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PHARMACEUTICAL CARE APPROACH AND HYPERTENSION

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ABSTRACT

Hypertension is a state of the organism that level of arterial blood pressure (BP), is associated with doubling of long-term cardiovascular (CV) risk. Hypertension is one of the most common chronic diseases. Uncontrolled hypertension may lead to a lot of complications. That is why practicing pharmaceutical care for the hypertensive patients by the community pharmacists is from a great importance. That is why the aim of the study is to make a review of the effect of pharmaceutical care on the patients with hypertension.

KEYWORDS: Hypertension, pharmaceutical care, complications, education.

INTRODUCTION

According to the World Health Organization's (WHO) Clinical guidelines for the management of hypertension, hypertension is "that level of arterial blood pressure (BP), associated with doubling of long-term cardiovascular (CV) risk".[1]

The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7) provides another definition ("traditional" definition) – "hypertension is persistent BP in the medical office ≥ 140/90 mmHg".[2]

The "wider" definition of hypertension states that "hypertension is person's absolute risk of CV events, rather than a strict focus on BP measurements".[2]

According to the WHO Clinical guidelines for the management of hypertension, the diagnosis of hypertension in adults is stated "when the average of two or more diastolic blood pressure measurements on at least two subsequent visits is ≥90 mmHg, or when the average of multiple systolic blood pressure measurements on two or more subsequent visits is ≥140 mmHg". Patients should be well informed that a single elevated measurement does not constitute a diagnosis of hypertension, but is a sign for further hypertension and the subject should be under doctor's observation.[1]

Classification

Table 1: Systolic and diastolic blood pressure thresholds in clinical medicine[3]

Conventional blood pressure measurements in mmHg		
Category	**Systolic BP**	**Diastolic BP**
Normotension		
Optimum	<120	<80
Normal	120-129	80-84
High-normal	130-139	85-89
Hypertension		
Stage I (mild)	140-159	90-99
Stage II(moderate)	160-179	100-109
Stage III (severe)	>180	>110
Isolated systolic hypertension	>140	<90

In correspondence with the Table 1 normal blood pressure is defined as levels <120/80 mmHg. Systolic blood pressure (SBP) of 120-139 mmHg or diastolic blood pressure (DBP) of 80–89 mmHg is classified as pre-hypertension. With the increasing of BP from normal to pre-hypertension, the risk for CV events rises.

Hypertension is divided into three stages:
- Stage I includes patients with systolic blood pressure 140 - 159 mmHg or diastolic blood pressure 90 - 99 mmHg.
- Stage II includes patients with systolic blood pressure 160 - 179 mmHg or diastolic blood pressure 100 -109 mmHg.
- Stage III includes patients with systolic blood pressure ≥180 mmHg or diastolic blood pressure ≥110 mmHg.

When the systolic BP is >140 and the diastolic BP is <90, the condition is called isolated systolic hypertension.

Another classification divides hypertension into essential (primary) hypertension and non-essential (secondary) hypertension. The cause of essential hypertension is unknown. It may appear as a result of the action of different types of risk factors. As to the secondary hypertension, the high BP is a result of a specific and potentially treatable disease.[4]

Further hypertension may be classified into benign hypertension, in which there is gradual organ damage, and malignant hypertension, in which there is a severe and often acute renal, retinal and cerebral damage.[5]

Pharmaceutical care for hypertensive patients
The aims of the pharmaceutical care are curing a disease, eliminating or reducing symptoms, slowing a disease process, and preventing a disease or symptoms. To achieve these ends, pharmacists cooperate with patients and with other health care professionals in designing, implementing, and monitoring a care plan aimed at preventing and resolving drug-related problems (DRPs).[27]

Hypertension is one of the most common chronic diseases. Uncontrolled hypertension may lead to a lot of complications. That is why practicing pharmaceutical care for the hypertensive patients by the community pharmacists is from a great importance. Pharmaceutical care for hypertensive patients includes several steps:

- Blood pressure measurement.
- Examination and evaluation of the drug treatment.
- Identification of DRPs.
- Non-pharmacological treatment.
- Educational programme for patients.
- Formulating and implementing a plan.
- Monitoring and modifying the plan, assuring positive outcomes.

