

Differentiating Between Postural Tachycardia Syndrome and Vasovagal Syncope

Jeffrey B. Anderson, MD, MPH, MBA, Martha W. Willis, RN, MS, CNS, CNP-PC/AC

Postural orthostatic tachycardia syndrome (POTS) is a clinical entity characterized by orthostatic intolerance that includes an increase in heart rate of at least 30 bpm when one changes from a supine to an upright position within the first 10 minutes of standing without prolonged bed rest, medications, or other chronic debilitating disorders that impair autonomic reflexes. Clinical complaints in patients with POTS include dizziness, fatigue, confusion, and vision and hearing changes that are felt to be due to decreased cerebral blood flow. POTS is a multisystem disease leading to functional impairment similar to a chronic lung or heart condition and comprises a mixed group of varied disorders associated with similar clinical symptoms.¹ Receiving a diagnosis of POTS can be psychologically debilitating.² POTS may profoundly impact one's quality of life and basic functioning.³ Appropriate management of and attention to POTS can increase patient quality of life and decrease patient and family anxiety.²

Vasovagal syncope (VVS), also known as neurocardiogenic syncope or a "simple faint," is the most common cause of loss of consciousness in childhood.^{4,5} VVS is characterized by inappropriate vasodilatation leading to transient neurally mediated systemic hypotension and bradycardia resulting in low cerebral blood flow and loss of consciousness.¹ VVS in pediatrics is often associated with a positive family history, growth spurt, menstrual cycle, or rapid weight loss.¹ VVS is a

benign, self-limited problem and is not typically a chronic problem associated with multisystem complaints.

Differentiating between POTS and VVS can be challenging, but is important in determining treatment and offering anticipatory guidance for patients and families. Differentiation also allows for proper medical management as well as appropriate anticipatory guidance on the natural history of the presenting problem.¹ Typically, a comprehensive history and physical examination are sufficient to differentiate these 2 entities. One test that has been used in attempts to diagnose these problems is the head-up tilt (HUT) table test. Although some experts still recommend HUT in evaluating this population, several studies have demonstrated suboptimal results when using this test in pediatrics.^{1,6-9} Half of the patients with initial positive tilt tests had negative tests when repeated with either placebo or treatment.³ Perhaps because of the difficulty of interpreting the results, the use of HUT testing in children and adolescents is declining. A recent query of members of the Pediatric and Congenital Electrophysiology Society found that 24% of the responding pediatric electrophysiologists no longer perform HUT table tests and 76% perform <10 HUT table tests per year.⁹ In their analysis in this issue of *Pediatrics*, Medow and colleagues¹⁰ examined the utility of HUT in differentiating between POTS and VVS. They performed HUT on patients with recurrent VVS and matched control

Department of Cardiology, Cincinnati Children's Hospital Medical Center, Cincinnati, Ohio

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Address correspondence to Jeffrey B. Anderson, MD, MPH, MBA, Department of Cardiology, Cincinnati Children's Hospital Medical Center, 3333 Burnet Ave, MLB 2003, Cincinnati, OH 45229. E-mail: jeffrey.anderson@cchmc.org

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subjects. Orthostatic heart rates were observed and showed heart rate increases in both groups, with a significantly greater heart rate increase in VVS than control groups ($P < .001$). An increase in >40 bpm in heart rate by 5 to 10 minutes before syncope with HUT occurred with VVS patients, but not in control patients. It was concluded that VVS patients experience large increases in heart rates during HUT testing and that, therefore, this finding alone should not be used to make the diagnosis of POTS.

A diagnosis of POTS can come with significant psychological effects and should not be taken lightly. As a result, it is imperative for the practitioner to accurately and thoughtfully approach the workup of a patient who may have POTS. Because there is often overlap in some of the symptoms in patients presenting with VVS and POTS, care should especially be taken in differentiating between these 2 entities, primarily by using a comprehensive history as the diagnostic tool. We agree with Medow and colleagues¹⁰ in voicing caution toward using results of HUT testing if this test is used in the

diagnostic workup to differentiate between POTS and VVS. POTS and VVS are clinical diagnoses that should not be made based on the results of HUT testing or even orthostatic vital signs alone. Proper diagnoses will ultimately lead to appropriate management and counseling and positive outcomes for these patients.

ABBREVIATIONS

HUT: head-up tilt

POTS: postural orthostatic tachycardia syndrome

VVS: vasovagal syncope

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