

## Original Article

# Hypertension status and adherence to treatment among Ukrainian and Egyptian patients

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### Abstract

Hypertension is the third-largest killer in the world, about 1 in 8 deaths worldwide is due to hypertension. The WHO estimates that nearly 1 billion people are affected by hypertension. This study aims to review the essential hypertension status among the Egyptian and Ukrainian adult population, the practice of the utilization of hypotensive drugs, and adherence to treatment in patients with hypertension. A population of 120 patients with hypertension was enrolled in the study. General and systemic examination, laboratory and instrumental investigations were done for all participants. All subjects completed a questionnaire. A comparative analysis of the socio-demographic profile, awareness of complications of hypertension and blood pressure level meaning, pharmacotherapy of arterial hypertension, adherence to treatment and relationship to long-term medication and diet of Ukrainian and Egyptian participants was performed. The majority of Ukrainian and Egyptian participants started medication as soon as diagnosed with hypertension. The use of ACEI/ARBs surpassed the use of all other classes of antihypertensives among both groups. A high level of regular antihypertensive therapy with an understanding to complete the prescription was detected; on the other hand, a significant frequency of changes or refusal of therapy, in general, was established.

**Keywords:** hypertension, pharmacotherapy, participants, drugs, compliance.

### Introduction

Hypertension (HTN) is a major health problem throughout the world because of its high prevalence and its association with increased risk of cerebrovascular accidents (CVA), congestive heart failure (CHF), coronary artery disease (CAD), end-stage renal failure (ESRF) and sudden death [1-3]. The World Health Organization estimates that nearly 1 billion people are affected by HTN. It is the third-largest killer in the world, about 1 in 8 deaths worldwide is due to hypertension. High blood pressure values in the presence of several risk factors (obesity, diabetes mellitus, increased salt intake, hyperlipidemia, smoking, lack of physical activity, psychological factors, advanced age

and sex) lead to a further increase in cardiovascular disease risk [2-4].

Hypertension is a common chronic disease amenable to regulation by appropriate medication or adopting relevant lifestyle modifications. However, a scarcity of data about the severity of the disease and, therefore, the importance of adhering to the prescribed treatment, long-term drug regimens, complex regimens that need numerous medications with varying dosing schedules, cost and a scarcity of motivation to form some lifestyle changes in terms of diet and workout may constitute barriers to compliance behavior.

This study aims to review the essential hypertension status among the Egyptian and Ukrainian adult population, the practice of the utilization of antihypertensive



drugs of various pharmacological groups within the condition of the therapeutic hospital in Ukrainian and Egyptian patients, and adherence to treatment in patients with HTN in Ukraine and Egypt.

## Material and methods

### Study design and patients

It was a study done among 60 patients attending the clinic of an International Hospital in Egypt for HTN management. The analysis of 60 cases of hospital patients treated in Ternopil Clinical Hospital 3 with a hypertension disease II stage diagnosis was performed. Patients were homogeneous in age, stage of disease and duration of illness. The study protocol conformed to the ethical guidelines of Helsinki's Declaration and was approved by the Bioethics Commission of I. Horbachevsky Ternopil State Medical University (Protocol 24, dated 27.08.2014).

All subjects completed a questionnaire that included personal, socio-demographic, and medical data. The following data were analyzed through general and systemic examination: systolic and diastolic blood pressure, heart rate, and body mass. Laboratory investigations were performed, including complete blood count (CBC), fasting blood glucose and measurement of creatinine, uric acid, and lipid profile. Microalbuminuria was also assessed. Other investigations, including electrocardiogram and echocardiography, were done. The number and type of hypotensive drugs or drug combinations were analyzed.

### Statistical analysis

The present study possesses the characteristics of an observational, retrospective research performance based on the information obtained by analyzing the observation sheets of patients diagnosed with hypertension. Descriptive results were expressed as frequency, percentage, and mean±SD.

## Results

The socio-demographic profile of Egyptian participants shows that the mean age is 57.3±9.8 years. More than half of the participants (51.7%) are in the age group of 45–60 years, 38.3% are aged 60 and more, and 10% at the age group of 15–45 years. Considering gender,

56.7% of the participants are females, while 43.3% are males. Participants' residing urban area is 51.7% while 48.3% are from rural. Regarding the level of education, about half (53.4%) of the participants can read, write, or illiterate; 23.3% completed secondary school, 13.3% graduated from university or higher education, and 10% completed their elementary education (primary or preparatory). The majority of the participants (85%) do not know the meaning of HTN, 46.7% do not know the normal BP level, while 69.7% know symptoms of high BP. Regarding knowledge about risk factors that can cause high BP; 78.3% of participants know excess weight gain as a risk factor, 95% know that excessive salt intake is a risk factor, 90% know that excessive coffee or tea drinking is a risk factor for HTN and 66.7% know that smoking is a risk factor for HTN.