Blood pressure measurement – guidelines
There are many different kinds of blood pressure monitoring devices, but it is easiest to use a device that is fully automatic. There are six commonly available BP cuffs (Table 1). It is important to be adjusted the proper cuff for the patient in order to be granted exact measurement.

Table 1 – Sizes and names of commonly used blood pressure cuffs.[6]

Cuff name	Arm circumference (cm)	Width (cm)	Length (cm)
Newborn	≤ 15	2.5 – 4.0	5.0 – 9.0
Infant	16 - 21	4.0 – 6.0	11.5 – 18.0
Child	22 - 26	7.5 – 9.0	17.0 – 21.0
Normal adult	27 - 34	11.5 – 16.0	22.0 – 30.0
Large adult	35 - 44	14.0 – 16.0	30.5 – 36.0
Thigh	45 - 52	18.0 – 19.0	36.0 – 42.0

Healthcare professionals taking blood pressure measurements need adequate initial training. Healthcare providers must ensure that devices for measuring blood pressure are properly validated, maintained and regularly recalibrated according to manufacturers' instructions. When measuring blood pressure in the clinic or at home, it is important to be standardised the environment and to be provided a relaxed, temperate setting, with the person quiet and seated, and their arm outstretched and supported.[7]

There a few steps that has to be followed:

Step 1: The patient should be seated for at least 5 minutes, relaxed and not moving or speaking.

Step 2: The arm must be supported at the level of the heart. The pharmacist has to ensure that no tight clothing constricts the arm.

Step 3: The cuff has to be placed on neatly with the centre of the bladder over the brachial artery. The bladder should encircle at least 80% of the arm (but not more than 100%).

Step 4: Before estimating the systolic BP the pharmacist should palpate the brachial artery and inflate cuff until pulsation disappears. After that he has to deflate the cuff.

Step 5: Estimation of systolic pressure.[8]

Examination and evaluation of the drug treatment

Examination and evaluation of the drug treatment includes the following steps:

Step 1: In order to help patients, the pharmacist must first establish a relationship with the patient and develop trust. The pharmacist should demonstrate concern and care for the patient in order for him to know that the information the pharmacist is providing and the questions the pharmacist is asking are in the patient's interest.[30] In some situations (e.g. pediatrics, geriatrics, critical care, and language barriers) the opportunity to develop a professional relationship with and collect information directly from the patient may not exist. Under these circumstances, the pharmacist should work directly with the patient's parent, guardian, and/or principal caregiver.[33]

Step 2: Previous use The pharmacist must determine whether the patient has taken the drugs on the reception before.[31] The interview is used to systematically collect patient-specific subjective information and to initiate a pharmacy record which includes information and data regarding the patient's general health and activity status, past medical history, medication history, social history (including economic situation), family history, and history of present illness. The record should also include information regarding the patient's thoughts or feelings and perceptions of his/her condition or disease. The pharmacist uses health/physical assessment techniques (blood-pressure monitoring, etc.) appropriately and as necessary to acquire necessary patient-specific objective information.[33]

Step 3: Aim of the treatment The pharmacist must identify the symptoms or disease, which have to be treated and their understanding of the patient, and the perception of that treatment. The pharmacist should ask the patient what his doctor has told him about the purpose of the treatment. This will allow the pharmacist to accurately assess the level of understanding of the patient of his disease and the goal of the treatment, and will allow the patient to assess problems associated with their disease. Then, the pharmacist would be able to evaluate the needs of the patient for information, and to determine the possible misunderstanding or lack of motivation that can lead to non-compliance. [31]

Step 4: Drug regimen The pharmacist must then ascertain whether the patient knows how to use the drugs. First, the pharmacist should ask the patient what his doctor has told him about drug use and whether the patient expects any problems associated with taking prescription medication. This will help the pharmacist to assess the information needs of the patient and will save time if the patient demonstrates that he has clearly understood all the information. This will allow the patient to evaluate the perceived problems with the drug regimen and allow the pharmacist to identify possible non-compliance or dispensing problems.[31]

