Increasing the Effectiveness of Public Information on Risk Factors and Self-Control of Hypertensive Disease in Primary Link

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Abstract

The past 5-year data from 222 randomiy selected outpatient cards of hypertensive patients who were followed up at a family polyclinic (n=54) and in a number of rural ambulances (n=168) of the Republik of Uzbekistan were retrospectively analyzed. The physicians from the Tashkent family polyclinic and rural ambulances of a number of the Republic's regions, who had taken 10-month retraining courses for general practitioners, were questioned. Questionnaires were used to study 156 and 119 physicians before and after retraining, respectively. Two hundred and fifty-six hypertensive patients followed up at the family hospital and rural ambulances were interviewed using questionnaires and examined. Then some of them (a study group) took a course of training at a school for the hypertensive patient and the others (a comparison group) did not participate in the education program. All the patients were followed up for 2 years with a subsequent reexamination and study. Most outpatient cards give recommendations for non-drug treatment incompletely. In a number of cases, the physicians who attach importance to the detection and correction of risk factors has substantially increased after education. The patients who had taken training courses were found to be significantly ($p<0,001$) more aware of their having hypertension and the major risk factors of hypertensive disease, to be more adherent to treatment, and to know its adequacy.

Keywords: *Arterial hypertension, hypertensive disease, school for the hypertensive patient, patient education.*

Introduction

AH in the world affects about 1 billion people and more than 7.1 million deaths per year are associated with high blood pressure (BP)[1]. According to WHO, about 20% of the world's adult population have problems associated with high blood pressure. Alarming forecasts of WHO experts have been published, according to which, by 2025, a peak in the growth of arterial hypertension (AH) is expected, the incidence of which will reach 29%[2]. adult population of the planet. As a result of a targeted health policy in the second half of the last century, a significant reduction in mortality from CVD was achieved in the countries of North America, Western Europe, Japan and Australia[3]. So, in

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1976-1980. in the American population, the number of patients receiving treatment was 31% of all patients with hypertension, and in 2004-2009 already 59%. Control of blood pressure (at a level below 140/90 mm Hg) for the same period was 10% and 34%, respectively [4]. In the CIS countries, the epidemiological situation correlates with global data. Studies conducted in different regions of Russia over the past 20 years indicate that hypertension remains one of the most common diseases. About 30 million people suffer from it, which makes up 20% of the total population[5]. Given the main role of hypertension in the development of coronary heart disease (CHD) and stroke, control of blood pressure becomes an important task for healthcare systems in the vast majority of countries[6]. The widespread prevalence of CVD risk factors is due to the modern pace and lifestyle, characterized by stress, physical inactivity, smoking, excessive salt, calorie intake, insufficient consumption of fruits, vegetables and potassium [7].

The importance of the study of hypertension is directed by the efforts of many clinical studies in Europe and the USA [8]. According to N. Engl (2015), only 5–10% of hypertensive patients in Europe and 25.6% in the United States achieved BP control[9]. Global urbanization and social insecurity lead to the launch of one of the diverse pathogenetic mechanisms for increasing blood pressure - psychoemotional stress[10]. As the Framingham study showed, tachycardia accompanying stress not only contributes to the progression of atherosclerosis, but also increases the incidence of significant cardiovascular complications (CVC) of myocardial infarction (MI), cerebral stroke (CS), and sudden coronary death [11]. According to Russian scientists, psycho-emotional stress activates the sympathoadrenal system and the hypothalamic-pituitary-adrenal axis, creating conditions for chronic inflammation (C-reactive protein, tumor necrosis factor, interleukin-1B, interleukin-6), leading to oxidative stress followed by dissonance between vasoconstriction. and vasodilators, which is manifested by hypertension[13].

The purpose of the study is to increase the effectiveness of prevention and treatment of AH by educating patients in hypertensive schools at the level of the primary health care (PHC). To achieve the goal, the following tasks were formulated: to study patient management tactics, the knowledge of general practitioners about the principles of prevention and treatment, as well as the commitment of patients with hypertension to compliance with non-pharmacological and medical recommendations at the PHC level; to develop a structured program for the education of patients with hypertension with information interventions in the conditions of city family clinic/rural medical center (CFC/RMC); compare the results of patient adherence to treatment, analyze the results of therapeutic and preventive interventions before and after 24 months. observations; the creation of an electronic program of dispensary monitoring of patients with AH in primary care settings.

