Epidemiology and pathophysiology

Hypertension in the elderly (above the age of 65 years) is an increasing public health concern. Raised blood pressure (BP), especially systolic BP, confers a significant cardiovascular risk and should be actively treated in elderly patients. Even in the very old, (those above the age of 80 years) hypertension is a dominant risk factor; treatment prolongs life and prevents stroke and heart failure. The prevalence of hypertension approaches or even exceeds 50% in people aged 70 and above.

Most elderly people with hypertension have isolated systolic hypertension, defined as systolic BP greater than 140 mm Hg and diastolic BP less than 90 mm Hg. Systolic hypertension is a more potent risk factor than increases in diastolic BP. Sluggish baroreceptor function and reduced cardiovascular sensitivity to catecholamines make the elderly more sensitive to natural or drug-induced falls in BP.

Diagnostic work-up and target-organ damage

There may be diagnostic problems in the elderly and very old people. 'Pseudo-hypertension' should be suspected in older patients who, despite high BP measurements, have minimal vascular damage in the retina and who experience inordinate postural dizziness despite cautious therapy. This is a condition in which there is a major discrepancy between intra-arterial and arm-cuff BPs, such that cuff BPs are falsely high. Pseudo-hypertension is caused by sclerotic changes in the media of the brachial artery and BP should be measured at the wrist or finger, locations otherwise not recommended for BP measurements.

BP readings are far more variable in the elderly, so more readings should be taken initially than for patients in the general population. BP should be measured in both the sitting and standing positions since there is a high frequency (as much as 30%) of a 20 mm Hg or greater fall in BP in patients with a systolic BP over 160 mm Hg. In these circumstances standing BP should be used to guide treatment decisions. Side-effects like dizziness and light-headedness should alert clinicians of possible over-treatment. Prevalence of clinically significant secondary hypertension is low (probably in the 1-5% range).

Ambulatory and home BPs (ABP and HBP)

Guidelines provide detailed suggestions regarding how and when to use ABP monitoring. ABP has been found to be a significant predictor of cardiovascular morbidity, independent of office BP and other risk factors in elderly people and in those with isolated systolic hypertension. The white coat phenomenon, the difference between office BP and ABP, may be more pronounced in the elderly. The 'reversed white coat phenomenon', when ABP is higher than office BP, has also been revealed in a substantial portion of older hypertensives. However, the reproducibility and therefore the clinical utility of the white coat effect have been questioned.

In most people, BP falls at night. The nocturnal dip is less marked with increasing age and disappears in centenarians.

In the Ohasama study, HBP had a greater predictive power for mortality and stroke than screening BP, suggesting the potential usefulness of HBP measurements. However, physical and intellectual limitations, which are more evident in elderly subjects, may curtail more extensive use of HBP monitoring.

Total cardiovascular risk and when to start drug treatment

The same general rules apply to the whole hypertensive population. Calculation of total cardiovascular risk using methods such as those proposed by the European Society of Hypertension-European Society of Cardiology Guidelines is recommended also in the elderly (above 65 years) and old (above 80 years) people. The presence of other cardiovascular risk factors, in particular smoking and high cholesterol, diabetes mellitus, and/or target organ damage such as left ventricular hypertrophy, proteinuria and/or decreased renal function strengthen the indication for drug treatment of even mild hypertension. The ITAVET study showed that reducing systolic BP from approximately 170 to 140 mmHg in patients above the age of 80 years reduces mortality, stroke and heart failure. Treatment of hypertension in very old patients should be restricted to those who are otherwise relatively fit and with at least grade II hypertension. Further research is needed to clarify whether otherwise healthy people above the age of 80 years benefit from drug treatment of mild hypertension. Common concomitant diseases, e.g. coronary heart disease, arrhythmia or heart failure may otherwise decide treatment indication, choice of antihypertensive drugs and intensity. Discontinuation or reductions of antihypertensive drugs may be indicated in severe illness and/or fragile patients.

Evidence based treatment

The 2013 ESH/ESC Guidelines conclude that randomized controlled trials leave little doubt that elderly patients benefit from antihypertensive treatment in terms of reduced cardiovascular morbidity and mortality, irrespective of whether they have systolic-diastolic or isolated systolic hypertension. Benefits in elderly patients have been shown with
representative agents from several classes such as diuretics, beta-blockers, calcium antagonists, angiotensin-converting enzyme inhibitors and angiotensin receptor blockers. Several studies have shown major benefits from treating elderly patients with isolated systolic hypertension and there is no evidence that different classes are differently effective in the younger vs. the older patient. The level of evidence table below is slightly modified from the 2013 ESH/ESC Guidelines.

### Recommendations in the elderly

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<th>Class</th>
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<td>≥ 65 years</td>
<td>I A</td>
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<td>≥ 80 years</td>
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**In elderly hypertensives with SBP ≥ 160 mmHg there is solid evidence to recommend reducing SBP to between 140 mmHg and 150 mmHg**

**In frail elderly patients less than 80 years old treatment may be considered at SBP ≥ 140 mmHg with a target SBP < 140 mmHg if treatment is well tolerated**

**In frail individuals older than 80 years with an initial SBP ≥ 160 mmHg it is recommended to reduce SBP to between 150 mmHg and 160 mmHg**

**In frail elderly patients, it is recommended to base treatment decisions on comorbidity and carefully monitor the effects of treatment**

**Continuation of well-tolerated antihypertensive treatment should be considered when a treated individual becomes octogenarian**

**All hypertensive agents are recommended and can be used in the elderly, although diuretics and calcium antagonists may be preferred in isolated systolic hypertension**

### Summary

There is little doubt from randomized controlled trials that elderly patients benefit from antihypertensive treatment in terms of reduced cardiovascular morbidity and mortality, whether they have systolic-diastolic or isolated systolic hypertension. Several randomized controlled trials of antihypertensive treatment versus placebo or no treatment in elderly (≥ 65 years) and older (≥ 80 years) patients with systolic-diastolic hypertension used a diuretic or a beta-blocker as first line therapy. In trials on isolated systolic hypertension first line drugs consisted of a diuretic or a dihydralazine calcium channel blocker. In all these trials active therapy was superior to placebo or no treatment. Other drug classes have only been used in comparative trials. Benefits have been shown in elderly and older patients for at least one representative agent of several drug classes, including diuretics, beta-blockers, calcium channel blockers, converting enzyme inhibitors and angiotensin receptor antagonists. A more recent meta-analysis of all trials in the elderly and old people showed strong preventive effects on all the common complications.

Initiation of antihypertensive treatment in elderly and old patients should follow the general guidelines. Many patients will have other risk factors, target-organ damage and associated cardiovascular conditions, to which the choice of the first drug should be tailored. Furthermore, many patients will need two or more drugs to control blood pressure, particularly since it is often difficult to lower systolic pressure to below 140 mm Hg or 140-150 mmHg in the very old. Lower treatment target like in the recent SPRINT Study should only be considered if unattended automated office BP is used for measuring BP in the clinic. Regarding the evidence in the frail octogenarians this problem is covered in the recent ESH/ESC guidelines (geriatric society) position paper. However, in short it is recommended to treat serious comorbidity and in many patients abstain from specific antihypertensive therapy.

### References