Identification of DRPs

A drug related problem is "an event or circumstance involving drug therapy that actually or potentially interferes with desired health outcomes" (Pharmaceutical Care Network Europe (PCNE) 1999).[28] According to the National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP), USA medication error is "any preventable event that may cause or lead to inappropriate medication use or patient harm while medicationis in the control of a healthcare professional, patient, or consumer".[28]

A patient is experiencing (or has potential to experience) an undesirable event (medical problem, complaint, symptoms, diagnosis or syndrome) that is of physiological, psychological, social, emotional or economic origin and is a function of the patient's:

- Needing pharmacotherapy but not receiving it (a drug indication)

- Taking or receiving the wrong drug.

- Taking or receiving too little of the correct drug.

- Taking or receiving too much of the correct drug.

- Experiencing an adverse drug reaction.

- Experiencing a drug-drug, drug-food, or drug-laboratory interaction.

- Not taking or receiving the drug prescribed.

- Taking or receiving a drug for which there is no valid medical indication.[29]

Although drug-drug interactions constitute only a small proportion of adverse drug reactions, they are important because they are often predictable and therefore avoidable or manageable. Their frequency is related to the age of the patient, the number of drugs prescribed and the number of physicians involved in the patient's care. The most important mechanisms for drug-drug interactions are the inhibition or induction of drug metabolism, and pharmacodynamic potentiation or antagonism. Interactions involving a loss of action of one of the drugs are at least as frequent as those involving an increased effect.[32]

Non-pharmacological treatment

A variety of lifestyle modifications have been shown, in clinical trials, to lower blood pressure.[9-10] These include weight loss in the overweight, physical activity, moderation of alcohol intake, increased fresh fruit and vegetables and reduced saturated fat in the diet, reduction of dietary sodium intake, and increased potassium intake.[11] All individuals should be strongly encouraged to reduce total fat and saturated fat intake. Total fat intake should be reduced to about 30% of calories, saturated fat intake should be limited to less than 10% of calories and trans-fatty acids eliminated. Most dietary fat should be polyunsaturated (up to 10% of calories) or monounsaturated (10–15% of calories). Trans-fatty acids come from both animal and vegetable sources and are produced by partial hydrogenation of unsaturated oils. Dietary intake of trans-fatty acids increases LDL-cholesterol and, at high intakes, lowers HDL cholesterol.[11] A low intake of fats and oils (less than one-fifth of total calories) increases the risk of inadequate intakes of vitamin E and essential fatty acids, and may contribute to unfavourable changes in HDL-cholesterol and triglycerides.[16] It has also been

demonstrated that replacing saturated and trans-unsaturated fats with monounsaturated and polyunsaturated fats is more effective in preventing coronary heart disease events than reducing overall fat intake.[11]

All individuals should be strongly encouraged to reduce daily salt intake by at least one-third and, if possible, to <5 g NaCl or 90 mmol per day.[11] Reducing dietary sodium intake to no more than 100 mmol (2.4 g sodium or 6 g sodium chloride) reduces the blood pressure by an average of 4–6 mmHg.[1] Patients should be advised to avoid added salt, to avoid obviously salted food (particularly processed foods) and to eat more meals cooked directly from natural ingredients containing more potassium.[1] In societies with a high potassium intake, both the mean blood pressure and the prevalence of hypertension tend to be lower than in societies with a low potassium intake.[12] An increase in potassium intake may also contribute to preventing strokes and coronary artery disease in hypertensive patients rather than normotensive subjects.[13-14]

The patients should consume a range fruits and vegetables - at least 400 g a day, as well as whole grains and pulses.[15] Fruits and vegetables may promote cardiovascular health through a variety of micronutrients, antioxidants, phytochemicals, flavonoids, fibre and potassium.[11]

Increasing weight has been shown in several studies to be strongly associated with the development of hypertension, so the effect of weight loss on blood pressure control has been a focus of a lot of studies.[16] Obesity is strongly related to major cardiovascular risk factors, such as raised blood pressure, glucose intolerance, type 2 diabetes, and dyslipidaemia.[11]