Materials and Method

A retrospective analysis of data (over the past five years) of 222 randomly selected outpatient records of patients with hypertension, registered in the joint venture (n=54) and in some Polyclinics of the Republic of Uzbekistan (n=168) was performed. Data from a retrospective analysis of outpatient maps are compared with the results of examination of patients (interrogation, examination, anthropometry, blood pressure measurement, determination of cholesterol, etc.). Interviewed by doctors of the Tashkent polyclinic and medical centers in rural areas of the republic, who took 10-month retraining courses for general practitioners. A survey of 156 doctors before training and 119 doctors after training was conducted, as well as a survey and examination of 236 patients with hypertension, consisting of a follow-up in polyclinics and medical centers. In the future, part of them (the main group; n=122) took a course at the school of hypertensive patients, and part (comparison group; n=114) did not participate in the educational program. All patients were under our supervision for 2 years with subsequent re-examination and examination. In the main group (age of patients from 45 years to 71 years, average - 51.75±1.85 years; 29.5% of men, 70.4% of women), the distribution of patients by stages was as follows: stage I AH - 45 (36, 8%) people; Stage II - 62 (50.8%); Stage III - 15 (12.2%). The crisis course of the disease was observed in 40 (32.7%) patients. The comparison group consisted of 114 patients (80 (70.1%) women and 34 (29.8%) men, aged 44-75 years, average - 52.6±1.62 years), treated by the traditional method and not participating in the educational program. In this group, stage I GB was detected in 41 (35.9%) people; Stage II - 61 (53.5%); Stage III - 12 (10.5%) people. The crisis course of the disease was observed in 37 (32.4%) patients. The groups were comparable in terms of the main clinical and laboratory instrumental indicators.

In the main group of patients, 46 (37.7%) patients had an average risk of cardiovascular complications, 63 (51.6%) were at high risk, and 14 (11.4%, $p < 0.05$) were very high. In the comparison group - 41 (35.9%), 62 (54.3%) and 11 (9.6%, $p < 0.05$) patients, respectively.

Schools of hypertension are organized on the basis of the Training and Medical Center at the Tashkent Medical Academy, located in SP 32 of Tashkent and RMC of two regions of the republic; teaching materials are developed taking into account the specifics of the work of family doctors. When compiling the training technology, the level of patient education was taken into account. In our opinion, taking into account the mentality of our population, 10 classes can be considered optimal (1 time per week, preferably on Saturday). Training material should be submitted in accordance with a structured program in a logical sequence according to the sections specified in the training program.

When organizing schools of hypertension, it is necessary to adhere to the following method of conducting classes: a set of patients in groups of 10-12-14 people; Venue - specially prepared thematic room; necessary resources for training: banners, a multimedia projector, phantoms, scales, a height meter, a measuring tape, an apparatus for measuring blood pressure, etc.; presentation of material - interactive conversation-lecture; duration of classes 90-120 minutes with a 15-20 minute break;

Students must be persuaded to keep a diary of patient self-control with the assessment and monitoring of controlled risk factors, the results of blood pressure indicators and a schedule for taking antihypertensive drugs. In order to acquire practical skills for self-monitoring and self-help with an acute increase in blood pressure, pay special attention to classes where patients learn the principles of non-drug and drug treatment of hypertension. To teach the methodology of independent outpatient daytime measurement of blood pressure, pulse counting and other practical skills (determining BMI, staffing an emergency first-aid kit and providing self-help with an acute increase in blood pressure), in order to adequately control blood pressure indicators. This method allows you to assess changes in blood pressure and heart rate in the early morning and during the day several times before going to bed, is easy for the patient, informative and increases patient adherence to treatment, allows you to control the effectiveness of antihypertensive therapy.

