Orthostatic hypotension (OH) is common in adults and, when accompanied by symptoms (dizziness, light-headedness, or fainting), carries an increased risk of falls, fractures, and mortality.\(^1\) Symptoms are attributed to transiently reduced cerebral perfusion. The underlying causes of OH are numerous and include dehydration, \textquotedblleft autonomic dysfunction,\textquotedblright and medications that affect vascular compliance or responsiveness to autonomic reflexes.\(^2\) Risk factors for OH in population-based studies include age, hypertension, hypertension treatment, diabetes mellitus, and sedative/hypnotic medication use.\(^3\)

To standardize the assessment and diagnosis of OH, the American Autonomic Society and American Association of Neurology define OH as a decrease in systolic blood pressure (BP) of \(\geq 20\) mm Hg or diastolic BP of \(\geq 10\) mm Hg within 3 minutes of standing.\(^2\) Recently, the availability of continuous BP monitoring during provocative testing (going from seated to standing) has provided opportunities to further characterize patterns of OH that may have prognostic value or physiologic relevance. Although there is now a consensus on the definitions of OH and its variants, few studies have assessed the prevalence of OH and its variants in the general population. This lack of data likely reflects the absence of a simple assessment tool, which is necessary in population-based studies.

In this issue of Circulation, Finucane and colleagues\(^4\) present results of a population-based, nationally representative survey on the prevalence of OH in adults in Ireland. The investigators use a novel continuous monitor (Finometer) for waveform analysis of beat-to-beat BP measurements during provocative testing. For this test, participants were supine for 10 minutes, at which time they stood for 2 minutes while the monitor recorded BP continuously. At 2 minutes, participants were also asked to report symptoms of \textquotedblleft orthostatic intolerance.\textquotedblright In this article, OH was defined as a decrease in systolic BP of \(\geq 20\) mm Hg or diastolic BP of \(\geq 10\) mm Hg at 2 minutes of standing, in contrast to the standard 3-minute test. The authors also report 2 variants of OH. The variant, initial OH, was defined as a drop in systolic BP of \(\geq 40\) mm Hg or diastolic BP of \(\geq 20\) mm Hg within 15 seconds of standing accompanied by symptoms (eg, dizziness or light-headedness). The variant, impaired BP stabilization, was based on the time course of BP monitoring and was defined by a lack of return to baseline BP after 40 seconds.\(^5\)

The Table summarizes the principal findings of the survey. With increasing decade of life, the prevalence of OH also increased, from 4.2\% in 50- to 59-year-old subjects to 18.5\% in those \(\geq 80\) years of age. Initial OH was highly prevalent (\(\approx 35\%\)) and did not vary by age. The prevalence of impaired BP stabilization, defined as a lack of return to baseline BP at 40 seconds on standing, increased with each decade and affected \(\approx 40\%\) of those \(\geq 80\) years of age.

The relevance of these findings to clinical management of patients with OH is uncertain, given the lack of prospective data on outcomes and the overriding clinical importance of whether there were concurrent symptoms. It is well recognized that most patients with OH are asymptomatic.\(^6\) Typically, reports of OH symptoms (eg, mild and fleeting light-headedness, feeling dizziness or faint, or after a report of syncope) will prompt a clinical evaluation. OH associated with orthostatic symptoms is most relevant to initiating further diagnostic evaluations and in making treatment decisions. However, there are no guidelines on clinical decision making in those with OH but without symptoms.

Measurement of OH in asymptomatic patients is presumably done for the purpose of identifying persons who are at high risk for falling. However, the relationship of OH with subsequent falls has been inconsistent in observational studies.\(^7,8\) In a large cohort of community-dwelling adults in Boston, OH was not associated with a greater risk of falls overall, only in a subgroup of those with uncontrolled hypertension. Poor vision, balance and gait problems, vertigo, muscle atrophy, comorbid conditions, and medication use might be more important risk factors for falls than OH.