Meta-analyses from clinical researches have shown that a weight-reducing diet, combined with exercise, produces significant weight loss, reduces total cholesterol and LDL-cholesterol, increases HDL-cholesterol, and improves control of blood pressure.[18-19] A meta-analysis of randomized controlled trials found that a net weight reduction of 5.1 kg, resulting from restricted energy intake, increased physical activity or both, reduced systolic blood pressure by 4.44 mmHg and diastolic blood pressure by 3.57 mmHg.[19]

Physical activity improves endothelian function, which enhances vasodilatation and vasomotor function in the blood vessels.[20] In addition, physical activity contributes to weight loss, glycaemic control, improved blood pressure, lipid profile and insulin sensitivity.[11]

People who drink alcohol heavily have a high mortality from all causes and cardiovascular disease, including sudden death and haemorrhagic stroke. In addition, they may suffer from psychological, social and other medical problems related to high alcohol consumption.[22] A meta-analysis of 28 cohort studies of alcohol consumption and CHD showed that risk decreased as consumption increased from 0 to 20 g/day. There was evidence of a protective effect of alcohol up to 72 g/day, and increased risk at consumptions above 89 g/day. The amount of alcohol associated with the lowest mortality rates was between 10 and 30 g (1–3 units) per day for men and half these quantities for women (1 unit is equivalent to 150 ml of wine, 250 ml of beer or 30–50 ml of spirits).[23]

There is an evidence from prospective cohort studies regarding the beneficial effect of smoking cessation on coronary heart disease mortality.[21] The risk associated with smoking is primarily related to the amount of tobacco smoked daily and shows a clear dose – response relationship.[24] Duration also plays a role, and, while cigarette smoking is the most common, all types of smoked tobacco are harmful.[25]

Educational program for patients

Since hypertension is a silent condition, many patients will not feel any difference after taking the medications, and some may think they are perfectly fine and tend to become noncompliant. Educating the patient about the nature of hypertension and the importance of compliance in managing it are crucial to avoid this problem. Many antihypertensive medications may cause hypotension, which is characterized by dizziness, lightheadedness, or fainting especially when getting up from a lying or sitting position (orthostatic hypotension). The patients must be instructed to get up slowly, and to limit their alcohol intake as it may increase the hypotension symptoms.[34] In working with individual patients, patient groups, families, and caregivers, pharmacists should approach education and consulting as interrelated activities. Pharmacists should educate and consult all patients beyond the minimum requirements of laws and regulations. In pharmaceutical care, pharmacists should encourage patients to seek education and consulting and should eliminate barriers to providing it.[35]

Formulating and implementing a plan

The pharmacist, in accordance with other healthcare providers, identifies, evaluates and then chooses the most appropriate actions to improve and assure the safety, effectiveness, and cost-effectiveness of current or planned drug therapy and minimize current or potential future

health problems. The pharmacist formulates plans to effect the desired outcome. The plans may include work with the patient as well as with other health providers to develop a patient-specific drug therapy protocol or to modify prescribed drug therapy, develop and implement drug therapy monitoring mechanisms, recommend nutritional or dietary modifications, add non-prescription medications or non-drug treatments. The pharmacist reviews the plan and desirable outcomes with the patient and with the patient's other healthcare providers if possible. The pharmacist documents the plan and desirable outcomes in the patient's medical and pharmacy record. The pharmacist and the patient take some steps necessary to implement the plan. The pharmacist works with the patient to maximize patient understanding and involvement in the therapy plan, assures that arrangements for drug therapy monitoring (e.g. laboratory evaluation, blood pressure monitoring, etc.) are understood by the patient, and that the patient receives and knows how to properly use all necessary medications and related equipment.[33]

Monitoring and modifying the plan, assuring positive outcomes

The pharmacist regularly reviews monitoring parameters in order to determine if satisfactory progress is being made toward achieving desired outcomes as outlined in the drug therapy plan. The pharmacist and patient determine if the original plan should continue to be followed or if modifications are needed. The pharmacist updates the patient's medical and pharmacy record with information concerning patient progress, noting the information which has been considered, his/her assessment of the patient's current progress, the patient's assessment of his/her current progress, and any modifications that are being made to the plan. Communications with other healthcare providers should also be noted.[33]

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