

# CardioCase

of the Month

# Hypertension in the Elderly



By Luc Trudeau, MD

## CardioCase Presentation

### Case Facts

- Georges is a 63-year-old retired civil servant.
- He stopped smoking 10 years ago.
- He denies experiencing chest pain during physical exertion and sleeps well using only one pillow.
- He walks daily and avoids salt.
- Under the care of his previous doctor, who has just retired, his blood pressure (BP) has been about 158/80 mmHg.
- He is not taking any medication.
- After hearing a report on the news, he has become concerned that his BP may be too high.

Georges is now directed to you for answers on this matter.

### What's Your CardioCase Diagnosis?

#### About the author ...

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## CardioCase Discussion

### What examination details confirm the diagnosis?

Numerous blood pressure (BP) readings are the way to establish the diagnosis of hypertension (HTN). It is now accepted that an average BP of 140/90 mmHg or higher on several office BP readings is an indication of HTN. Also, this diagnostic BP threshold is the same for patients up to the age of 80. Georges has isolated systolic HTN because his diastolic BP is normal, but his systolic BP average is clearly over the limit. It is a concern since systolic BP is a stronger predictor of cardiovascular risk than diastolic BP.

According to the Canadian Hypertension Education Program recommendations, to establish the diagnosis of HTN, five BP measurement visits are needed over the ensuing six months to obtain an average BP level.<sup>1</sup> In the course of these visits, if the average BP remains 180/105 mmHg or higher, or if there is evidence of target organ damage (TOD) by the third visit, the diagnosis of HTN is certain. Also, it is not uncommon to observe a diminishing BP level throughout the course of the first few visits, as the patient is probably less apprehensive.

### What questions need to be asked?

Certain questions can provide a history of possible effects of BP surplus on major organs, such as the brain, heart, kidneys, and the vasculature. Questions should probe for history of neurologic

deficits (stroke, transient ischemic attack), ischemic heart disease (angina, myocardial infarction), ventricular dysfunction (dyspnea, orthopnea, nocturnal cough), peripheral edema, or claudication. Moreover, a family history of HTN and early familial cardiovascular disease should be recorded. Inquiring about lifestyle habits, such as salt usage, smoking and alcohol use, can also indicate conditions capable of worsening a patient's BP level or inducing resistance to treatment.

### What physical examinations need to be performed?

Naturally, good BP taking is needed. A patient should be seated (back and legs supported) for up to five minutes in a quiet room in order to bring down BP to its basal state. Choice of cuff is also important. Usually, the velcro part has to be fully covered by the flap of the cuff. The use of a cuff that is too small for a big arm will overestimate the BP. Complete heart and lung examination is necessary. An abdominal examination will look for a renal bruit or a mass (*i.e.*, aneurysm, large kidney). Vasculature is examined by performing fundoscopic examination and searching for a carotid or a femoral bruit and palpating peripheral pulses. Presence of rales, enlarged/displaced apical heart impulse, arterial bruit, diminished pulses, or arterial narrowing of the retina are evidence of TOD.

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#### What testing should be done?

All hypertensive patients should have the following readings on chart at the time of diagnosis:

- Complete blood count.
- Plasmatic sodium, potassium, fasting glucose, and creatinine levels.
- Routine urine analysis.
- Electrocardiogram (ECG) with 12 leads.
- Chest X-ray, if cardio-pulmonary disease is suspected.
- Fasting total cholesterol, low-density lipoprotein (LDL) cholesterol, high-density lipoprotein (HDL) cholesterol, and triglycerides.
- Uric acid, if history of gout or if a diuretic is to be used.

#### How do I treat this patient?

According to the latest Canadian Hypertension Survey, patients like Georges are commonly hypertensive. Indeed, more than 50% of individuals aged 60 and over have a BP of at least 140/90 mmHg. This reading is explained by the fact that, as patients get older, a continuing rise in systolic BP is observed. This rise is attributed to the presence of stiffer large arteries that are less compliant. On the flip side, diastolic BP has a tendency to slightly drop after the age of 55. These age-related BP changes create a situation in older patients where the incidence of HTN is much higher, yet where only the systolic BP is high. With this condition (isolated systolic HTN), the

pulse pressure, which is the difference between systolic and diastolic BPs, is quite elevated (> 60 mmHg). Along with systolic BP, high pulse pressure is also a strong predictor of cardiovascular events. The MRFIT (Multiple Risk Factor Intervention Trial) study attests to this fact, as most cardiovascular events and mortality occurred in patients with the highest systolic BP but with the lowest diastolic BP.<sup>2</sup>