Self-ambulatory daytime monitoring of blood pressure is recommended as a mandatory method for the study of hemodynamics on an outpatient basis in assessing the effectiveness of antihypertensive therapy, in the diagnosis of hypertension, especially in hypersensitive patients with high levels of anxiety and depression, as well as in patients without any symptoms.

Results and Discussion

A retrospective analysis of risk factors recorded in the outpatient records of the clinic (n=54) and medical stations (n =168) yielded the following results: burdened heredity was established in the clinic in 34 (62.9%) cases and in medical centers in 88 (52.3%), smoking - in 16 (29.6%) and 47 (27.9%) cases, overweight - in 18 (33.3%) and 35 (20.8%), alcohol abuse - in 9 (16.6%) and 37 (22.0%), hypercholesterolemia - in 21 (38.8%), stress - in 38 (70.3%) and 115 (68.4%), respectively. The most common risk factors such as burdened heredity, stress, overweight, and lack of exercise.

In most outpatient cards, recommendations for non-drug treatment are not given in full. Table salt restriction is recommended by 35 (64.8%) polyclinic doctors and 53 (31.5%) rural doctors; auto-training - 24 (44.4%) and 64 (38.0%); restriction of fat intake - 31 (57.4%) and 71 (42.2%) and 54 (32.1%); weight loss in obesity - 37 (68.5%) and 71 (42.2%); regular physical education - 37 (68.5%) and 67 (39.8%), respectively. A comparative analysis of retrospective indicators of outpatient charts with data from an oral survey of doctors and examination of the same patients revealed a significant discrepancy ($p < 0.001$) of these risk factors. These data allow us to conclude that in most patients the timely detection and correction of risk factors for hypertension were not performed.

Studying outpatient cards, we drew attention to the rules for the appointment of antihypertensive drugs with proven effectiveness. β-Adrenergic blockers in the clinic are prescribed in 44.4% of cases, in medical centers - in 8.9%; diuretics - in 35.1 and 10.7%, respectively; calcium antagonists - in 24 and 5.9%; ACE inhibitors - in 51.8 and 42.2%, respectively. Despite the appointment of first-line antihypertensive drugs, dibazole, Adelfan, Raunatin, etc. were also prescribed, in courses, without a specific regimen and duration of administration. Antihypertensive drugs are regularly prescribed by 35 (64.8%) doctors of the polyclinic and 30 (17.8%) by medical points, by short courses - 19 (35.1%) and 138

(82%) doctors, respectively, the differences in both cases are highly significant (p <0.001).

Anonymous questionnaire of doctors at the polyclinic and medical centers that underwent 10-month retraining courses revealed an underestimation of risk factors and their correction by doctors in patients with hypertension. After training, the number of doctors who attach importance to the identification and correction of risk factors significantly increased (p<0.001). Thus, 46.0% of polyclinic doctors and 30.1% of medical centers recommended a decrease in salt intake before training, 92.3 and 76.1% respectively, after training; weight loss before training - 26.9 and 15.0% of doctors, after - 96.1 and 85.0%, respectively; restriction of fat intake was recommended before training by 20.6 and 16.1% of doctors, after - 94.2 and 43.2%, respectively.

Most doctors do not fully understand the method of modern prevention of hypertension. Reducing the negative factors associated with lifestyle is the main goal of preventing hypertension, an effective way to reduce blood pressure and prevent complications. The role of the general practitioner in convincing patients to follow simple recommendations is extremely large.

236 patients were enrolled in a questionnaire survey of patients under clinical observation for AH. When analyzing questionnaires, the following groups of signs were evaluated: patient awareness of hypertension, blood pressure levels, its complications; the ability to provide self-help with a sharp increase in blood pressure; knowledge of non-drug method of treating AH; possession of practical skills (independent measurement of blood pressure, determination of heart rate, etc.); attitude to taking antihypertensive drugs.

