Family doctors approach in management of complications of hypertension in primary care.

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Abstract:

In this review we aimed to discuss evidence-based approach to the management of hypertension, the primary prevention of hypertension through the adoption and maintenance of healthy lifestyles highlight risk factors as well acute and long-term complications of hypertension. We conducted a comprehensive review through the MEDLINE database by using of PubMed to identify articles discussing "complications of hypertension" and "treatment" in primary care by family doctors, published in English language up to November, 2017. In conclusion, hypertension is a major worldwide problem and one of the most prevalent chronic disease. Most of the subjects have mild to moderate hypertension and the initial methods for management involve lifestyle changes focusing on decrease of dietary salt, fat and alcohol and increase in potassium and vegetables and fruits. Weight management and decrease in obesity and truncal obesity, regular physical exercise, tobacco cessation and anxiety management are essential. Pharmacological therapy needs to be initiated after lifestyle interventions and option of medication depends upon age, the general cardiovascular risk and co-morbidities. Management must concentrate on comprehensive risk reduction for better prognosis.

Introduction:

Hypertension is one of the most essential preventable reasons for early mortality worldwide. The World Health Report 2001 suggested that hypertension is estimated to create 7.1 million fatalities each year i.e. concerning 13% of all fatalities and makes up 4.4% of the global disease problem. In the Americas the number of persons with hypertension is cautiously approximated to be 140 million [1].

Occurrence figures for hypertension in populations over 40 years range widely. In the WHO MONICA project, prevalence differed from 8% in Catalonia to greater than 40% in Finland. In the Caribbean the prevalence of hypertension is estimated to be 26% and as high as 55% in studies of populaces over 25 and over 40 years specifically [2]. Hypertension is also the cause of considerable death in this area and figures from the Caribbean Epidemiology Centre (CAREC) show that hypertensive illness was the 5th leading cause of death in 2000. It should be noted that the leading causes of death were cerebrovascular disease (consisting of stroke), heart failure and ischaemic heart disease, which are known complications of hypertensive disease. Hypertension is termed "the quiet killer" as hypertensives are usually asymptomatic.

The aspects which contribute to hypertension are similar to those of the other major chronic non-communicable diseases such as obesity and diabetes. These consist of unhealthy diet, high salt intake, inadequate exercise and too much use of alcohol. The occurrence of hypertension likewise generally increases with age [3].Primary avoidance of hypertension need to be the goal of the health system and requires activities that target the general population as well as people, particularly those at higher threat for hypertension. The commonness of many threat elements for hypertension and diabetes justifies an incorporated method to the prevention and control of both.

In this review we aimed to discuss evidence-based approach to the management of hypertension, the primary prevention of hypertension through the adoption and maintenance of healthy lifestyles highlight risk factors as well acute and long-term complications of hypertension.

Methodology:

We conducted a comprehensive review through the MEDLINE database by using of PubMed to identify articles discussing “complications of hypertension” and “treatment” in primary care by family doctors, published in English language up to November, 2017. Furthermore, references list of each included article were reviewed for more identical citation concerning our review.

Discussion:

- **Definition and classification**

Blood Pressure (BP) is recorded by systolic and diastolic values. The systolic blood pressure is the optimal pressure in the arteries during contraction (systole) of the ventricles of the heart. The diastolic blood pressure is the pressure throughout relaxation (diastole) [4].Observed BP analyses form a continuum and cut-off points can be selected at particular points along this continuum to define hypertension or high blood pressure (HBP). For several years, BP readings of systolic 160 mmHg and diastolic 95 mmHg had actually been the "cut-off" factors recommended by the WHO Expert Committee on Arterial Hypertension. In 1997, the Joint National Committee (JNC) on Prevention, Detection, Evaluation and Treatment of High Blood Pressure of the USA in its sixth record (JNC6) described 3 phases of hypertension connected with raising threat of cardiovascular

events and kidney disease. It used cut-off factors of 140 (systolic) and 90 (diastolic) mmHg to specify hypertension (Stage 1), 160-179 (systolic) and 100- 109 (diastolic) to specify Stage 2 and ≥ 180 (systolic) and ≥ 110 (diastolic) to specify Stage 3 [5].

