HYPERTENSION AND CARDIOVASCULAR RISK FACTORS: INTERVENTION BY THE FAMILY PHYSICIAN

Hypertension is a common presentation and a known risk factor for cardiovascular disease.

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The primary care physician plays a vital role as a core gate-keeper for prevention, diagnosis and treatment of hypertension. About 90% of the adult population in developed countries have at least one consultation per annum with their primary health care physicians. The percentage is lower in developing countries. Few large-scale studies have been undertaken at primary care level to provide sufficient information about the prevalence of the risk factors at this level.

A number of clinical trials have demonstrated a reduction in cardiovascular events following effective reduction of high blood pressure (BP). Despite these findings, BP control rates in primary care settings remain suboptimal (< 50%). Hence the postponement of the goal set by the National Center for Health Statistics (USA) of 50% control of BP (systolic/diastolic BP < 140/90 mmHg) by the year 2000 - 2010.

There are risk factors predisposing a patient to develop hypertension; at the same time, hypertension is one of the risk factors for the development of cardiovascular disease (CVD). In this article, hypertension is discussed from both perspectives.

RISK FACTORS FOR HYPERTENSION

The risk factors predisposing a patient to hypertension are listed in Table I. Although these factors may not be the direct cause of hypertension, they are strongly associated with it.

It is an established fact that BP tends to increase with age, is more prevalent in patients of African descent and runs in families. An estimated 60 - 65% of patients with diabetes mellitus have high BP. Individuals who are physically active, have a normal body mass index (BMI), take alcohol moderately and cut down on salt, reduce their risk of developing hypertension. However, patients need to be aware that hypertension may occur in the absence of the listed risk factors. Hypertension, in turn, is a risk factor for development of cardiovascular events.

Table I. **Risk factors for hypertension**

Non-modifiable	Modifiable
• Age	• Overweight and obesity
• Race	• Excess salt diet
• Family history of hypertension	• High saturated fat diet
• Diabetes mellitus	• Excess alcohol intake
	• Sedentary lifestyle
	• Stress

CARDIOVASCULAR RISK FACTORS

A brief outline of cardiovascular risk factors is given below and in Table II. These are risk factors for the development of cardiovascular events (e.g. angina, myocardial infarction, coronary heart disease, stroke and transient ischaemic attacks).

Hypertension

Hypertension is a risk factor for stroke, myocardial infarction, cardiac and renal failure. Studies on BP-lowering treatment have shown risk reduction in cardiovascular events (40% for stroke, 8% for myocardial infarction, and 10% for cardiovascular mortality). Hypertension needs to be understood not only as a disease but also as a risk factor for other diseases.

Table II. **Cardiovascular risk factors**

Primary risk factors	Secondary risk factors
Modifiable	Modifiable
• Hypertension	• Sedentary lifestyle
• Cigarette smoking	• High BMI (≥ 25 kg/m^2)
• Dyslipidaemia	• Excess alcohol intake
• Diabetes mellitus	
Non-modifiable	Non-modifiable
• Age (> 55 years men; > 65 years women)	• Family history of early onset of CVD
• Sex (men, postmenopausal women)	• Men aged < 55 years
	• Women < 65 years

Hypertension, diabetes mellitus, atrial fibrillation, hypercholesterolaemia, smoking, obesity and excess alcohol intake have all been found to be modifiable risk factors for stroke. However, hypertension is the most modifiable risk factor. Therefore, effective BP management should be accompanied by proper control of the other identified and co-existent risk factors, because a hypertensive patient's prognosis depends more on the sum of his/her risk factors than on the BP alone.

Cigarette smoking

The risk of CVD in smokers is proportional to the number of cigarettes smoked and how deeply the smoker inhales, and is greater in women than in men. The risks of pipe and cigar smokers fall between those of non-smokers and cigarette smokers for ischaemic heart disease. Cigarette smoking is one cause of reduced HDL cholesterol.

Dyslipidaemia

Common clinical presentations of hyperlipidaemia are the symptoms and signs of obliterative atheromatous arterial disease affecting the brain (cerebral transient ischaemic attacks, stroke), heart (angina, myocardial infarction), lower extremities (intermittent claudication), and intestines. Total serum cholesterol values above 6.5 mmol/l, or LDL > 4 mmol/l, or HDL (men < 1 mmol/l; women < 1.2 mmol/l) are associated with a high risk for coronary artery disease. Weight reduction and increased exercise have been found to elevate HDL-cholesterol levels.