Patients participating in the educational program significantly (p <0.001) improved their knowledge of risk factors and practical skills to improve the quality of AH control (Table 1). In the group of patients who did not undergo training, a special difference in the provision of self-help before being taken under observation and after 2 years of observation was not detected. All 122 patients who completed the training mastered the skills of independent measurement of blood pressure and pulse counting. In the comparison group, these indicators remained almost unchanged. Repeated questionnaires after training showed a significant (p <0.001) increase in the number of patients taking antihypertensive drugs, 82.7% of those trained began to "constantly" and "from case to case" with an excessive increase in blood pressure - 9.0% of trained patients.

The majority of patients in the comparison group do not possess self-help skills with a sudden increase in blood pressure and self-monitoring of blood pressure. In addition, one of the principles of drug antihypertensive therapy (taking drugs with regularity and duration) is not supported. After 2 years of observation, the rules for taking antihypertensive drugs almost did not change. The results of a survey of patients prove the need for training AH patients in a number of skills that allow them to provide self-help in a timely manner with an acute increase in blood pressure and maintain its target level while observing non-pharmacological treatment method and rules for taking antihypertensive drugs.

One of the main links of the ongoing measures for the prevention of hypertension on an outpatient basis should be the increase in the educational level of patients. If a general practitioner takes the time and develops an individual program for non-drug and drug treatment for each patient, then it will be very difficult to implement it, since untrained patients lack motivation for treatment. Only after informing about the principles of prevention of AH and its complications does the patient increase adherence to treatment, they become responsible for their health. The school of hypertensive patients at the PHC level is an ideal and suitable method for increasing the knowledge, abilities and skills of patients for quality control and monitoring of their condition.

Among the factors affecting the effectiveness of treatment of patients with hypertension, along with the clinical features of the course of the disease and the correctness of medical prescriptions (choice of drug, dose, dosage regimen, etc.), the adherence of patients to treatment is of great importance, i.e. completeness and correct implementation of medical recommendations.

Patients who underwent training experienced positive dynamics in the lipid spectrum: the number of patients with hypertriglyceridemia (p <0.001) and hyper-LDL cholesterol (p <0.001) decreased (Table 2). All patients stopped drinking alcohol (p <0.001), quit smoking; physical inactivity was observed only in 30.3% (p <0.001). The number of patients with impaired glucose tolerance decreased (p <0.001).

Table 1: Comparative results of a questionnaire survey of patients, before and after 2 years of observation

Relevant Question	Core group before training (n=122)		The main group after training (n=122)		Comparison group source data (n=114)		After 2 years of follow-up (n=112)	
	Abs.	%	Abs.	%	Abs.	%	Abs.	%
Can you help with an acute increase in blood pressure?								
• Yes	21	17,2	120	98,3	23	20,1	28	25,0
• No	101	82,7	2	1,6	91	79,8	84	75,0
Do you know how to measure blood pressure on your own?								
• Yes	45	36,8	122	100,0	34	29,8	41	36,6
• No	77	63,1	-	-	80	70,1	71	63,3
Do you know how to independently determine your heart rate?								
• Yes	8	6,5	122	100	6	5,2	6	5,3
• No	114	93,4	-	-	108	94,7	106	94,6
Do you think that overweight affects blood pressure?								
• Yes	28	22,9	122	100	29	25,4	34	30,3
• No	67	54,9	-	-	44	38,5	40	35,7
• I do not know	27	22,1	-	-	41	35,9	38	33,9
Do BP indicators change with age?								
• Yes	24	19,6	122	100,0	21	18,4	29	25,8
• No	29	23,7	-	-	32	28,0	24	21,4
• I do not know	69	56,5	-	-	67	58,7	59	52,6
Do you know about acute and chronic complications of AH?								
• Yes	87	71,3	122	100,0	79	69,2	80	71,4
• No	35	28,6	-	-	35	30,7	32	28,5
How do you take medicine for pressure?								
• Constantly	14	11,4	101	82,7	12	10,5	29	25,8
• From case to case (with an increase in blood pressure)	89	72,9	11	9,0	79	69,2	67	59,8
• Short courses (10-14 days)	19	15,5	-	-	23	20,1	16	14,2

Table 2. Dynamics of controlled risk factors for cardiovascular diseases in patients trained at the school of hypertension

