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HYPERTENSION – A PUBLIC HEALTH PROBLEM

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Abstract

Aim. The aim of this paper is to present public health importance of hypertension in population as one of the major CVD risk factor as well as a model of integrated approach to hypertension control at community level. **Background.** In spite of wide knowledge of pathophysiology and epidemiology in development of hypertension, ability to easily diagnose it, availability of efficient medications, hypertension continues to have high prevalence and setting up hypertension controls poses significant public health challenge. High prevalence of hypertension exists in all countries of the world, regardless of socioeconomic status of the country. It is estimated that the number of people with hypertension by 2025 will rise by 15-20%, and the number of sick people will increase up to 1.5 billion people worldwide. **Methods.** A review of the relevant literature which discusses the importance of defining clear strategies and interventions in the control of hypertension in countries, with particular emphasis on integrated hypertension management that has the greatest impact. **Discussion.** Effective and efficient hypertension control requires two approaches: population approach and individual approach to high-risk individuals. The balanced combination of population approach and an approach to access high-risk individuals is vital for the effective control of hypertension and cardiovascular diseases. **Conclusions.** Health systems in every country must be flexible and ready to provide adequate model of integrated approach to hypertension control at community level understanding their own local needs.

Key words: hypertension, cardiovascular diseases, control of hypertension

Introduction

In the last few decades there has been a significant increase of noncommunicable diseases (NCD) in the world, such as cardiovascular diseases (CVD), carcinoma, chronical obstructive pulmonary diseases (COPD) and diabetes. Noncommunicable diseases have become one of the main global public health challenges (1, 2) as they are responsible for almost 90% of deaths and for 84% of disease burden in European Region. This burden is increasing disproportionately in countries with low and middle-low income (3, 4).

Common CV diseases risk factors are: tobacco use, inadequate diet, physical inactivity and alcohol abuse. Working actively on these risk factors could prevent onset of disease and premature death from CVD. In connection to this, in 2013, the World Health Assembly adopted the Global Action Plan for the Prevention and Control of Noncommunicable Diseases, providing guidance and policy options. If these options are implemented in the period 2013-2020, they will contribute to the 9 global targets set for noncommunicable diseases, which should be achieved by 2025 compared to the base year 2010 (4).

Numerous population studies have also confirmed that high blood pressure (BP) and/or hypertension is an independent and significant CV and coronary heart disease risk factor. Hypertension has been identified by World Health Organization (WHO) as one of the most significant risk factors for morbidity and mortality worldwide and despite strong evidence for treatment, studies suggest that many people remain sub-optimally controlled (5, 6).

CVD, in general, have the biggest impact on years of healthy life lost, on quality of life lost, as well as on life expectancy differences between populations. Global statistics show that CVD are responsible for every third death, with coronary heart disease being the primary cause of death in the world. It is estimated that 17 million people die of CVD, of heart attacks and strokes especially. (3, 4)

Since NCDs, especially CVDs, are the leading cause of disease and dying in the world, defining the integrated management of CVD, including risk management, is a major challenge for health systems in the countries (7, 8). Good practice in countries states that significant advances in health can be achieved through a well-organized and focused approach to prevention, treatment and disease control, which should be an integral part of the health system. This is possible in health systems that support community intervention programs. To achieve this, major health policy changes, health care organizations, staff training and equipment need to be introduced. Finally, such approaches do

not require significant resources compared to high-sophisticated clinical interventions (1, 2, 4, 7).

The aim of this paper is to present public health importance of hypertension in population as one of the major CVD risk factor as well as a model of integrated approach to hypertension control at community level.

An Integrated Approach to Hypertension Control

In recent decades, significant progress has been made in understanding epidemiology, pathophysiology and risk associated with hypertension as well as in obtaining evidence demonstrating that BP reduction can greatly reduce premature morbidity and mortality (9-12).

For the first time, in 2003, as the number of population and clinical studies in Europe increased and their results provided new evidence, the European Association for Hypertension and the European Association for Cardiology developed their own guidelines for management of hypertension. These guidelines were made in response to the WHO/ISH suggestion to regional experts to prepare recommendations for disease management based on regional conditions (13). Since 2003, regular management reviews have been conducted for hypertension management and the latest issue is from 2018 (14). According to the adopted definitions, hypertension is a condition when the systolic blood pressure (SBP) value is at least 140 mmHg and/or the diastolic blood pressure (DBP) value is at least 90 mmHg (Table 1).