In this study, the majority of Egyptian participants are aware of complications of HTN as stroke, heart failure, heart attack, and renal failure, with rates of 88.3%, 90%, 90%, and 68.3%, respectively. Also, 83.3% of them know that HTN can be prevented by changing their lifestyle. It is used to classify participants into those who know HTN (48.3%) and those who do not know, representing 51.7%.

The majority of participants (83.3%) get their information about high BP from health worker (doctor, nurse, and midwife) compared to 6.7% from their friends, 5% from relatives, 1.7% from the pharmacy and 3.3% from others like their neighbors, colleagues or mass media. The majority (85%) of participants started medication as soon as diagnosed with HTN.

On asking about doses of medication skipped during the past three days, 75% of participants did not skip any medication, 13.3% skipped one dose, 3.3% skipped two doses, and 8.4% skipped three or more doses.

The study shows that 13.3% of Egyptian participants are current smokers, 11.7% are ex-smokers, and 75% are not smokers. The majority of the participants (93.3%) are exposed to stress and excess salt intake is practiced by 88.3% of the participants. Inquiring about family history of chronic diseases; 55.1% have a family history of HTN.

Considering the socio-demographic profile of Ukrainian participants, including males 32 (53.3%) and females 28 (46.7%), the mean age is 59.4±8.8 years. Approximately the same number of patients are in the age group 45–60 years (42.5%), aged 60 and more 41.3%, and 16.2% in the age group 15–45 years. As you can see from the information above, hypertension disease occurs more often in males than females. The highest level of male morbidity occurs at 40–49 years old and for

females at 60–69 years old. In older women, you can find more frequently increasing blood pressure (in particular systolic) and pulse pressure caused by menopause.

Participants' residing urban areas are 56 (93.3%), while 4 (6.6%) are from rural. Regarding the level of education, 29 (48.3%) graduated from university or higher education, and 31 (51.7%) completed their elementary education or secondary school.

The 68% of Ukrainian participants do not know the meaning of HTN, 50.2% do not know the normal BP level, while 81.3% know symptoms of high BP. Regarding knowledge about risk factors that can cause HTN; 88.6% of participants know excess weight gain as a risk factor, 97% know that excessive salt intake is a risk factor, 90% know that excessive coffee or tea drinking is a risk factor for HTN and 70.7% know that smoking is a risk factor for HTN.

Study shows that Ukrainian participants are aware of complications of high BP, such as stroke, heart failure, heart attack, and renal failure, with rates of 90.3%, 89%, 90% and 72.3%, respectively. Also, 85.6% of them know that HTN can be prevented by changing their lifestyle. The participants were classified into those who know HTN (52.3%) and those who do not, representing 47.7%.

The majority of Ukrainian participants (86.8%) get their information about high BP from health workers compared to 3.5% from their friends, 4% from relatives, 3.2% from the pharmacy and 2.5% from others. The majority (87%) of participants have started medication as soon as diagnosed with HTN. On asking about doses of medication skipped during the past three days, 69.2% of participants did not skip any medication, 15.5% skipped one dose, 10.1% skipped two doses, and 5.2% skipped three or more doses.

Study shows that 55.3% of Ukrainian participants are current smokers, 20.7% are ex-smokers and 24% are not smokers. The majority of the participants (95.6%) are exposed to stress, excess salt intake is practiced by 61.4% of the participants and 67.6% have a family history of HTN.

In the examined patients, the following symptoms were most common: instability of blood pressure, headache, dizziness, general weakness, dyspnea during doing sports and walking, cardiac pain syndrome and burning sensation.

Therapy of arterial hypertension in all-Ukrainian patients consisted of the following groups of drugs: beta-blockers (25% of patients); diuretics + ACE inhibitors (36.7%); diuretics + angiotensin II receptor blockers (11.7%); ACE inhibitors + calcium channel blockers

(26.7%). The proportion of patients treated with ACE inhibitors/ARBs was 75.1% (ARBs 11.7%),  $\beta$ -blockers – 25%, the number of patients receiving diuretics was 48.4%, and calcium channel blockers – 26.7%.