Risk factors	Data before training (n=122)		2 years after training (n=122)		ρ
	Abs	%	Abs	%	
Excessive intake of salt more than 5-6 g/day	10	8,1	3	2,4	<0,001
Smoking	13	10,6	5	4,0	<0,001
Alcohol abuse	11	9,0	-	-	
TG> 2.0 mmol/L	24	19,6	14	11,4	<0,001
LDL cholesterol> 3.0 mmol/L	69	56,5	33	27,0	<0,001
HDL cholesterol <1.0 mmol/L	42	34,4	24	19,6	<0,001
Impaired glucose tolerance	12	9,8	2	1,6	<0,001
Sedentary lifestyle	85	69,6	37	30,3	<0,001

Significant changes in the clinical picture of the disease were also noted: dizziness and headaches began to occur less frequently ($p < 0.001$), there was a tendency to decrease dyspnea during exercise ($p < 0.001$) (Table 3). The number of patients suffering from angina pectoris, as well as those with rhythm disturbances, has not increased.

Table 3. Change in symptoms of hypertension in patients trained at the school of hypertension

Clinical symptoms	Before training (n=122)		2 years after training (n=122)		ρ
	Abs	%	Abs	%	
Dizziness	42	34,4	5	4,0	<0,001
Headache	91	74,5	5	4,0	<0,001
Exertional dyspnea	16	13,1	6	4,9	<0,001
No angina pectoris	71	58,1	71	58,1	>0,05
FC I	30	24,5	33	27,0	>0,05
FCII	21	17,3	18	14,7	<0,05
Heart rhythm disturbances, incl. ventricular and supraventricular extrasystole, atrial fibrillation	14	11,4	14	11,4	>0,05

Trained patients significantly (p <0.001) increased the use of long-acting antihypertensive drugs; ACE inhibitors - from 19.6 to 91.8%; β-blockers - from 29.5 to 39.3%; calcium antagonists - from 6.5 to 59.0%; diuretics - from 13.1 to 66.3%, respectively. Blockers of AT-1 receptors before training were taken in 5.7% of cases; after 2 years of observation, the frequency of administration of these drugs significantly (p <0.001) increased and amounted to 13.1%.

Patients trained in the school of hypertension have a significant (p <0.001) improvement in knowledge of AH risk factors and their knowledge of hypertension, increased adherence to treatment and drug treatment to achieve the target blood pressure level (Table 4). The course of AH was accompanied by a significant decrease in the frequency of hypertensive crises and hospitalization, side effects of drug therapy. In the comparison group, against the background of the prescribed therapy, positive reliable dynamics were noted; patients began to control blood pressure more often, the selection of adequate drug therapy improved, although patient awareness of the presence of hypertension, patient knowledge of the main risk factors for AH, treatment adherence remained low, and the decrease in the number of hypertensive crises was not significant.

Table 4. The main results of the observation of patients who have passed and have not been trained at the school of hypertension

Index	Main group				p	Comparison group				p
	Before training (n=122)		After training (n=122)			Initial data (n=114)		After 2 years of follow-up (n=112)		
	Abs	%	abs	%		abs	%	Abs	%	
AH awareness	66	54,0	121	99,1	<0,001	71	62,2	75	66,9	>0,05
Patient knowledge of the main risk factors for GB	56	45,9	121	99,1	<0,001	36	31,5	38	33,9	>0,05
The incidence of hypertensive crisis	40	32,7	4	3,2	<0,001	42	36,8	37	33,0	>0,05
Hospitalized for emergency	40	32,7	4	3,2	<0,001	42	36,8	37	33,0	>0,05
Permanent independent monitoring of blood pressure	63	51,6	118	96,7	<0,001	25	21,9	32	28,5	<0,001
Drug treatment of hypertension with achieving the target level of blood pressure	14	11,4	101	82,7	<0,001	12	10,5	29	25,8	<0,001
Adherence to treatment	87	71,3	120	98,3	<0,001	24	21,0	25	22,3	>0,05
Side effects of drug treatment of AH	38	31,1	5	4,0	<0,001	40	35,0	38	33,9	>0,05

It should be noted that 118 (96.7%) patients began to independently control blood pressure according to the SADMAD technique and keep a self-monitoring diary, which contributed to increasing adherence to drug therapy, and improved the relationship between the doctor and the patient.