Hypertension may be classified etiologically as primary or secondary.

Primary hypertension (formerly called essential hypertension) is found in the majority of patients (approximately 95%). No specific cause is identified [6].

Secondary hypertension: in a few cases, it may be due to identifiable causes such as:

• Drugs

• Renal disorders

• Endocrine disorders

• Coarctation of the aorta

• Neurological disorders

Table1. Risk factors for hypertension [7].

Known modifiable risk factors for hypertension are:	**Non-modifiable factors include:**
Obesity	Age
Excessive intakes of salt, fat (especially saturated fat), and calories	Race e.g. African ancestry
Inadequate physical activity	Family history of hypertension or diabetes
Uncontrolled hyperglycaemic states	
High alcohol consumption	
Tobacco use	
Low potassium intake	
Sleep apnoea	
Psychosocial stress is often implicated but difficult to measure	

- **Complications of hypertension**

If not properly dealt with, hypertension could result in damages of the target organs - heart, brain, kidneys, eyes and vascular system (See Table 2). Appropriate management of hypertension can therefore lead to a decrease in the danger for these diseases [8].

Table 1: Signs and Symptoms of End-organ Damage

Organ	Signs/Symptoms
Heart	Displaced and thrusting apex beat Left ventricular hypertrophy on ECG Angina or prior myocardial infarction Congestive heart failure
Brain	Transient ischemic attack Stroke
Kidney	Proteinuria Raised blood urea or creatinine
Eyes	Retinal changes: Grade 1- arteries narrow or tortuous Grade 2- arteriovenous nipping Grade 3- haemorrhages and/or exudates, Grade 4- papilloedema
Vascular system	Asymmetrical, absent or irregular pulses

Hypertension likewise has a strong relationship with obesity, insulin resistance and dyslipidaemias, with the co-existence of these conditions generating the Metabolic Syndrome [9].The management of the patient therefore needs careful assessment of the existence or lack of risk factors; damages to target body organs; the various other diseases connected with the Metabolic Syndrome; and the illness to which hypertension makes a considerable contribution.

- **Management of hypertension**

The goal of treatment is to lower blood pressure in order to avoid or postpone difficulties, without impairing health. The goal high blood pressure need to be <140/90 mmHg, or<130/80 mmHg in persons with diabetes or renal disease, with emphasis on controlling the systolic blood pressure. For individuals with prehypertension, the target must be<120/80 mmHg [5].

Management according to the stage

Pre hypertension (120-139 / 80-90)

• Emphasize lifestyle modification. Reassess at 6-12 months

Stage 1. Uncomplicated hypertension5 (140-159 / 90-99 mmHg)

- Initiate a test of non-drug treatment for six to nine months. If control can not be achieved, after that add medicine therapy. In patients attaining lifestyle modification and whose BP is after that controlled over a period of 12 months, titrate medication therapy down and in a couple of cases it may be possible to withdraw drug treatment.

Stage 2. Uncomplicated hypertension5 (≥160/100 mmHg)

- Commence non-drug and drug treatments. Note: Some patients in the reduced limits of the range with multiple correctable risk aspects could attain considerable decreases of BP on non-drug therapy alone. Such patients, if without target organ damages, might be provided a trial of non-drug treatment alone. Most Stage 2 patients nevertheless will require 2 or even more medicines and lifestyle change.

Stage 3. Uncomplicated hypertension5 (>180/110 mmHg)

• Commence non-drug and drug therapies and review frequently.

• No single drug will be adequate. Most Stage 3 patients will need 3 drugs or more and lifestyle change

• Postural hypotension and other adverse effects are more likely because of greater use of more powerful drugs and/or combined drug therapy.

• Non-adherence or poor adherence is a major problem and must always be considered. Withdrawal may cause rebound hypertension.