The overall prevalence of hypertension among the adult population is between 30-45% (14). High prevalence of hypertension exists in all countries of the world, regardless of socioeconomic status of the country. Therefore, hypertension becomes a progressive disease or a risk factor for the emergence of CVD. Since there is a rise of other risk factors that lead to hypertension, such as unhealthy eating habits, physical inactivity and obesity, the prevalence of hypertension will increase. It is estimated that the number of people with hypertension by 2025 will rise by 15-20%, and the number of sick people will increase up to 1.5 billion people worldwide.

Table 1. Definitions and Classification of Blood Pressure Levels (mmHg)

Category*	Systolic blood pressure	Diastolic blood pressure
Optimal BP	<120	<80
Normal BP	120-129	80-84
High normal BP	130-139	85-89

Category*	Systolic blood pressure	Diastolic blood pressure
Grade 1 hypertension – mild	140-159	90-99
Grade 2 hypertension - moderate	160-179	100-109
Grade 3 hypertension - severe	≥180	≥110
Isolated systolic hypertension	≥140	<90

If the SBP and DBP values correspond to different categories, a higher BP category will be used. Isolated systolic hypertension may also be graded (step 1, 2, 3) according to the already indicated values of SBP, in the case of DBP being less than 90mmHg.

Source: 2018 European Society of Hypertension-European Society of Cardiology guidelines for the management of arterial hypertension – Guidelines Committee

The health systems of countries worldwide are still facing inadequate hypertension management. It is necessary to improve management by healthcare workers continually in order to have at least two-thirds of hypertensive patients who would achieve adequate BP control (15-17). All of this opens up the possibility of setting up socio-medical approaches to hypertension control, which basically prevent a continuous, expensive cycle of clinical management of hypertension and its complications (18, 19).

Effective and efficient BP control in population requires two approaches: population approach and individual approach to high-risk individuals. Both approaches are necessary and complementary for effective control and management of elevated BP and hypertension in the community. Particularly, it should be emphasized that a balanced combination of population prevention strategies and a preventive approach to access high-risk individuals as an integrated approach is vital for effective epidemic control and the control of the NCD burden growth in the community in general, particularly hypertension and CVD (4, 8).

Situational Analysis in the Federation of Bosnia and Herzegovina and Canton Sarajevo

CVDs have been the leading cause of death in the Federation of Bosnia and Herzegovina (FB&H) for several decades, with a share of 17.6% in the 2018 morbidity pattern. The most common in this group are hypertensive diseases with an incidence rate of 1639.6/10,000, which is a significant increase over the previous years, in 2016, the incidence rate was 1219.1/10,000 (20). The morbidity rate of hypertension diseases in Canton Sarajevo in 2018 was 1186.9/10,000 population, which is less than the average in the FB&H (1639.6/10,000 population) (20, 21).

The source of consistent data of these diseases is health survey. In the FB&H, in the past 17 years, two representative population surveys have been conducted on assessing the health status of adults – in 2002 and 2012. The results of the survey conducted in 2012 showed that 42% of adults had hypertension (systolic pressure> 140, diastolic> 90mmHg) and/or were taking anti-hypertensive therapy. Compared to that there was no statistically significant difference to the overall prevalence of hypertension in 2002 (40.9%). However, there was a statistically significant difference in the prevalence of hypertension in men, which increased by 8% in 2012 (from 36% to 44%). Over the 10-year period, there was a fall in the prevalence of hypertension in women, also by 8 % (from 45% to 38%) (22-25).

Literature Overview

The CVD problem in the world, in general, was highly ranked in the 70s of the last century. At that time, many health intervention programs were planned at the community level in order to promote health and lifestyle changes.

The first implemented program based on these ideas was the North Karelia Project implemented in Finland in 1972. Significant results were achieved in this project, primarily through hypertension control programs. It started as a pilot project and after significant net reductions, both in risk factors and mortality rates of CVD, state-level activities began. In the 25-year period during these activities in Finland, smoking prevalence among men was significantly reduced. There was also a significant reduction in serum cholesterol and blood pressure levels. In the same period, the mortality rate of CVD for male aged 35-64 was reduced by 68%, coronary heart disease by 73%, cancer by 44%, and for all causes overall mortality was reduced by 49% (26-28).

