

## Hemodynamic Significance of Heart Rate in Neurally Mediated Syncope

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### Summary

**Background:** Vasovagal and vasodepressor syncope are used interchangeably in the literature to describe the common faint syndrome, now collectively named neurally mediated syncope. The significance of heart rate (HR) in these reflex-induced reactions remains unclear.

**Hypothesis:** The study was undertaken to investigate the hemodynamic significance of HR in tilt-induced neurally mediated syncope.

**Methods:** In all, 113 patients with syncope of unknown etiology were studied by head-up tilt test with invasive hemodynamic monitoring. Thirty-five patients (15 women, 20 men, age range 21 to 72 years) developed syncope and were enrolled for analysis. The hemodynamic data were compared between patients who developed bradycardia (vasovagal group,  $n = 15$ ) and those without bradycardia (vasodepressor group,  $n = 20$ ).

**Results:** The baseline hemodynamic data (mean  $\pm$  standard deviation) and the hemodynamic responses after 10-min head-up tilt were similar between patients in the vasovagal and vasodepressor groups. During syncope, patients with vasovagal reaction developed hypotension and paradoxical bradycardia (HR =  $52.4 \pm 5.9$  beats/min), while patients with vasodepressor reaction developed a precipitous drop in arterial blood pressure with inappropriate HR ( $105 \pm 21$  beats/min) compensation. Patients with vasovagal syncope manifested a significantly lower cardiac index and a significantly higher systemic vascular resistance index than patients with vasodepressor syncope ( $1.47 \pm 0.29$  vs.  $1.97 \pm 0.41$  l/min/m<sup>2</sup>,  $p < 0.001$  and  $2098 \pm 615$  vs.  $1573 \pm 353$  dynes·s·cm<sup>-5</sup>·m<sup>2</sup>,  $p < 0.003$ , respectively). A positive correlation existed between HR and cardiac index ( $r = 0.44$ ,  $p = 0.008$ ) during syncope in the patients studied.

**Conclusions:** These findings suggest that the hemodynamic characteristics of vasovagal and vasodepressor reactions are different, and that HR plays a significant role in neurally mediated syncope.

**Key words:** syncope, vasovagal, vasodepressor, hemodynamics

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