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Severe hypertension treatment nice guidelines

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Hypertension Management at a Glance 1352Acknowledgments 1354References 1354To align with its mission to reduce the global burden of raised blood pressure (BP), the International Society of Hypertension (ISH) has developed worldwide practice guidelines for the management of hypertension in adults, aged 18 years and older. The ISH Guidelines Committee extracted evidence-based content presented in recently published extensively reviewed guidelines and tailored and standards of care in a practical format that is easy-to-use particularly in low, but also in high resource settings – by clinicians, but also nurses and community health workers, as appropriate. Although distinction between low and high resource settings often refers to high (HIC) and low- and middle-income countries (LMIC), it is well established that in HIC there are areas with low resource settings, and vice versa. Herein optimal care refers to evidence-based standard of care articulated in recent guidelines^{1,2} and summarized here, whereas standards recognize that standards would not always be possible. Hence essential standards refer to minimum standards of care. To allow specification of essential standards of care for low resource settings, the Committee was often confronted with the limitation or absence in clinical evidence, and thus applied expert opinion. In the Guidelines, differentiation between optimal and essential standards were not always possible, and were made in sections where it was most practical and sensible. The Guidelines Committee is also aware that some recommended essential standards may not be feasible in low resource settings, for example, out-of-office BP measurements, the requirement of multiple visits for the diagnosis of hypertension, or advising the use of single pill combination therapy. Although challenging to implement, these guidelines may aid in local initiatives to motivate policy changes and serve as an instrument to drive local improvements in standards of care. Every effort should be made to achieve essential standards of care to reduce hypertension-induced cardiovascular morbidity and mortality. **Motivation** Raised BP remains the leading cause of death globally, accounting for 10.4 million deaths per year.³ When reviewing global figures, an estimated 1.39 billion people had hypertension in 2010.⁴ However, BP trends show a clear shift of the highest BPs from high-income to low-income regions, with an estimated 349 million with hypertension in HIC and 1.04 billion in LMICs.⁴ The large disparities in the regional burden of hypertension are accompanied by low levels of awareness, treatment and control rates in LMIC, when compared to HIC. In response to poor global awareness for hypertension (estimated 67% in HIC and 38% in LMIC),⁴ the ISH launched a global campaign to increase awareness of raised BP, namely the May Measurement Month initiative.^{6,7} Despite several initiatives, the prevalence of raised BP and adverse impact on cardiovascular morbidity and mortality are increasing globally, irrespective of income.^{4,5} It is therefore critical that population-based initiatives are applied to reduce the global burden of raised BP, such as salt-reduction activities and improving the availability of fresh fruit and vegetables. To improve the management of hypertension, the ISH has published in 2014 with the American Society of Hypertension, Clinical Practice Guidelines for the Management of Hypertension in the Community (See Section 11: Resources). Recently, we have observed a recent flurry of updated evidence-based guidelines arising mainly from high-income regions and countries, including the United States of America,² Europe,¹ United Kingdom,⁸ Canada⁹ and Japan.¹⁰ New developments include redefining hypertension,² initiating treatment with a single pill combination therapy,¹ advising wider out-of-office BP measurement,^{2,10} and lower BP targets.^{1,2,8,11,12} Low- and middle-income regions often follow the release of guidelines from high-income regions closely, as their resources and health systems to develop and implement local guidelines remain challenging. In Africa only 25% of countries have hypertension guidelines¹³ and in many instances the guidelines are adopted from those of high-income regions. However, the adoption of guidelines from high-income regions are sometimes impractical as low resource settings are confronted with a substantial number of obstacles including severe lack of trained healthcare professionals, unreliable electricity in rural clinics, low access to basic office BP devices and limited ability to conduct basic recommended diagnostic procedures and poor access to affordable high-quality medications. In both low and high-income regions, the ambiguities of latest guidelines are often met with confusion among healthcare providers, anxiety among patients,¹⁴ and they resulted in a call for global harmonization.¹⁵ Guidelines from high-income regions may thus not fit global purpose.