Since then many projects have been implemented as demonstration projects of WHO programs: CINDI (WHO / EURO), CARMEN (WHO / AMRO), INTERHEALTH (WHO / HQ). The main role of the projects set up in the community is to demonstrate and stimulate the state policy for the prevention of noncommunicable diseases (29).

In developed countries, the main problem in managing hypertension has shifted from screening to effective management, but there is still a relatively low rate of hypertension control in the population. This further promotes population approaches, as well as the implementation of hypertension treatment guides, especially at the PHC level (30, 31).

Model of Integrated Hypertension Management at the Community Level

At the current moment it is necessary to set up an integrated hypertension management model in the FB&H due to the relatively high prevalence of hypertension and major CV risk factors (25).

Population preventive strategies are the most cost-effective (4). These strategies aim to change health behaviour in terms of reducing exposure to risk factors and reducing risk across the population. Big potential is gained, but there are great challenges too.

Preventive measures bring great benefits to the community, yet they seem to bring little benefit to the individual, which can cause negative motivation in the population. This is described as a "preventive paradox." It is therefore necessary to accept the approaches accordingly. The key challenge is to find the right balance between the population approach and the high-risk individual approach (32).

In the community management (population management) approach, active involvement of a large number of actors at all three levels of management (strategic, tactical and operational) in the health sector is essential. (Table 2) (33, 34).

The health sector as a basic public sector is the first place to start the initiative.

Table 2. Cost-Effective Interventions in Reduction of Hypertension Prevalence

Management Levels	Possible Interventions	Actors	Theoretical population coverage
Strategic Management	1. Legislation on salt reduction in industrialized food produced in the domestic industry and the proper labelling of the food contents (for example)	Government of the Country	100%
Tactical Management	1. Health education through mass/social media 2. Campaigns 3. Establishing risk screening 4. Development of diagnostic-therapeutic protocols 5. Education of professionals 6. Development of referral programs e.g. "School for Hypertension at Community Level"	Public Health Institutes Chambers Professional associations Non-governmental organizations	60-80%

Management Levels	Possible Interventions	Actors	Theoretical population coverage
Operational Management	1. Pharmacological treatment and education on healthy lifestyles including dietary advice for persons with SBP over 160mmHg or 140mmHg 2. Pharmacological treatment and education on healthy lifestyles including dietary advice for people with serum cholesterol concentrations over 5.7mmol/l 3. Nicotine replacement therapy with medical advice by a doctor 4. Development of hypertension counselling centres	Primary health care Hospitals	25-45%

The role of strategic management level in the health sector (Government of the country) is significant in reducing the risk. The adoption of legal provisions is one of the possible instruments. This is more cost-effective because of the assumption that laws will lead to changes in agreements rather than just professional recommendations.

Both approaches require consultations with a large number of active actors and a multi-sectoral approach

Unfortunately, countries in transition have a weak regulatory structure and have the greatest dependence on a market that is out of control. In those cases, it is necessary to choose sustainable and implementable activities. Such activities include the implementation of increased cigarette taxes, legal regulations on reducing salt content in industrialized food with appropriate labelling of the contents, supporting healthy food production, or food price subsidies for domestic producers. These approaches should be developed in small countries, with limited financial resources, such as Bosnia and Herzegovina.

The role of tactical management level in health sector, such as Public Health Institutes, Health Professionals' Chambers, Professional Associations of Health Professionals, is in designing, setting up and implementing community intervention programs, through the preparation of promotional-preventive educational messages that are culturally sensitive, providing support for healthy lifestyle changes, establishing risk screening, developing diagnostic-therapeutic protocols, educating professionals, and developing referral programs. Raising the knowledge of social marketing is necessity at this level.

The role of operational healthcare management in the health sector is in active implementation of recommendations, production and distribution of

written materials and active participation in health education. This doesn't just include different levels of healthcare, such as Primary Health Care, secondary and tertiary health care (hospitals, clinics), but also the non-governmental sector. Also, role of local community is important.

Adopting a healthy lifestyle for all individuals is a critical point in the prevention of high BP and an essential part of hypertension management. The sociological framework of lifestyle modification implies setting up behaviour modification models that suggest increasing motivation of patients. Patients' attitudes are largely under the influence of cultural differences, beliefs and previous experiences with health care systems. These attitudes will be understood if health teams build and improve communication with patient and family.

