

# Knowledge of blood pressure self-control principles in hospitalized patients with hypertension

Znajomość zasad samokontroli ciśnienia tętniczego  
u hospitalizowanych chorych z nadciśnieniem tętniczym

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Lekarz Anna Kot jest absolwentką Wydziału Wojskowo-Lekarskiego Uniwersytetu Medycznego w Łodzi. Obecnie w trakcie szkolenia specjalizacyjnego z kardiologii, które realizuje w I Klinice Kardiologii i Elektroterapii Świętokrzyskiego Centrum Kardiologii w Kielcach pod kierownictwem prof. dr hab. n. med. Beaty Wożakowskiej-Kapłon. Klinika specjalizuje się w diagnostyce i leczeniu zaburzeń rytmu serca (implantacja stymulatorów, ICD, CRT, badania elektrofizjologiczne, ablacje). W kręgu zainteresowań medycznych dr Kot pozostają: hipertensjologia, diagnostyka nieinwazyjna chorób układu krążenia, farmakoterapia. W wolnym czasie zajmują ją podróże, muzyka oraz sport.

## Abstract

**Introduction.** Hypertension (HTN) is the main cause of mortality worldwide. Control of HTN is based on home blood pressure measurements. An important role in the diagnosis of HTN plays an ambulatory blood pressure measurement. The main aim of the study was to assess the knowledge of blood pressure measurements, as well as the assessment of knowledge about the disease in hospitalized patients with hypertension.

**Materials and methods.** The study involved a group of 126 patients with diagnosed and treated HTN hospitalized in the First Clinical Department of Cardiology in Świętokrzyskie Cardiology Centre in Kielce. Questionnaire consisted of 23 closed questions and 3 open questions was a study tool. It assessed demographic data, duration of HTN, lifestyle and the presence of comorbidities. Some of the questions concerned the knowledge of the principles of self-control of blood pressure and how to perform blood pressure measurements.

**Results.** Studied group of 126 patients with hypertension included 58 women (46%) and 68 men (54%). Only 26 patients (20.6%) in the whole group had normal body weight. The average duration of HTN was 11 years. One hundred and eighteen patients (93.7%) measured their blood pressure at home. Forty-three respondents (34.1%), used wrist sphygmomanometer. Among studied patients, 107 (85%) knew the correct blood pressure. Nineteen (15%) patients did not know the correct blood pressure values. Lifestyle of hospitalized patients with hypertension was also assessed. Healthy diet and eliminating risk factors since the diagnosis HTN were declared by 48 patients (38.1%), the remaining 78 patients (61.9%) did not make changes in their eating habits despite the occurrence of HTN. Most patients in the study group (95 patients, 75.3%) were aware of the consequences of untreated or inadequately treated HTN. The remaining 31 respondents (24.6%) had no knowledge of the subject. Assessing their level of knowledge, only 10 (7.9%) respondents defined it as good.

**Conclusions.** Knowledge of self-control of HTN in patients treated with antihypertensive drugs is insufficient. Systematic education is still necessary, mainly for country dwellers in old age.

Key words: hypertension, blood pressure measurements, self-control of hypertension

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## Introduction

According to World Health Organization (WHO), hypertension (HTN) is major cause of mortality worldwide; the prevalence of HTN among adults was 27% in the year 2000 [1]. Hypertension is the most important modifiable risk factor of cardiovascular diseases and may lead to atherosclerosis, myocardial hypertension with heart failure, chronic kidney disease and stroke [2].

The results of the NATPOL 2011 trial indicate that in Poland hypertension affects 9.5 million people, and other 9 million individuals have high normal blood pressure [3]. In the WOBASZ trial, the prevalence of HTN was 36% (33% in women and 42% in men) [4, 5]. HTN often remains undiagnosed, mainly because of its asymptomatic course. In some cases, the first manifestation of the disease is stroke or myocardial infarction [2].

In clinical practice, HTN control is based mainly on home blood pressure measurements. Significant role in diagnosis and effective treatment of HTN play office measurements and ambulatory blood pressure monitoring. However, office measurement may be falsely increased due to white coat effect and ambulatory blood pressure monitoring is not available for all patients. Self-measurements of blood pressure at home are important, because they allow for effective antihypertensive treatment.

The main objective of the study was to assess the knowledge of blood pressure measurements, as well as the assessment of knowledge about the disease in hospitalized patients with hypertension.

