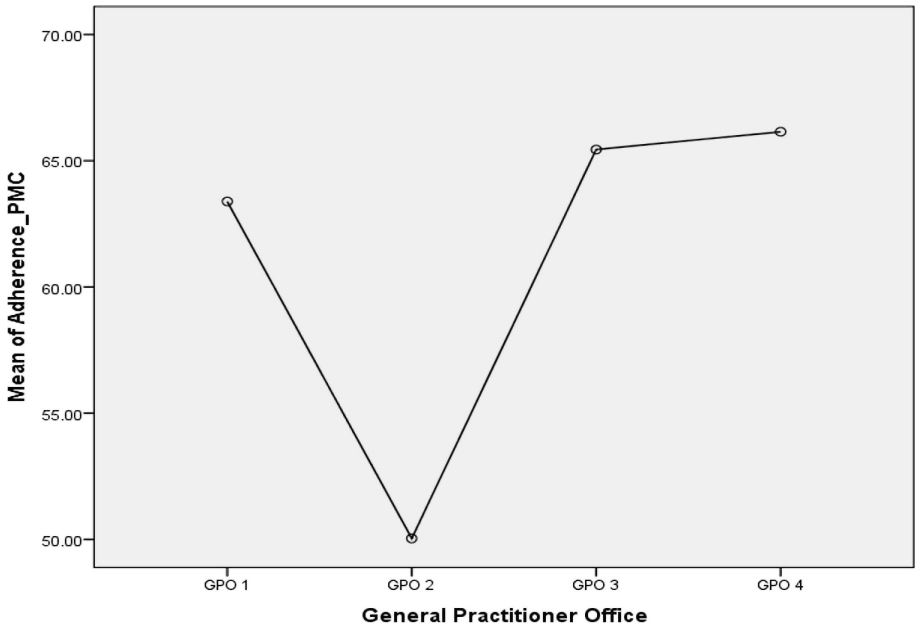

Figure 2. Adherence by GPO.

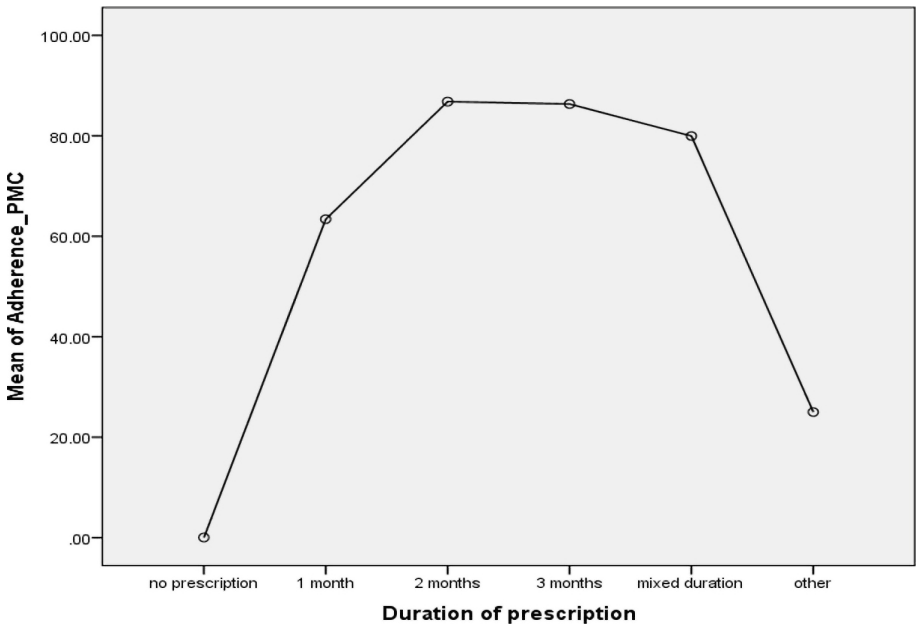

Figure 3. Adherence by prescription duration.

Our results also show that 79.7% of patients have an established treatment, but only 47.7% follow that recommendation and have a good adherence rate (i.e., 80% or above). However, one in five patients in our study have not been issued any prescription by the GP, and this issue should be further investigated. There are some patients that benefit from a prescription from a doctor of another specialty, and there are others who pay privately for the cost of their medication. Certainly, the proportion of patients with low or no medication adherence is concerning and requires prompt intervention.

Also, low medication adherence is likely to reflect a lack of health education for the population and perhaps a poor communication between doctor and patient. The fact that the bureaucracy is vast in the health system shortens the time spent by the doctor with his patients, and this impairs the control of the disease.

A very important result of the study is that patients who receive long-term prescriptions (3 months) have a significantly higher medication adherence than those who request prescriptions for one month. These results are consistent with the literature, which shows that extending the duration of the prescription is also a cost-effective measure, and it may be favored by the patients as well [10].

Conclusions

There are three major findings of this study: the underdiagnosis of HTN, low medication adherence, and the possibility of using long-term prescriptions to increase adherence.

These findings highlight the need to invest in patient education, to increase the active monitoring of patients, and to allocate sufficient time for efficient physician-patient communication.

Conflict of Interest

The author confirms that there are no conflicts of interest.

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