The tables 3 and 4 show the Model of Integrated Hypertension Management - populational and individual approach, as proposed activities in the management process of community intervention programs (33, 34).

Table 3. Proposal of activities in the management process of community intervention programs - populational approach

GOAL – WHAT?	PROCESS-HOW?	PLACE- WHERE?	TIME- WHEN?
1. Reduction of hypertension prevalence by 10% among the adult population	- Legislation on salt reduction in the industrial production of food in the domestic industry and the proper labelling of the food contents	COMMUNITY Coverage 100% of the population	CONTINUOUSLY
2. Reduction of mean BP value in the population in order to promote and improve the cardiovascular health of the population	-Referral program development "School for Hypertension at Community Level"	COMMUNITY Coverage 100% of the population 1. Health workers - Family medicine teams (PHC) 2. Support groups - Healthy population 3. Population at risk 4. Representatives of mass media	MULTI-ANNUAL CONTROLLED PROGRAM IN CANTONS
3. Reduction of smoking, by 10%, especially among younger men	- Campaigns for possibility of using nicotine replacement therapy with medical advice by doctors - Health education through social media	Social Networks - Facebook, Twitter, WhatsApp Places the most frequently visited by this group - Coverage 55% of male population	MULTI-ANNUAL CONTROLLED PROGRAM IN CANTONS

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GOAL – WHAT?	PROCESS-HOW?	PLACE- WHERE?	TIME- WHEN?
4. Obesity reduction especially in middle-aged women population by 10%	- Health education through mass media, social networks - Education at workplaces - Promotion of preparation recipes for low-calorie meals	Social Networks - Facebook, Twitter, WhatsApp - Large shopping centres, non-governmental women's organizations Coverage 40% of female population	MULTI-ANNUAL CONTROLLED PROGRAM IN CANTONS

Table 4. Proposal of activities in the management process of community intervention programs - individual approach

GOAL – WHAT?	PROCESS-HOW?	PLACE- WHERE?	TIME- WHEN?
1. Reduction of undetected hypertension - increase of hypertension detection by 5%	- Blood pressure measurement at each visit to a health institution, when visiting a doctor for any reason. - After three re-measurements at certain time intervals, upon nurse's request, hypertension is diagnosed and a medical record is made with the risk factor measurements - medical history.	Health institutions Coverage 70% of the population	FIVE-YEAR PROGRAM
2. Establishing hypertension diagnosis and evaluating the patient	- Implementation 1. Diagnostic procedures 2. Repeated BP measurements 3. Holter BP 3. Medical history 4. Physical examinations 5. Laboratory and instrumental reviews. - Identification of other possible causes of hypertension - genetics, socio-economic environment - Assessment of presence or absence of organ damage, and cardiovascular diseases	Health institutions Coverage 100% of hypertensive patients	MULTI-ANNUAL CONTROLLED PROGRAM IN CANTONS
3. Estimation of CV risk factors in hypertensive patients	- Applying algorithms for evaluation of the CV - SCORE table	Health institutions Coverage 100% of hypertensive patients	MULTI-ANNUAL CONTROLLED PROGRAM IN CANTONS

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GOAL – WHAT?	PROCESS-HOW?	PLACE- WHERE?	TIME- WHEN?
4. Establishment of non-pharmacological hypertension treatment	- Lifestyle modification - Protocols on healthy lifestyle counselling - Health education and distribution of health promotion materials that contain culturally sensitive messages	Health institutions Coverage 15% of hypertensive patients (between the two hypertension thresholds)	MULTI-ANNUAL CONTROLLED PROGRAM IN CANTONS
5. Establishment of pharmacological hypertension treatment	- Pharmacological treatment protocols, - Support Plan in decisions, - Tracking and feedback information	Health institutions Coverage 40% of hypertensive patients (second degree hypertension) All team members must be involved in reaching the goal (nurses and pharmacists)	MULTI-ANNUAL CONTROLLED PROGRAM IN CANTONS

Discussion

Despite many efforts to diagnose and treat hypertension, this condition continues to be the leading cause of CV morbidity and mortality. It is therefore extremely important to improve the unsatisfactory treatment and hypertension control.

It is well known that, because of the asymptomatic nature, hypertension may remain undetected for a long time. Therefore, in addition to assessing the prevalence of hypertension in the population, it is necessary to evaluate the level of knowledge of hypertensive individuals about their own hypertension, the degree of treatment and control of hypertension, which is only possible through population survey. Early identification of the scale of the problem, early warning and early response enables timely avoidance of the future outbreaks and "explosion" of the risk factors (35, 36).