¹⁶ Guideline Development Process The 2010 ISH Global Hypertension Practice Guidelines were developed by the ISH Hypertension Guidelines Committee based on evidence criteria, (1) to be used globally; (2) to be fit for application in low and high resource settings by advising on essential and optimal standards; and (3) to be concise, simplified, and easy to use. They were critically reviewed and evaluated by numerous external hypertension experts from HIC and LMIC with expertise in the optimal management of hypertension and management in resource-constrained settings. These Guidelines were developed without any support from industry or other sources. Composition of the ISH Hypertension Guidelines Committee and Selection of External Reviewers The ISH Hypertension Guidelines Committee was composed of members of the ISH Council; they were included on the basis of (1) specific expertise in different areas of hypertension; (2) previous experience with the generation of hypertension guidelines, as well as (3) representation of different regions of the world. A similar strategy was followed concerning the selection of external reviewers with particular consideration of representatives from LMICs. Section 2: Definition of Hypertension In accordance with most major guidelines it is recommended that hypertension be diagnosed when a person's systolic blood pressure (SBP) in the office or clinic is ≥ 140 mm Hg and/or their diastolic blood pressure (DBP) is ≥ 90 mm Hg following repeated examination (see below, Section 3). Table 1 provides a classification of BP based on office BP measurement, Table 2 provides ambulatory and home BP values used to define hypertension; these definitions apply to all adults (>18 year old). These BP categories are designed to align therapeutic approaches with BP levels. High-normal BP is intended to identify individuals who could benefit from lifestyle interventions and who would receive pharmacological treatment if compelling indications are present (see Section 9). Isolated systolic hypertension defined as elevated SBP (≥ 140 mm Hg) and low DBP (10 mm Hg) in repeated measurements, use the arm with the higher BP. If the difference is >20 mm Hg consider further investigation. Standing blood pressure: Measure in treated hypertensives after 1 min and again after 3 min when there are symptoms suggesting postural hypertension and at the first visit in the elderly and people with diabetes. Unattended office blood pressure: Multiple automated BP measurements taken while the patient remains alone in the office provide a more standardized evaluation but also lower BP levels than office measurements with uncertain threshold for hypertension diagnosis.^{17,18,23,24} Confirmation with out-of-office BP is again needed for most treatment decisions. Out-of-office BP measurements (by patients at home or with 24-hour ambulatory blood pressure monitoring [ABPM]) are more reproducible than usual measurements, more closely associated with hypertension-induced organ damage and the risk of cardiovascular events and identify the white coat and masked hypertension phenomena (see below). Out-of-office BP measurement is often necessary for the accurate diagnosis of hypertension and for treatment decisions. In untreated or treated subjects with office BP classified as high-normal BP or grade 1 hypertension (systolic 130–159 mm Hg and/or diastolic 85–99 mm Hg), the BP level needs to be confirmed using home or ambulatory BP monitoring (Table 5).^{1,2,17,21,22} Recommendations for performing home and ambulatory BP measurement are presented in Table 5. White Coat and Masked Hypertension The use of office and out-of-office (home or ambulatory) BP measurements identifies individuals with white coat hypertension, who have elevated BP only in the office (nonelevated ambulatory or home BP), and those with masked hypertension, who have nonelevated BP in the office but elevated BP out of the office (ambulatory or home).^{1,2,17–21,25–27} These conditions are common among both untreated subjects and those treated for hypertension. About 10%–30% of subjects attending clinics due to high BP have white coat hypertension and 10%–15% have masked hypertension. White coat hypertension: These subjects are at intermediate cardiovascular risk between normotensives and sustained hypertensives. The diagnosis needs confirmation with repeated office and out-of-office BP measurements. If their total cardiovascular risk is low and there is no hypertension-mediated organ damage (HMOD), drug treatment may not be prescribed. However, they should be followed with lifestyle modification, as they may develop sustained hypertension requiring drug treatment.^{1,2,17–21,25–27} Masked hypertension: These patients are at similar risk of cardiovascular events as sustained hypertensives. The diagnosis needs confirmation with repeated office and out-of-office measurements. Masked hypertension may require drug treatment aiming to normalize out-of-office BP.^{1,2,17–21,25–27} Section 4: Diagnostic / Clinical Tests Patients with hypertension are often asymptomatic, however specific symptoms can suggest secondary hypertension or hypertensive complications that require further investigation. A complete medical and family history is recommended and should include: Blood pressure: New onset hypertension, duration, previous BP levels, current and previous antihypertensive medication, other medications/over-the-counter medicines that can influence BP, history of intolerance (side-effects) of antihypertensive medications, adherence to antihypertensive treatment, previous hypertension with oral contraceptives or pregnancy. Risk factors: Personal history of CVD (myocardial infarction, heart failure [HF], stroke, transient ischemic attacks [TIA], diabetes, dyslipidemia, chronic kidney disease [CKD], smoking status, diet, alcohol intake, physical activity, psychosocial aspects, history of depression). Family history of hypertension, premature CVD, (familial) hypercholesterolemia, diabetes. Assessment of overall cardiovascular risk: In line with local guidelines/recommendations (see risk scores in Section 11 at the end of the document). Symptoms/signs of hypertension/coexistent illnesses: Chest pain, shortness of breath, palpitations, claudication, peripheral edema, headaches, blurred vision, nocturia, hematuria, dizziness. Symptoms suggestive of secondary hypertension: Muscle weakness/tetany, cramps, arrhythmias (hypokalemia/primary aldosteronism), flash pulmonary edema (renal artery stenosis), sweating, palpitations, frequent headaches (pheochromocytoma), snoring, daytime sleepiness (obstructive sleep apnea), symptoms suggestive of thyroid disease (see Section 10 for full list of symptoms). A thorough physical examination can assist with confirming the diagnosis of hypertension and the identification of HMOD and/or secondary hypertension and should include: Circulation and heart: Pulse rate/rhythm/character, jugular venous pulse/pressure, apex beat, extra heart sounds, basal crackles, peripheral edema, bruits (carotid, abdominal, femoral), radio-femoral delay. Other organs/systems: Enlarged kidneys, neck circumference >40 cm (obstructive sleep apnea), enlarged thyroid, increased body mass index (BMI)/waist circumference, fatty deposits and coloured striae (Cushing disease/syndrome). Blood tests: Sodium, potassium, serum creatinine and estimated glomerular filtration rate (eGFR). If available, lipid profile and fasting glucose. Urine test: Dipstick urine test. 12-lead ECG: Detection of atrial fibrillation, left ventricular hypertrophy (LVH), ischemic heart disease. Additional investigations when indicated can be undertaken to assess and confirm suspicion of HMOD, coexistent diseases or/and secondary hypertension. Imaging Techniques Echocardiography: LVH, systolic/diastolic dysfunction, aortic dilation, aortic coarctation. Carotid ultrasound: Plaques (atherosclerosis), stenosis. Kidneys/renal artery and adrenal imaging: Ultrasound/renal artery Duplex: CT-/MR-angiography: renal parenchymal disease, renal artery stenosis, adrenal lesions, other abdominal pathology. Fundoscopy: Retinal changes, hemorrhages, papilledema, tortuosity, nipping. Brain CT/MRI: Ischemic or hemorrhagic brain injury due to hypertension. Functional Tests and Additional Laboratory Investigations Ankle-brachial index: Peripheral (lower extremity) artery disease. Further testing for secondary hypertension if suspected: Aldosterone-renin ratio, plasma free metanephrines, late-night salivary cortisol or other screening tests for cortisol excess. Urinary albumin/creatinine ratio Serum uric acid (s-UA) levels Liver function tests Section 5: Cardiovascular Risk Factors Diagnostic Approach More than 50% of hypertensive patients have additional cardiovascular risk factors.^{28,29} The most common additional risk factors are diabetes (15%–20%), lipid disorders (elevated low-density lipoprotein-cholesterol [LDL-C] and triglycerides (30%)), overweight-obesity (40%), hyperuricemia (25%) and metabolic syndrome (40%), as well as unhealthy lifestyle habits (eg, smoking, high alcohol intake, sedentary lifestyle).^{28–30} The presence of one or more additional cardiovascular risk factors proportionally increases the risk of coronary, cerebrovascular, and renal diseases in hypertensive patients.^{1A} An evaluation of additional risk factors should be part of the diagnostic workup in hypertensive patients particularly in the presence of a family history of CVD. Cardiovascular risk should be assessed in all hypertensive patients by easy-to-use scores based on BP levels and additional risk factors according to a simplified version of the approach proposed by ESC-ESH Guidelines (Table 6).^{1A} A reliable estimate of cardiovascular risk can be obtained in daily practice by including: Other Risk Factors: Age (>65 years), sex (male/female), heart rate (<80 beats/min), increased body weight, diabetes, high LDL-C/triglyceride, family history of CVD, family history of hypertension, early-onset menopause, smoking habits, psychosocial or socioeconomic factors. HMOD: LVH (LVH with ECG), moderate-severe CKD (CKD; eGFR 6 mg/dl/0.357 mL/min/1.73 m²). An increase in cardiovascular risk must be considered in patients with hypertension and chronic inflammatory diseases, chronic obstructive pulmonary disease (COPD), psychiatric disorders, psychosocial stressors where an effective BP control is warranted.¹ Section 6: Hypertension-Mediated Organ Damage (HMOD) Definition and Role of HMOD in Hypertension Management Hypertension-mediated organ damage (HMOD) is defined as the structural or functional alteration of the arterial vasculature and/or the organs it supplies that is caused by elevated BP. End organs include the brain, the heart, the kidneys, central and peripheral arteries, and the eyes. Figure 1. How to measure blood pressure While assessment of overall cardiovascular risk is important for the management of hypertension, additional detection of HMOD is unlikely to change the management of those patients already identified as high risk (ie, those with established CVD, stroke, diabetes, CKD, or familial hypercholesterolemia). However, it can provide important therapeutic guidance on (1) management for hypertensive patients with low or moderate overall risk through reclassification due to presence of HMOD, and (2) preferential selection of drug treatment based on the specific impact on HMOD. Specific Aspects of HMOD and Assessment Brain: TIA or strokes are common manifestations of elevated BP. Early subclinical changes can be detected most sensitively by magnetic resonance imaging (MRI) and include white matter lesions, silent microinfarcts, microbleeds, and brain atrophy. Due to costs and limited availability brain MRI is not recommended for routine practice but should be considered in patients with neurologic disturbances, cognitive decline and memory loss. Heart: A 12-lead ECG is recommended for routine workup of patients with hypertension and simple criteria (Sokolow-Lyon index: SV1+RV5 ≥ 35 mm, Cornell index: SV3+SV4 >28 mm for men or >20 mm for women and Cornell voltage duration product: >2440 mm-ms) are available to detect presence of LVH. Sensitivity of ECG-LVH is very limited and a