## Material and methods

The study involved a group of 126 patients with diagnosed and treated HTN hospitalized in the First Clinical Department of Cardiology in Świętokrzyskie Cardiology Centre in Kielce. Questionnaire consisted of 23 closed questions and 3 open questions was a study tool. It assessed demographic data (age, gender, place of residence), duration of HTN, lifestyle and the presence of comorbidities (atrial fibrillation, ischaemic heart disease, dyslipidaemia, thyroid disease). Some of the questions concerned the knowledge of the principles of self-control of blood pressure and how to perform blood pressure measurements. Criteria defined by the Polish Society of Hypertension were considered as proper principles of blood pressure measurements. For home blood pressure self-measurements, the use of validated, fully automated devices worn on the upper arm are recommended. The measurements should be performed on 7 consecutive days, twice daily, with two measurements per occasion taken a few minutes apart, performed at the same time in the morning and in the evening, with morning measurement before taking prescribed medications. The results should be recorded by the patients in a diary

**Table 1.** Demographic and clinical characteristics of the study population

Parameter	Overall N = 126	Men N = 68	Women N = 58
Age (mean)	67.7	66.3	69.5
Education			
Primary	36 (28.5%)	16 (23.5%)	20 (34.5%)
Secondary	55 (43.6%)	26 (38.2%)	29 (50.0%)
Tertiary (university)	14 (11.1%)	9 (13.3%)	5 (8.6%)
Vocational	21 (16.6%)	17 (25.0%)	4 (6.9%)
Economic status			
Good	31 (24.6%)	17 (25.0%)	14 (24.1%)
Moderate	81 (64.3%)	48 (70.6%)	33 (56.9%)
Poor	14 (11.1%)	3 (4.4%)	11 (19.0%)
Weight (mean)	77.7	81.2	73.6
Normal weight	26 (20.6%)	15 (22.1%)	11 (19.0%)
Overweight	61 (48.4%)	36 (52.9%)	25 (43.1%)
I degree obesity	36 (28.6%)	17 (25.0%)	19 (32.8%)
II degree obesity	3 (2.4%)	0 (0.0%)	3 (0.1%)
Mean duration of hypertension (years)	11	11	11.1

of self-control [3]. The questionnaire included questions assessing the knowledge of normal range of blood pressure values and blood pressure measurements, such as the type of blood pressure monitor used, patient position during measurements and the interval between last meal and the measurement.

## Results

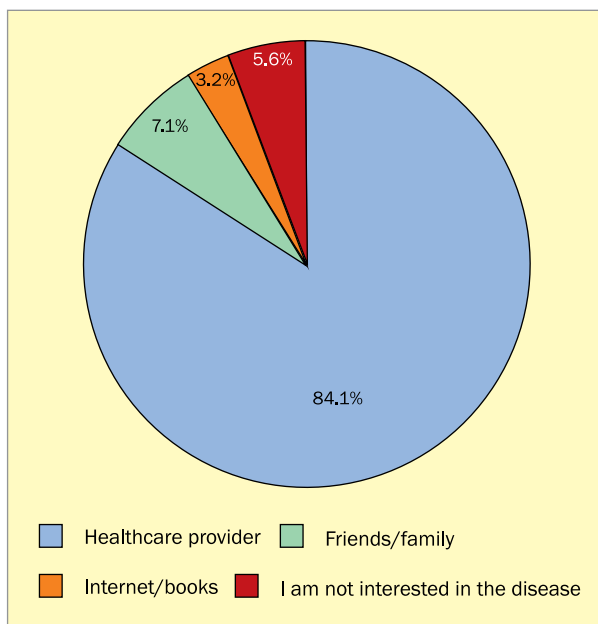
The study included 126 patients with HTN: 58 women (46%) and 68 men (54%). Table 1 presents demographic characteristics of the responders. Of note, only 26 patients (20.6%) in the studied group had normal body weight (Tab. 1).

Mean duration of HTN in the studied group was 11 years. In 70 patients (55.5%) HTN history was shorter than 10 years. The disease duration longer than 10 years was reported by 36 patients (28.5%), and 20 patients (16%) did not know the disease duration (16%).

Sources of information on HTN in the studied group are presented in Figure 1.

Table 2 presents the knowledge of HTN self-control among respondents.

In the studied group, 118 patients (93.7%) performed home blood pressure measurements. Surprisingly, as many as 43 respondents (34.1%) used wrist blood pressure monitors.



**Figure 1.** Sources of information on hypertension in the study population

Among studied population, 107 patients (85%) knew normal values of blood pressure, whereas 19 patients (15%) did not know the range of normal values of blood pressure.

The lifestyle of hospitalized patients with HTN was also assessed. Healthy diet and eliminating risk factors since the diagnosis HTN were declared by 48 patients (38.1%), the remaining 78 patients (61.9%) did not make changes in their eating habits despite the occurrence of HTN.