All patients in all settings (including rural) need to have their blood cholesterol measured. The notion that coronary heart disease in black hypertensives is not a major risk factor no longer holds as black people lead a more westernised lifestyle.

Diabetes mellitus

Diabetes mellitus is one of the strongest modifiable risk factors for CVD. It often co-exists with obesity, dyslipidaemia, hypertension and hyperuricaemia (metabolic syndrome). Patients with this syndrome are particularly predisposed to atherosclerotic disease. There is strong evidence that, in patients with insulin resistance, vascular abnormalities such as hypertension and atherosclerosis precede the onset of type 2 diabetes mellitus so that by the time diabetes is diagnosed, hypertension is already present.

Sedentary lifestyle

Physical inactivity has been shown to increase the risk of hypertension by 30%. Physical fitness is an independent predictor of cardiovascular mortality. Numerous randomised clinical trials have shown that moderate consistent exercise reduces the risk of development of coronary artery disease (CAD) in high-risk patients.

Obesity

Obesity in men, particularly truncal, has been found in some studies to be an independent risk factor for CAD. A waist circumference of more than 102 cm for men, and more than 88 cm for women, suggests a high risk of CAD. Lower cut-off values should be considered for racial groups whose average height and weight is low.

Obesity is strongly associated with the metabolic syndrome (a condition including obesity, high triglyceride levels, low HDL levels, high BP and high fasting plasma glucose levels). Three out of every 5 obese men suffer from the metabolic syndrome, compared with 1 in 5 overweight men, and 1 in 20 normal-weight men.

Age, sex and family history of coronary artery disease

These are non-modifiable risk factors that the family doctor needs to consider. Regular patient follow-up and management needs to be arranged, especially for those aged more than 60 years.

THE FAMILY PHYSICIAN'S INTERVENTION: PRACTICAL STEPS

A family physician should help the patient translate medical targets into realistic personal goals.

Achieve normal BMI (< 25 kg/m^2)

- Set a reachable weight loss goal (e.g. 1 kg per week).
- Reduce consumption of fat overall (substitute healthier fats like olive oil).
- Lose weight gradually by introducing permanent changes in daily diet for the whole family.

Alcohol intake ≤ 30 ml/day

- Consume no more than 2 beers or 1 glass of wine or 1 mixed alcoholic drink per day.

Exercise

- Increase physical activity as part of daily routine, e.g. take a regular

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walk, get off the bus 6 blocks from home.
- The patient needs to be able to double his/her evening heart rate during the daily exercise routine.

Smoking cessation

The family physician may employ the motivational interviewing technique to try to change the patient's behaviour. The strengths of this technique are its recognition that behavioural change is a process and not an event, allowing the patient self-evaluation of the benefits and losses associated with making the decision, and ultimately helping the patient to come to an 'owned' decision which is more likely to lead to lasting positive change. It must be emphasised that this technique is acquired through special training.

Dietary sodium intake ≤ 2.4 g/day

- Identify and inform patients about all high-sodium foods (e.g. potato chips, hot dogs) that can be omitted from the diet.
- Recommend low-sodium foods (e.g. dried fruit, unsalted nuts).
- Food not to be salted when cooking, but salt only to be added at the table.
- No seasoning for foods eaten with smoked meats, e.g. bacon (already contains salt).

Maintain RDA for potassium (± 90 mmol/l) and calcium as determined by age and sex

- Drink calcium-fortified juices or eat a banana every day.
- If lactose-intolerant, try lactose-free milk.

APPROACH TO ANTIHYPERTENSIVE AGENTS

Lifestyle modification should be followed by the rational selection of a regimen of antihypertensive medication in patients whose hypertension cannot be controlled by lifestyle measures only. The approach to hypertension treatment outlined in the latest South African guidelines is highly recommended.

Selection of an antihypertensive agent must be determined based on the patient's individual risk profile, the likelihood of drug interaction and the accessibility of the medication to the patient. The ultimate goal of antihypertensive treatment must be to provide protection against target-organ damage.