There are two preventive strategies for hypertension control described in the literature: population and individual strategies. Population strategy for reducing BP in all countries of the world is cost-effective and is especially recommended to countries with limited financial resources such as Bosnia and Herzegovina. Population strategy allows potential control of diseases incidence in the population. Population approach strongly supports the promotion and improvement of cardiovascular health of the population. Multiple interventions on the risk factors are possible by setting up healthy policies

in the country through multi-sectoral approaches in the community. In the population/community management approach, active involvement of a large number of actors at all three levels of management (strategic, tactical and operational) in the health sector is essential. The health sector as a basic public sector is the first place to start the initiative.

On the other hand, the individual approach to disease prevention does not allow to look at the cause of the disease in the environment and anticipate the course of the disease but requires continuous and significant screening of new high-risk individuals. When it comes to hypertension, the individual approach to risky individuals implies detection, treatment, and effective control of high BP. This approach requires effective treatment, both lifestyle modification and pharmacological treatment.

Since the FB&H is in the transition period of its socio-political development, the health systems must be flexible and ready to provide adequate and timely responses to demographic and social changes, changes in epidemiological patterns of diseases, expectations of health care users for quality and their participation in decision-making, inequalities in health among population groups, as well as on the advancement of science and technology (34, 37). Results from two population surveys conducted in the FB&H in 2002 and 2012 showed that there was no statistically significant difference to the overall prevalence of hypertension, which is still is quite high (40.9% vs. 42%) compared to some neighboring countries (Slovenia, Croatia, and Albania) (22).

Hypertension control in the FB&H is not yet well-organized considering absence of common strategic integrated approach. The current PHC reform, which is being done in family medicine teams and by continuous team training, opens up a lot of possibilities for studying approach to high-risk individuals. This primarily includes detection, early diagnosis, and initiation of hypertension treatment. Changing the attitudes of healthcare workers regarding integrated hypertension management is possible at the actual education organization of health workers.

In the light of previous recommendations, activities should be aimed directly towards a clear identification of health needs. Carefully planned, well-designed and implemented diseases control programs, either as a population or as an individual program, are the only powerful tools to address morbidity problems, using preventive measures (22, 38).

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HIPERTENZIJA – PROBLEM JAVNOG ZDRAVSTVA

Sažetak

Cilj. Cilj ovog rada je predstaviti važnost hipertenzije među stanovništvom za javno zdravstvo, kao jedan od glavnih faktora rizika od KVB, kao i model integrisanog pristupa kontroli hipertenzije na nivou zajednice. **Pozadina**. Uprkos raširenoj svijesti o patofiziologiji i epidemiologiji u razvoju hipertenzije, sposobnosti lakog dijagnosticiranja i dostupnosti efikasnih lijekova, hipertenzija i dalje ima veliku prevalenciju, a uspostavljanje kontrole hipertenzije predstavlja značajan izazov za javno zdravstvo. Visoka prevalencija hipertenzije prisutna je u svim zemljama svijeta, bez obzira na socioekonomski status zemlje. Procjenjuje se da će broj oboljelih od hipertenzije do 2025. godine porasti za 15–20%, a broj oboljelih povećat će se do 1,5 milijarde ljudi u cijelom svijetu. **Metode**. Pregled relevantne literature koja govori o važnosti definiranja jasnih strategija i intervencija u kontroli hipertenzije, s posebnim naglaskom na integrisano upravljanje hipertenzijom koje ima najveći **učinak na ovaj problem**. **Diskusija**. Učinkovita i efikasna kontrola hipertenzije zahtijeva dva pristupa: populacijski pristup i individualni pristup pojedincima visokog rizika. Uravnotežena kombinacija populacijskog pristupa i individualnog pristupa visokorizičnim pojedincima od vitalnog je značaja za efikasnu kontrolu hipertenzije i kardiovaskularnih bolesti. **Zaključci**. Zdravstveni sistemi u svim zemljama moraju biti fleksibilni i spremni pružiti adekvatan model integrisanog pristupa kontroli hipertenzije na nivou zajednice, uzimajući u obzir svoje lokalne potrebe.

Ključne riječi: hipertenzija, kardiovaskularne bolesti, kontrola hipertenzije

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