- **Initial management**

Initial management of hypertension uses a two-pronged approach, with emphasis on life-style measures and add-on drug management [10].Non-pharmacological therapy (or lifestyle management) has an important role in both non-hypertensive and hypertensive individuals. In non-hypertensive individuals, including those with pre-hypertension, life-style modifications have the potential to avoid hypertension and even more importantly to minimize BP and lower the danger of BP-related clinical difficulties. In hypertensive individuals, lifestyle modifications can serve as initial therapy before the begin of drug therapy and as an accessory to medicine therapy in persons currently on medication. In hypertensive people with medication-controlled BP these treatments could facilitate drug step-down in individuals who could maintain lifestyle modifications.

Treatment succeeds when multiple consider the patient's life are addressed, since essential hypertension is considered as a result of communications in between genetics and environment [11].The environmental impacts are effective and describe the majority of the BP distinctions between people and populations and their control in management of high BP is crucial [11].Vital life-style or ecological aspects are dietary excess of sodium and fat, dietary deficiency of potassium and fiber, alcohol consumption, physical lack of exercise, and psychosocial stress [10] Obesity, especially, truncal obesity are effective near components of high BP, additionally in Indians [12], and life-style influences on their genesis are popular. Significant life-style elements affecting hypertension management.

Dietary factors

Dietary changes are mainstay for prevention and initial therapy of hypertension21. In hypertensive patients, along with a healthy diet, the nutritional sodium consumption need to be restricted to 65 to 100 mmol/day. Various other recommendations are: following a diet low in saturated fat and cholesterol, and one that emphasizes fruits, veggies and low-fat milk products, nutritional and soluble fiber, entire grains and protein from plant sources [13].Alcohol consumption should be regulated.

Reduced salt intake

Proof from animal research studies, epidemiological studies, medical tests, and meta-analyses suggests that with rise in nutritional salt (sodium chloride) consumption, BP also rises. The most convincing evidence concerning the effects of salt on BP originates from rigorously regulated, dosage reaction trials [13]. Each of these trials checked sodium levels and documented significant relationships. The largest of the dosage response tests, the DASH-Sodium trial, examined the impacts of 3 different doses of sodium intakes separately in two distinct diets: the DASH diet and a control diet (more common of what Americans consume). BP decrease was the highest in the team with the lowest sodium levels. In addition, medical tests have documented that a reduced sodium intake could prevent hypertension (relative danger decrease of around 20% with or without concomitant weight-loss), could reduce BP in the setting of antihypertensive medicine, and could facilitate hypertension control24. In observational researches, reduced sodium consumption is associated with a blunted age-related rise in systolic BP. In various other observational research studies, minimized salt consumption is associated with a reduced threat of atherosclerotic cardiovascular occasions and congestive heart failure [13].

The BP reaction to differences and changes in intake of nutritional sodium consumption is heterogeneous [14] (as is the BP reaction to other dietary changes). Despite use of the terms "salt sensitive" and "salt resistant" to classify people in research studies, the modification in BP in reaction to a change in salt intake is not binary. Instead, the decrease in BP from a decreased sodium intake has a constant distribution, with individuals having better or lower degrees of BP reduction [15].In general, the impacts of sodium decrease on BP have the tendency to be better in blacks; middle-aged and older persons; and individuals with hypertension, diabetes, or chronic kidney illness. In Indian arm of the global INTERSALT research, feedback of Indian subjects to dietary sodium was no different from other groups [16].

Increased potassium intake

High potassium intake is related to lowered BP. Although information from individual tests have been inconsistent, 3 meta-analyses of these tests have documented a significant inverted relationship between potassium intake and BP in non-hypertensive and hypertensive individuals [13].In the meta-analysis by Whelton et al [17] average systolic and diastolic BP reductions connected with boost in urinary potassium excretion of 2 g/d (50 mmol/d) were 4.4 and 2.5 mm Hg in hypertensive and 1.8 and 1.0 mm Hg in non-hypertensive people. Offered information recommend that boosted potassium has valuable results on BP in the setup of salt intake that is low. Potassium reduces BP to a greater level in blacks than in whites. A research from India records similar BP decrease with potassium supplementation as observed in the Caucasian whites [18].