Most patients in the study group (95 patients, 75.3%) were aware of the consequences of untreated or inadequately treated HTN. The remaining 31 respondents (24.6%) had no knowledge of the subject.

The last question in the survey concerned the self-assessment of the knowledge about hypertension and its self-control. Only 10 patients (7.9%) assessed their knowledge as good.

### Discussion

Knowledge about HTN, need for hypotensive treatment and the principles of proper self-control with appropriately

**Table 2.** Hypertension self-control in the study population

Parameter	Overall N = 126	Men N = 68	Women N = 58
<b>Blood pressure measurement</b>			
Self-measurement	110 (87.3%)	57 (83.8%)	53 (91.4%)
By family member	5 (4.0%)	4 (5.9%)	1 (1.7%)
In outpatient clinic or pharmacy	3 (2.4%)	3 (4.4%)	0 (0.0%)
Not applicable (The patient does not measure the blood pressure)	8 (6.3%)	4 (5.9%)	4 (6.9%)
<b>The type of blood pressure monitor</b>			
Upper-arm monitor	75 (59.5%)	38 (55.9%)	37 (63.8%)
Wrist monitor	43 (34.1%)	26 (38.2%)	17 (29.3%)
Not applicable (The patient does not measure the blood pressure)	8 (6.3%)	4 (5.9%)	4 (6.9%)
<b>Body position during blood pressure measurements</b>			
Sitting position	115 (91.3%)	62 (91.2%)	53 (91.4%)
Any position	3 (2.4%)	2 (2.9%)	1 (1.7%)
Not applicable (The patient does not measure the blood pressure)	8 (6.3%)	4 (5.9%)	4 (6.9%)
<b>Interval between the meal and blood pressure measurement</b>			
Immediately after the meal	74 (58.7%)	35 (51.5%)	35 (51.5%)
Less than 30 minutes after the meal	31 (24.6%)	21 (30.9%)	10 (17.3%)
More than 30 minutes after the meal	21 (16.7%)	12 (17.6%)	9 (15.5%)

tailored pharmacotherapy improve HTN control and, as a result, the prognosis in these patients.

In our study, only 8% of the respondents assessed their level of knowledge about HTN as good. This was confirmed by the patients' answers to questions on that subject.

Self-measurements were performed by almost 90% of study participants. It seems that performing home blood pressure measurements by the respondents was associated with the duration of the disease that in about one third of the patients was longer than 10 years. The patients usually knew that the measurements should be performed in sitting position, but were not asked about such elements of correct blood pressure measurement as providing the back rest and hand support, placing the cuff on the heart level and not speaking during the measurement. Most of the respondents were not aware that an interval is needed between the meal and blood pressure measurement. Surprisingly, only 60% of the respondents used upper-arm monitors. In the studied group, 85% knew normal values of blood pressure.

It should be noted that data obtained from the participants in our study were inconsistent. On one hand almost all the patients knew normal values of blood pressure and performed home blood pressure measurements, but on the other hand significantly lower proportion of the respondents knew the principles of correct blood pressure measurement or used appropriate type of blood pressure monitor. Interestingly, only one in 12 patients assessed their knowledge about HTN as good. When searching for the reasons for insufficient knowledge of blood pressure self-control, both socioeconomic and health-related factors should be considered.

In our study, likewise in the paper by Backiel et al. [6], it can be noticed that the level of patients' knowledge of HTN is insufficient. The patients evaluated by Backiel et al. were younger than those in our study; mean age was 60 years compared with 67.7 years in our study. In both populations, most of patients lived in rural areas.

Most of the respondents had secondary (44%) and primary education (29%); 17% of respondents had vocational education. Only 11% of the responders had higher education. It can be noticed that the education level distribution is similar to that in the population analysed by Backiel which was also dominated by patients with secondary education. The percentage of the patients with higher education was low, which may be attributed to the fact that individuals with higher education are considerably less frequently hospitalized for cardiovascular diseases. Presumably, this results from better socioeconomic status, higher awareness of the consequences of untreated HTN and, subsequently, better care of own health and better treatment adherence, which allows for avoiding HTN complications that are frequent reason for hospitalization.

The main source of knowledge about HTN for the respondents was information obtained from their healthcare providers. Supposedly, low socioeconomic status and poor

education (most patients had secondary or vocational education) were the reasons for poor HTN self-control, despite the information provided by physicians.

The vast majority of the respondents did not change their lifestyle after HTN diagnosis, therefore blood pressure control was not always satisfactory, despite antihypertensive treatment. HTN management includes nonpharmacological strategies that may significantly improve blood pressure control. There are reports confirming that 25% of HTN patients do not take antihypertensive drugs prescribed by physicians [7]. Therefore, poor blood pressure control cannot be attributed to ineffectiveness of pharmacologic treatment or resistant HTN, while one fourth of patients does not take hypotensive drugs, takes them irregularly or takes only some of the drugs prescribed.

