

## Cerebral perfusion in neurogenic orthostatic hypotension

The excellent overview of neurogenic orthostatic hypotension (OH) by Low and Singer<sup>1</sup> is limited in its discussion of cerebral perfusion. The authors state that “within a mean blood pressure range of 50–150 mm Hg, a change in blood pressure results in an insignificant change in cerebral perfusion” and that “patients with OH...have an expansion of the autoregulated range...hence the common absence of symptoms”.

This section might provide readers with a false impression that they need not worry about the effects of OH on brain perfusion. The authors’ remarks refer to the classic concept of static autoregulation.<sup>2</sup> The stability of cerebral perfusion in this concept applies only to steady-state situations, such as supine hypertension in patients with orthostatic hypertension. Although Lassen’s classic graph suggested a “plateau-phase” within the blood-pressure range of 50–150 mm Hg, cerebral blood flow actually decreases or increases by about 20%, which is hardly insignificant.<sup>2</sup>

Furthermore, when it comes to rapid orthostatic changes in blood pressure, the static autoregulation concept is no longer valid. Studies of the dynamic pressure–flow association of the cerebral circulation have shown that flow changes substantially in response to sudden changes in pressure even if autoregulation operates normally.<sup>2,3</sup> The study by Novak and colleagues<sup>4</sup> illustrates this and shows that some patients with OH have impaired rather than improved autoregulation. Because symptoms of OH are caused by cerebral hypoperfusion, the interaction between cerebral autoregulation and blood pressure determines the clinical consequences, and not the blood pressure itself.

Finally, I am worried about how readers will interpret the advice for “a regimen that relieves symptoms...with a supine blood pressure that does not usually exceed 180/110 mm Hg...”.

Although the authors acknowledge that supine hypertension is best prevented, the suggestion that these blood-pressure limits are acceptable is, in my view, at odds with the importantly increased risks for stroke, heart failure, and mortality associated with these values, certainly in elderly people.<sup>5,6</sup>

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I have no conflicts of interest.

1 Low PA, Singer W. Management of neurogenic orthostatic hypotension: an update. *Lancet Neurol* 2008; **7**: 451–58.

2 van Beek AH, Claassen JA, Rikkert MG, Jansen RW. Cerebral autoregulation: an overview of current concepts and methodology with special focus on the elderly. *J Cereb Blood Flow Metab* 2008; **28**: 1071–85.

3 Zhang R, Witkowski S, Fu Q, Claassen JA, Levine BD. Cerebral hemodynamics after short- and long-term reduction in blood pressure in mild and moderate hypertension. *Hypertension* 2007; **49**: 1149–55.

4 Novak V, Novak P, Spies JM, Low PA. Autoregulation of cerebral blood flow in orthostatic hypotension. *Stroke* 1998; **29**: 104–11.

5 Beckett NS, Peters R, Fletcher AE, et al. Treatment of hypertension in patients 80 years of age or older. *N Engl J Med* 2008; **358**: 1887–98.

6 Zhang H, Thijs L, Staessen JA. Blood pressure lowering for primary and secondary prevention of stroke. *Hypertension* 2006; **48**: 187–95.