The most difficult thing for patients was the conscious implementation in practice of such measures to normalize a lifestyle as reducing body weight, increasing physical activity, observing the principles of a balanced diet, restricting the use of salt, quitting smoking, and alcohol abuse. After 2 years, 48 (39.3%) patients increased physical activity, 49 (40.1%) - limited the consumption of table salt. Of the dietary recommendations for 98 (80.3%) patients, limiting the intake of animal fats and an increase in the diet of unsaturated fats were easily feasible. In general, these measures were accompanied by a decrease in blood cholesterol, a decrease in the number of patients with impaired glucose tolerance.

The role of independent ambulatory daytime monitoring of blood pressure (SADMAD) in the formation of adherence to treatment was revealed. In the main group of SADMAD in the amount of 10 measurements per day 51 (41.8%) patients performed; 6 measurements per day - 35 (28.6%); 4 measurements per day - 22 (18.0%); 2 measurements per day - 10 (8.1%). SADMAD was carried out before prescribing drugs and against the background of antihypertensive treatment.

After reaching the target level of blood pressure during therapy, subsequent examinations for patients with medium and low risk who regularly measure blood pressure at home should be planned at intervals of 6 months. For patients with a high and very high risk, as well as for patients receiving only non-drug treatment, and for people with low adherence to treatment, the intervals between visits should not exceed 3 months. The regularity of medical examinations that ensure continuous monitoring can be ensured by involving patients in activities related to training and the acquisition of self-control skills.

Treatment of a patient with hypertension is carried out continuously, in most patients - for life, since its cancellation is accompanied by an increase in blood pressure. With persistent normalization of blood pressure for 1 year and compliance with measures to change the lifestyle of patients with low and medium risk, a gradual decrease in the number and/or reduction of doses of antihypertensive drugs is possible. Reducing the dose and/or reducing the number of medicines used requires an increase in the frequency of visits to the doctor and the administration of SADMAD at home in order to ensure that there are no repeated increases in blood pressure.

It should be noted that in a number of scientific papers it has been noted that the effectiveness of educational programs has recently been declining[14]. They only temporarily improve the situation [15], help control blood pressure, but do not affect other risk factors, for example, body weight [17].

Conclusion

1. At the primary care level in most patients with hypertension, risk factors are not fully identified; some of them do not correct the identified modifiable risk factors; the vast majority of patients use antihypertensive drugs in short courses, not observing the regularity and duration of admission.
2. Patients with hypertension are not sufficiently aware of the risk factors (33.9%) that affect the course and prognosis of the disease: do not have the skills of self-control (63.3%) and self-help (75%) with an acute increase in blood pressure; there is a low commitment (24%) of patients to the implementation of medical recommendations.
3. Antihypertensive therapy in patients with hypertension not participating in the educational program does not significantly affect controlled CVD risk factors and does not lead to the achievement of target blood pressure levels (29%).
4. The school of hypertensive patients is an effective system for organizing patient education and conducting complex therapy in the clinic and medical centers; significantly contributes to the prevention of CVD, adequate control of systolic and diastolic BP (96.7%).
5. Adequate pharmacotherapy is optimally possible in patients participating in the educational program. In our study, this training allowed us to achieve the target blood pressure level in 82.7% of patients, reduce the pharmacological burden on the body, and thereby reduce the number of adverse reactions to drug therapy.
6. Due to the insufficient development of personal programs for the follow-up of patients with AH, the

effectiveness of treatment is reduced, the course and prognosis of the disease are aggravated, leading to a deterioration in the quality of life and an increase in the cost of treatment.

7. The introduction of an electronic dispensary monitoring program facilitates the implementation of treatment and prophylactic measures, allows to identify the leading CVD risk factors, and conduct their timely correction and monitoring. With the help of such programs, patients with lesions of target organs and ACS are detected at the early stages of their development, which allows for adequate treatment and prevention of severe complications of hypertension.

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