The data obtained in our study indicate that the knowledge about HTN, including the knowledge of self-control, remains insufficient. Patient education and prophylaxis of HTN and cardiovascular diseases are needed. The Polish Society of Hypertension has initiated a nationwide educational programme for HTN patients aimed mainly at the prevention of complications [8]. This programme provided the patients with the knowledge of self-measurements of blood pressure, pharmacotherapy of HTN and non-pharmacological strategies – overweight reduction with low-calorie diet, the need to reduce salt and alcohol consumption and benefits from regular moderate physical activity [8]. In the population evaluated for the effectiveness of the Polish Society Hypertension programme – both in the group that underwent education and in the control group – significant decrease in systolic and diastolic blood pressure values were observed. This confirms the need for systematic training and providing educational programmes to patients with HTN and their families.

Of note, patients with diabetes (about 1.5 million diabetic patients in Poland) participate in many educational events and are members of diabetic patient associations that provide continuous education on diabetes. Similar forms of educational activities for patients with HTN are not popular, although hypertension is considerably more prevalent than diabetes.

## Conclusions

The knowledge about HTN self-control among patients receiving antihypertensive treatment remains insufficient. Systematic patient education is necessary, particularly among those with low socioeconomic status, as described in our paper, i.e. mainly in patients living in rural areas and people of retirement age.

## Conflict of interest(s)

None declared.

## Streszczenie

**Wstęp.** Nadciśnienie tętnicze (HTN) stanowi główną przyczynę zgonów na świecie. Podstawą jego kontroli są domowe pomiary ciśnienia tętniczego. Ważną rolę w rozpoznawaniu HTN oraz leczeniu go odgrywają gabinetowe pomiary ciśnienia tętniczego oraz całodobowe monitorowanie ciśnienia. Głównym celem pracy jest ocena znajomości zasad pomiaru ciśnienia tętniczego, a także wiedzy na temat choroby u hospitalizowanych chorych z HTN.

**Materiał i metody.** Badaniem ankietowym objęto grupę 126 pacjentów z rozpoznanym i leczonym HTN hospitalizowanych w I Klinice Kardiologii i Elektroterapii Świętokrzyskiego Centrum Kardiologii w Kielcach. Narzędziem badawczym była ankieta złożona z 23 pytań zamkniętych oraz 3 pytań otwartych. Oceniano dane demograficzne, czas trwania HTN, styl życia oraz obecność schorzeń współistniejących. Część pytań dotyczyła znajomości zasad samokontroli ciśnienia tętniczego oraz sposobu wykonywania pomiarów ciśnienia.

**Wyniki.** Badana grupa 126 chorych z HTN obejmowała 58 kobiet (46%) oraz 68 mężczyzn (54%). Jedynie u 26 osób (20,6%) w całej badanej grupie stwierdzono prawidłową masę ciała. Średni czas trwania HTN wynosił 11 lat. W badanej grupie 118 chorych (93,7%) wykonywało domowe pomiary ciśnienia tętniczego. Spośród respondentów 43 osoby (34,1%) posługiwały się ciśnieniomierzem nadgarstkowym. Wśród badanych chorych 107 osób (85%) znało prawidłowe wartości ciśnienia tętniczego, z kolei 19 chorych (15%) nie wiedziało, jakie to wartości. Oceniono styl życia hospitalizowanych chorych z HTN. Zmianę diety oraz eliminację niekorzystnych nawyków żywieniowych od czasu rozpoznania HTN deklarowało 48 osób (38,1%), pozostałe 78 (61,9%) nie dokonało zmian w swoich nawykach żywieniowych w związku z występowaniem HTN. Większość chorych z badanej grupy, tj. 95 osób (75,3%), miało świadomość konsekwencji, które wynikają z nieleczenia lub niewłaściwego leczenia HTN. Pozostali ankietowani, tj. 31 osób (24,6%), nie mieli wiedzy na ten temat. Oceniając swój poziom wiedzy, jedynie 10 osób (7,9%) określiło go jako dobry.

**Wnioski.** Wiedza dotycząca samokontroli HTN u chorych leczonych hipotensyjnie jest niewystarczająca. Konieczna jest systematyczna edukacja chorych, dotycząca głównie mieszkańców wsi oraz osób w wieku emerytalnym.

Słowa kluczowe: nadciśnienie tętnicze, pomiaru ciśnienia tętniczego, samokontrola nadciśnienia tętniczego

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