Regarding the pharmacotherapy of HTN in Egyptian patients, 32% (6% as monotherapy) of Egyptians were treated with diuretics, the lowest cost class of antihypertensives;  $\beta$ -blockers, calcium channel blockers and ACEI/ARBs were used in 25% (9%), 33% (13%), 53% (21%), respectively; taking 3 or more of the above classes of drugs – 14%.

Complex therapy also included additional drugs: amino acids, detoxification solutions, nootropic drugs, psychostimulants, glucose, insulin, magnesium sulfate, antiplatelet agents, antidepressants, tranquilizers, metabolic drugs, antispasmodics, and others.

The use of  $\beta$ -blockers among Ukrainian participants did not differ from Egyptian. The use of calcium channel blockers was higher among Egyptians than among Ukrainians. Diuretics were used more often by Ukrainians than by Egyptians. The use of ACEI/ARBs surpassed the use of all other classes of antihypertensives among both groups. Whereas the ACEI/ARBs use among Egyptians was lower than among Ukrainians.

Because hypertension is a chronic, often asymptomatic disease requiring lifelong therapy, compliance with this pathology is extremely important. In this analysis of adults with HTN, we determined compliance, defined as adhering to the regimen of care recommended by the clinician and persisting with it over time. To interview representatives, a questionnaire was created.

The analysis of the received answers from 36 patients of the therapeutic department Ternopil clinical hospital 3 during two months revealed a high level of compliance in 9 (25%) of the interviewed patients with hypertension. The medium level was observed in 18 (50%) patients. 25% (9) of patients had low adherence to treatment. Thus, 75% (low and medium) of patients with hypertension do not always perform the doctor's prescription, which caused increases in the chance of complications of hypertension and the prognosis becomes worse.

Among the 27 people with adherence deficient to treatment, the reason for the unfull implementation of medical prescriptions with the same frequency was called deficient of funds and forgetfulness (13 and 14 people each). That is, only 50% had an objective reason for insufficient compliance, and the rest of the patients required additional attention from healthcare workers to explain the necessity for the straightforward

implementation of the recommendations for the treatment of hypertension.

With understanding to complete the prescription are ready 29 (80.6%) respondents; however, 5 (13.9%) of the patients stated that they were not always ready to fulfill the prescription, and 2 (5.5%) did not think it is necessary to perform them. Although all 100% of those respondents wanted the most modern treatment for hypertension, they asked for cheaper medications in almost half of the cases.

At this point analysis of adults with HTN, we noted no significant difference in the adherence to antihypertensive therapy between Ukrainian and Egyptian participants. A number of 46 (76.7%) Egyptian respondents were ready to fully comply with the doctor's prescription, 10 (16.7%) were only sometimes ready to follow treatment recommendations and 4 (6.6%) of the patients refused to perform them.

One of the main principles of the treatment of hypertension is the constant taking of medication and diet, so patients were asked about the relationship between long-term medication and diet. It was found that 17 (47.2%) Ukrainian persons were ready to fulfill these requirements, 10 (27.8%) doubted and 9 (25%) refused the stated requirements. The ratio of Egyptian patients to the required long-term use of drugs and diet was 18 (30%), 26 (43.3%), and 16 (26.7%), respectively. This result, once again, announces the necessity for pharmaceutical care and preventive measures for hypertension patients.

## Discussion

Hypertension is one of the foremost preventable causes of premature morbidity and mortality worldwide, a serious risk factor for stroke (ischaemic and hemorrhagic), myocardial infarction, coronary failure, chronic renal disorder, peripheral vascular disease, cognitive decline, and premature death. Untreated hypertension is a dynamic rise in blood weight, regularly coming full circle during a treatment-resistant state thanks to related vascular and renal harm.

The most important aspect of the pharmacological treatment of hypertension is the achievement and maintenance of optimal BP levels. Today, there is a possibility of reducing blood pressure to optimal rates in most patients with hypertension, which requires long-term and regular administration of drugs.

Guidelines for hypertension management [5–7] recommend the use of diuretics as initial monothera-

py, particularly in elderly patients;  $\beta$ -blockers are recommended in the presence of coronary artery disease, calcium channel blockers are recommended in elderly patients, in the presence of angina, while angiotensin-converting enzymes inhibitors and angiotensin receptor blockers are recommended in diabetic patients and presence of proteinuria.

