

Isolated systolic hypertension: a radical rethink

It's a risk factor that needs treatment, especially in the over 50s

The association between hypertension and a “hardening” of the pulse and apoplexy has been recognised for hundreds of years. The major problem in elderly people is isolated systolic hypertension, defined as a raised systolic pressure but normal diastolic pressure. It affects around half of people aged over 60 years.¹ Originally, because isolated systolic hypertension was so common it was considered part of ageing and, like essential hypertension, benign. However, there is now compelling evidence from cross sectional, longitudinal, and randomised controlled trials that show that isolated systolic hypertension confers a substantial cardiovascular risk.^{2,3} Despite this, it remains underdiagnosed and largely untreated.⁴ The roots of this lie in a century of over-reliance on the importance of diastolic pressure and largely unjustified concerns about the potential adverse consequences of treating systolic pressure.

After the mercury sphygmomanometer was introduced, convention dictated that diastolic pressure was a better determinant of cardiovascular risk than systolic pressure. Systolic pressure was thought to vary considerably throughout the day, and a high pressure was believed to reflect a “strong” left ventricle. This view was perpetuated by the reliance of life assurance companies on diastolic pressure and the use of diastolic pressure in the early studies of lowering blood pressure. The use of diastolic pressure was further supported by the discovery that essential hypertension is characterised by increased peripheral vascular resistance and therefore raised mean arterial pressure, which more closely correlates with diastolic than systolic pressure. Evidence that systolic pressure is equally, if not more, important than diastolic, particularly in people over 50, was largely ignored. Although the use of diastolic pressure for risk prediction may be reasonably effective for younger people and people with essential hypertension, data from cohort and intervention studies indicate that it is inappropriate for the over 50s, particularly those with isolated systolic hypertension.⁵

In almost all populations, ageing is associated with a rise in systolic and fall in diastolic pressure, and a widening of the pulse pressure.⁶ This is due to arteriosclerosis.⁷ Isolated systolic hypertension could therefore be seen as something we might all develop given time—and, in contrast to essential hypertension, it is not associated with any appreciable change in peripheral resistance. Nevertheless, isolated systolic hypertension is not a benign condition. Indeed, pulse pressure is a better predictor of cardiovascular events than systolic or diastolic pressure alone in people aged over 50.⁵ The latest data from the Framingham study (based on 2000 men and women aged 50-79 at the onset of the study, none of whom had clinical evidence of coronary heart disease) indicate that for any given quarter of systolic pressure, events are inversely related to diastolic pressure (the lower the diastolic pressure the higher the risk), showing, at least in the over 50s, that arterial stiffness is a key determinant of cardiovascular risk.⁸

Despite continued reluctance to accept isolated systolic hypertension as a discrete pathological entity, the benefits of treatment are established.^{2,3} The relative risk reduction of cardiovascular events in elderly people with isolated systolic hypertension, reported in the latest Cochrane review, is similar to that in younger people.⁹ However, as elderly people are at much higher absolute risk of such events, they stand to benefit more from treatment than younger people.⁹ Indeed, the number needed to treat to prevent one stroke in people with isolated systolic hypertension is around half that found in a study of mild hypertension.^{9,10} Moreover, elderly people tolerate antihypertensive drugs with few side effects.⁹ Yet patients with isolated systolic hypertension remain underrecognised and undertreated.⁴

The latest World Health Organization and International Society of Hypertension guidelines for the management of hypertension emphasise the importance of arterial stiffness and pulse pressure as predictors of cardiovascular risk and call for further investigation of the prognostic relevance of other indices of arterial stiffness.¹¹ The enemy today is no longer arterial pressure taken in isolation, but a collection of factors, of which age and doctors' conservatism are among the most important.¹² It is about time that we recognised isolated systolic hypertension as an important clinical condition and changed our practice accordingly.

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