Treating HTN in the elderly (*i.e.*, over the age of 60) has achieved clear benefits: a 20% reduction in global mortality (33% in cardiovascular mortality); a 40% reduction in stroke; and a 15% reduction in coronary events. In the case of isolated systolic HTN, the incidence of cardiovascular events was shown to have been reduced by 32% and 31% in the SHEP (Systolic Hypertension with Elderly Program) and SYST-EUR (Systolic Hypertension in Europe) studies, respectively.<sup>3,4</sup>

To reach the magnitude of this benefit, it is crucial to treat with the intent to reach target BP levels. Systolic BP is to be lowered to < 140 mmHg and diastolic BP is to be kept < 90 mmHg (< 130/80 mmHg for a diabetic). Georges had a normal blood count and normal plasmatic sodium, potassium glucose and creatinine. His lipid profile was unremarkable. The physical examination was normal. The urinalysis was negative and the ECG was within normal limits. With these facts in hand, this patient's risk

**Treating hypertension in the elderly has resulted in a 20% reduction in global mortality and a 40% reduction in stroke.**

should be stratified.

All hypertensive patients should be prescribed lifestyle changes. Specifically in the elderly population, salt intake should be lowered (40 mmol less Na/day) as it was shown in the TONE (Trial of

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Nonpharmacologic Interventions in Elderly) trial that this measure decreases systolic BP and event rate.<sup>5</sup> Also, regular physical activity (120 minutes/week), can decrease systolic BP by 10 mmHg. Losing 4.5 kg can decrease systolic BP by 7 mmHg and a diet rich in fibres (*i.e.*, fruits, vegetables) and low in fat (*i.e.*, the DASH diet) can bring down systolic BP as well. As a general measure, smoking is to be discouraged and heavy alcohol intake to be avoided. Beware of nonsteroidal anti-inflammatory drugs (NSAIDs) given regularly for more than one week, as they can raise systolic BP by almost 6 mmHg.

Georges' BP average is in the Grade 1 category, but because of his age being an additional risk factor for cardiovascular disease, his global risk rises to the medium range. (Age becomes an additional risk factor for men after age 55 and for women after age 65)

### What followup is required?

If BP control is not achieved with lifestyle changes for low- (after 12 months) and medium- (after six months) risk patients, medication is to be prescribed. On the other hand, patients deemed at high and very high risk should be put on medication at the time of diagnosis.

First-line drugs recommended for use in uncomplicated HTN are low-dose thiazide diuretics, calcium-channel blockers (*i.e.*, long-acting dihydropyridines) and angiotensin converting enzyme (ACE) inhibitors. Alpha blockers given in monotherapy are to be avoided because of only partial cardiovascular protection and beta blockers lose their effectiveness in primary prevention in this age group and provide

only partial protection. Because of the LIFE (Losartan Intervention For Endpoint reduction in hypertension study) trial and the SCOPE (Study on Cognition and Prognosis in the Elderly) trial, angiotension receptor blockers (ARBs) are to be officially recommended as first-line drugs.<sup>6,7</sup>

For patients with isolated systolic HTN, the SHEP and SYST-EUR trials showed clear benefits using a thiazide or a dihydropyridine calcium channel blocker.<sup>3,4</sup> The recently presented subset analysis of this type of hypertensive patient contained in the LIFE trial population suggests possible use for ARBs as well. However, at least half of patients will need additional medication and effective combinations should be sought. Useful combinations are a low-dose thiazide diuretics with an ARB or an ACE inhibitor, and a long-acting dihydropyridine with a beta blocker or an ACE inhibitor.

### When should I refer this patient?

When a patient takes more than two drugs, including a diuretic, and BP does not reach target, this


condition is called refractory HTN. This form of resistance is usually seen with poor adherence to therapy, continuing high sodium intake or alcohol abuse. This should be discussed with the patient. It could also be a manifestation of a white coat component or of a secondary cause for HTN. It is rarely the manifestation of very hard arteries, a condition that requires a compressive pressure higher than the actual intra-arterial pressure (pseudo-HTN).

For all those reasons, a patient with refractory HTN should be referred to a specialised clinic for ambulatory BP monitoring and further investiga-



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tion. Referral is also to be considered in patients with a suspected secondary cause, in patients developing target organ damage and in patients who experience a clinical event during treatment. 

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#### Suggested Readings

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