Identification of OH in patients who are symptom free may create diagnostic and therapeutic dilemmas. Detection of OH in the clinic with the continuous monitoring device would add a great deal of data but would further complicate BP management. For example, a clinician may be reluctant to escalate antihypertensive drug treatment in an asymptomatic patient with OH, even if the patient has not achieved BP control. Large epidemiological studies have shown that antihypertensive medications are associated with increased risk of serious fall injuries, and some question the value of aggressive
BP lowering in the elderly. The high prevalence of OH in the elderly and the perceived risk of falls led, in part, to the new Eighth Joint National Committee recommendation that raised the systolic BP treatment threshold from <140 to <150 mm Hg. On the other hand, there is substantial concern that the new Eighth Joint National Committee recommendation might increase the risk of stroke. Furthermore, there is much debate on whether withdrawing antihypertensive medications on the basis of OH is justified, especially in the absence of symptoms.

Trials of aggressive versus standard BP goals provide some reassurance that lower BP, although increasing OH symptoms, does not increase the risk of falls or fractures. In the Action to Control Cardiovascular Risk in Diabetes (ACCORD) trial, a large, randomized trial of intensive goal (systolic BP <120 mm Hg) versus standard BP goal (systolic BP <140 mm Hg) in patients with type 2 diabetes mellitus, the intensive BP goal was not associated with an increased risk of falls or fractures at the 1-year follow-up. In the Stop Atherosclerosis in Native Diabetics Study (SANDS) trial, there were greater reports of dizziness (35% versus 17%), but not falls, in the aggressive compared with the standard BP group. In the Secondary Prevention of Small Subcortical Strokes (SPS3) trial, which randomized adults after lacunar infarction, a lower BP target was associated with a trend toward an increased risk of orthostatic syncope but a lower trend for recurrent stroke. For milder symptoms such as dizziness, which can often be managed by behavior modification, for example, sitting on the side of the bed before standing, the risk of falling for those with OH may be far less than the risk of a cardiovascular disease (CVD) event that may occur after antihypertensive therapy is stopped or BP treatment goals are liberalized.

A critical factor in making decisions on medication titration is patient preference. In a cross-sectional survey of cognitively intact adults with hypertension who were at risk for falls, 50% reported a preference for maintaining better BP control with the potential of reducing CVD risk, and the other 50% had a preference for reducing OH symptoms from a lower dose or withdrawal of medication. The percentage of participants who prioritized CVD risk reduction was less in those with lower education, those with lower income, and those in poorer health.

The study by Finucane et al has several limitations that should be considered. First, it was a cross-sectional study. Establishing the relationship of OH (and its variants) with CVD or falls risk requires prospective studies. It is premature, on the basis of the available cross-sectional data, to advocate for routine OH testing without such research. Second, the population from which the normative data were derived is homogeneous in race/ethnicity. The patterns of OH described here may not be relevant to populations with different dietary patterns, sodium intake, medication use, or CVD risk profiles. Third, it is important to distinguish usual from normal prevalence of OH. The data reported in this article reflect a population with a high prevalence of hypertension and a high risk of vascular disease, that is, usual rates. With efforts to promote cardiovascular health and prevent hypertension, rates of OH might fall and reflect normal prevalence in a less diseased population. Fourth, the authors did not assess risk factors with OH (and its variants) and did not provide any information on how or when OH symptoms were assessed or what questions were used to assess them during the testing. Fifth, the duration of the provocative test, 2 minutes, was less than the 3 minutes recommended by professional organizations. Lastly, the investigators used the Finometer. This device uses a finger BP cuff, with return flow calibration and height correction algorithms; it was judged to provide “reliable BP values” (with an estimated grade of A/B by British Hypertension Society standards). However, independent testing of the Finometer as an accurate measure of BP by international standards is unavailable. Whether this device could be incorporated into routine care also needs to be assessed.

In conclusion, the authors document a high prevalence of age-associated OH in a representative sample of adults from Ireland. The continuous beat-to-beat monitoring provided by the Finometer device during the seated-to-standing change highlights the high prevalence of OH in the population, particular in the elderly. However, the clinical relevance of these findings must be established before routine testing in asymptomatic patients can be recommended.

Disclosures

None.

References


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High Prevalence but Uncertain Clinical Significance of Orthostatic Hypotension Without Symptoms
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