Current ECS guidelines suggest no evidence that the BP response to treatment in ethnic groups differs significantly from that reported in the general population in Europe [7]. Hypertensive black patients show a reduced antihypertensive response to RAS-blocker monotherapy. In contrast, they usually respond more effectively to thiazide or thiazide-like diuretics and CCBs, which in black patients may be combined with each other or with a RAS blocker, making the latter more effective [7, 8]. Egyptians seem to belong to the salt-sensitive group. Thus limiting daily salt intake should be encouraged and be part of a nationwide hypertension prevention program [6, 7, 9–11].

There is growing evidence that poor adherence to treatment—in addition to physician inertia—is the only important explanation for poor BP control. Non-adherence to antihypertensive therapy correlates with a better risk of CV events [12, 13]. It is generally accepted that in therapy with a high level of compliance, patients receive the drug at the specified time in more than 80% of cases. In therapy with medium compliance, patients take medication strictly at the specified time in 30–80% of cases. At low compliance, patients take the drug at the specified time in less than 30% of cases [14].

Studies have found, on the one hand, a high level of regular antihypertensive therapy with an understanding to complete the prescription was detected, on the other hand, a significant frequency of changes or refusal of therapy, in general, was established.

If necessary, long-term use of drugs is important to achieve high adherence with special educational and motivational techniques with the participation of doctors, nurses and pharmacists. Patients with low adherence to AHT do not attach much importance to their HTN, do not fully understand the threats of this disease and, when in well-being, refuse to take the drugs. Moreover, the most common causes of low adherence to treatment are taking medications as needed, forgetfulness, fear of side effects, and fear of addiction [12, 15, 16]. Data from other researchers also indicate a significant influence of factors associated with the denial of the need for regular therapy: patients do not believe that the drug should be taken all the time, do not want to take the drug(s), do not want to be dependent [17]. It is



recommended to minimize the frequency of changes in the treatment regimen since frequent changes in the treatment regimen are associated with low adherence and low treatment effectiveness [7, 18, 19].

Hypertension is a clear and significant independent risk factor for cardiovascular events and mortality worldwide, and the medical treatment of hypertension mitigates this risk. In real life, a noticeable proportion of hypertensive individuals appear to be unaware of the risk or, if aware, do not undergo therapy. Furthermore, target BP levels are often not achieved in treated hypertensive patients. Today we are talking about a “low pandemic adherence to treatment” [20], and this factor can offset all efforts of doctors prescribing rational therapy. Improving adherence could have significant public health implications and improve outcomes specific to hypertension and cost and healthcare utilization. When working with a patient, we must consider some uncontrollable factors that we cannot change. In particular, greater comorbidity and concurrent medication use were also associated with poorer adherence; we must also pay attention to this.

## Conclusions

The study shows that the majority of the participants (85% of Egyptian; 68% of Ukrainian) do not know the meaning of HTN, 46.7% and 50.2%, respectively, do not know the normal BP level, while 69.7% of Egyptians; 81.3% of Ukrainians know symptoms of high BP.

In this study, the majority of participants are aware of complications of HTN as stroke, heart failure, heart attack, and renal failure, with rates of: 88.3%, 90%, 90%, 68.3% and 90.3%, 89%, 90%, 72.3% of Egyptian and Ukrainian participants respectively also 83.3% and 85.6% of them know that HTN can be prevented by changing lifestyle.

Regarding the pharmacotherapy of HTN, the use of  $\beta$ -blockers among Ukrainian participants did not differ from Egyptian (25% each). 32% of Egyptians and 48.4% of Ukrainian patients were treated with diuretics, respectively. The use of calcium channel blockers was a little bit higher among Egyptians (33%) than Ukrainians (26.7%). The use of ACEI/ARBs surpassed the use of all other classes of antihypertensives among both groups. Whereas the ACEI/ARBs use among Egyptians was lower (53%) than among Ukrainians (75.1%).

When performing compliance studies, 75% (low and medium level of adherence) of patients with hypertension do not always perform the doctor's pre-

scription, which causes increases in the chance of complications of HTN and the prognosis worsens. At this point of the analysis, we noted no significant difference in the adherence to antihypertensive therapy between Ukrainian and Egyptian participants. With understanding to complete the prescription are ready 80.6% of Ukrainian and 76.7% of Egyptian respondents; however, 13.9% of the Ukrainian patients, 16.7% of Egyptians stated that they were not always ready to fulfill the prescription and 5.5% of Ukrainians, 6.6% of Egyptian participants did not think it is necessary to perform them. However, all 100% of respondents wanted the most modern treatment for hypertension. Improving adherence could have significant public health implications and improve hypertension outcomes.

## Conflict of interest

The authors declare no conflict of interest.

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