How rapidly should target BP be reached once BP therapy is initiated? Studies indicate that in patients with complex hypertension the goal should be within 6 months.

The Framingham Risk Scale (FRS)

For effective intervention in the management of cardiovascular risk factors, the family physician needs data describing predictors of control in primary care settings. The FRS can be used to calculate 5-year absolute risk of a cardiovascular event (new angina, myocardial infarction, coronary heart disease, sudden death, stroke or transient ischaemic attack). It uses the 6 patient factors as follows:

To estimate an individual's absolute 5-year risk of a cardiovascular event, find the colour block that best describes the patient's sex, age, smoking status, diabetes status (on insulin or oral hypoglycaemics, or fasting blood glucose > 8.0 mmol/l), BP (mean of 2 readings on each of 2 visits), and total cholesterol/HDL-cholesterol ratio. The patient's risk is then read off from the colour code in Key to Tables provided (figures available on **http://merck.micromedex.com/index.asp?**).

The weakness of the FRS is that it does not take into consideration other atherosclerosis risk factors (family history, sedentary lifestyle and obesity).

Besides the FRS, there are other predictive models (Cardiovascular disease life expectancy model, Dundee coronary risk disk, PROCAM risk function, British regional heart study risk function) that can be used. A discussion of their strengths and weaknesses falls outside the scope of this presentation.

CONCLUSION

Patients' awareness of their risk factors for hypertension and cardiovascular disease is crucial to their active participation in their own management. It is the family doctor's responsibility as a primary health care specialist to assist patients to achieve this objective. Patients need to be helped to identify and understand these risk factors in a practical and easy way. The use of the FRS (and other predictive models) is a useful scientific tool to predict the risk of development of cardiovascular events within a specified time period for a particular patient. It could serve as a powerful motivator for lifestyle change by patients.

Further reading

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IN A NUTSHELL

It must be remembered that not only are there risk factors predisposing a patient towards hypertension, but that hypertension itself is a risk factor for developing CVD.

Hypertension, cigarette smoking, hypercholesterolaemia and diabetes are the principal risk factors for CVD.

The hypertensive patient's likelihood of developing CVD depends more on the sum of his/her risk factors than on the BP alone.

The risk of CVD in smokers is proportional to the number of cigarettes smoked and how deeply the smoker inhales.

Total serum cholesterol values above 6.5 mmol/l are associated with a high risk of CAD.

There is strong evidence that, in patients with insulin resistance, vascular abnormalities such as hypertension and atherosclerosis precede the onset of type 2 diabetes mellitus.

Obesity is strongly associated with the metabolic syndrome (a condition including obesity, high triglyceride levels, low HDL levels, high BP and high fasting plasma glucose levels).

A family doctor should help the patient translate medical targets into realistic personal goals.

Selection of an antihypertensive agent must be informed by the patient's individual risk profile, the likelihood of drug interaction and the accessibility of the medication to the patient.

The Framingham Risk Scale (FRS) is a useful tool to calculate the 5-year absolute risk of a cardiovascular event (new angina, myocardial infarction, coronary heart disease, sudden death, stroke or transient ischaemic attack).

SINGLE SUTURE

DRINKING LIKE A FISH

Fish that drink red wine can live up to 60% longer than usual. But these fish are not drinking the finest cabernet. They are being fed resveratrol, a component of red wine that is already known to prolong the life of yeast, flies and nematodes. The idea is that if giving resveratrol to fish prolongs their lives then there is no reason why it should not work with other vertebrates, such as us. Allessandro Cellerino of the Italian Institute of Neuroscience gave 3 different doses of resveratrol to a native Zimbabwean fish that lives for an average of 9 weeks. The lowest dose had no effect, but the fish on the medium dose lived one-third longer and those on the highest doses lived 60% longer. At 12 weeks, by the time all the untreated fish were dead, the fish on the highest dose were still fertile and mentally and physically fit. Resveratrol also apparently protected the fish's brains against deterioration, so could potentially help the elderly stay alert. Carry on drinking the red wine!

Cellerino A, *et al. Curr Biol* 2006; **16:** 296.