Moderation of alcohol intake

Observational research studies and medical trials have recorded a direct, dose-dependent relationship between alcohol intake and BP, particularly when the consumption of alcohol rises over 2 drinks per day [19].Importantly, this relationship has been shown to be independent of potential confounders such as age, obesity, and salt consumption. A recent meta-analysis of 15 randomized controlled tests reported that lowered consumption of alcohol reduced systolic and diastolic BP by 3.3 and 2.0 mm Hg, respectively [20].BP reductions were comparable in non-hypertensive and hypertensive individuals. Available proof sustains small amounts of alcohol intake (amongst those that drink) as an effective method to reduced BP. Alcohol consumption need to be limited to ≤ 2 alcoholic drinks per day in the majority of men and ≤ 1 alcoholic drink each day in women and lighter-weight persons. Note that one drink is defined as 360 ml of regular beer, 150 ml of wine (12% alcohol), and 45 ml of 80-proof distilled spirits.

- **Hypertension and diabetes**

Patients with diabetes mellitus and hypertension have two times the threat of heart disease as non-diabetic hypertensive patients. In addition, hypertension increases the risk of diabetic retinopathy and nephropathy [21].The JNC-7 record along with American Diabetes Association and the National Kidney Foundation suggests an objective BP of <130/80 mm Hg in hypertensive diabetic person patients [23].Many patients with diabetes mellitus will require way of life modifications and 3 or even more medications to accomplish the BP goals. Fulfilling these goals might be difficult in some patients. The balance is benefit from reduced BP with price of medication, adverse effects, and dangers associated with the lower objectives in some patients. Before starting medication therapy, it is necessary to measure BP in the standing position to detect orthostatism, the presence of which might be a hint to autonomic neuropathy and would certainly necessitate a change to the therapy method. Various studies have revealed the effectiveness of ACE preventions and ARB in retarding development of diabetic nephropathy

[23].For diabetic patients with nephropathy, the American Diabetes Association guidelines suggest ACE inhibitors as first medications of option in kind 1 diabetes mellitus yet ARBs in type 2 diabetes [22].In some researches, the incidence of cardiac events has been greater in diabetic patients treated with dihydropyridine CCBs, as compared with ACE inhibitors73. Beta blockers must be considered in the setting of coronary artery illness, and usual co-morbidity in patients with diabetes.

- **Hypertension and kidney disease**

Aggressive control of raised BP can slow development of renal damage and delay or prevent the advancement of end-stage illness. The currently recommended goal BP for patients with kidney illness is <130/80 mm Hg. Likewise, patients with chronic kidney condition are at high danger for cardiovascular morbidity and death. As a result, in addition to raised BP, various other flexible cardiovascular danger factors need management. ACE inhibitors and ARBs may be more efficient than various other medicines in slowing progression of proteinuric kidney disease. Serum creatinine concentrations frequently increase acutely when these medicines are utilized, so serum creatinine and potassium ought to be determined within several days of initiating therapy. An increase in creatinine is not a reason to quit the medicine unless it is excessive or related to serious hyperkalaemia. Concomitant use of potassium-sparing diuretics, potassium supplements, or nonsteroidal anti-inflammatory drugs need to be avoided. A consistent increase in creatinine with therapy raises the probability of renal artery stenosis. Most patients with kidney disease will certainly need a diuretic as part of the therapy regimen. If the estimated glomerular filtration rate is < 30 ml/min, thiazide diuretics are generally ineffective, and loop diuretics are needed.

Conclusion:

In conclusion, hypertension is a major worldwide problem and one of the most prevalent chronic disease. Most of the subjects have mild to moderate hypertension and the initial methods for management involve lifestyle changes focusing on decrease of dietary salt, fat and alcohol and increase in potassium and vegetables and fruits. Weight management and decrease in obesity and truncal obesity, regular physical exercise, tobacco cessation and anxiety management are essential. Pharmacological therapy needs to be initiated after lifestyle interventions and option of medication depends upon age, the general cardiovascular risk and co-morbidities. Management must concentrate on comprehensive risk reduction for better prognosis.

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