UNDERSTANDING and MANAGING POSTURAL TACHYCARDIA SYNDROME (POTS)

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DEFINITION
- Considered a form of dyssautonomia syndrome
- Characterized by orthostatic intolerance associated with the presence of excessive tachycardia
- Impacts 1 – 3 million Americans
- Affects primarily women, 5:1, ages 15 – 50 y.o.
- Symptoms can be mild, but 25% are unable to work

CLINICAL FINDINGS
- Brain fog, lightheadedness/dizziness, headaches
- Pre-syncope or syncope
- Orthostatic tachycardia increased standing HR~30 bpm or over 120 bpm within 10 min
- Nausea, delayed gastric emptying
- Fatigue, tremulousness Exercise intolerance
- Symptoms worse in morning
- Venous pooling

CLASSIFICATIONS
- Partial dyssautonomia/neuropathic POTS
  - Most common form of POTS
  - Peripheral autonomic neuropathy of the lower extremity characterized by inability to maintain adequate vascular resistance
- Hypervadrenergic POTS
  - Occurs in 10% of POTS
  - Excessive sympathetic discharge resulting in high levels of norepinephrine

DIAGNOSIS
Diagnostic criteria:
- A sustained increase heart rate >30 bpm or over 120 bpm within 10 minutes of standing
- Tachycardia is accompanied by symptoms of cerebral hypoperfusion and autonomic overactivity, relieved by recumbency
- Absence of orthostatic hypotension, in hypervadrenergic POTS, hypertension can occur
- Symptomatic for over 3 months

Diagnostic Tests:
- Orthostatic HR and BP, Active Standing Test
- Tilt Table Test (TTT)
- Catecholamine bloodwork during TTT to determine if hypervadrenergic – norepinephrine >600
- ECG to rule out arrhythmias
- Echocardiogram – to evaluate cardiac structural integrity
- Bloodwork to rule out other causes – CBC, CMP, TSH
- Thermoregulatory sweat test
- 24 hour urine for catecholamines – to rule out pheochromocytoma or sodium level (usually low in POTS)

MANAGEMENT
Non-Pharmacologic Treatments
- Fluids – 2-4 L daily
- Sodium – 4 – 10 g daily

Pharmacologic Treatments:
- Fluidcortisone – augments fluid volume
- Midodrine – vasoconstrictor
- B-blocker – low dose, to control tachycardia, hypervadrenergic POTS
- Ivabradine
- DDAVP (Desmopressin) – fluid retention
- SSRI (norepinephrine inhibitor) – heart rate
- Mestinon (pyridostigmine) – increase neyral transmission
- Alpha adrenergic blocker (sympatholytic) – used only in hypervadrenergic POTS - clonidine, methylidopa
- IV fluid infusion – 0.9% normal saline – fluid replacement
- Erythropoietin – increase volume, vasoconstriction

COLLABORATIVE MODEL IN MANAGING POTS PATIENTS
- Initial diagnosis
- 1 hour consult with physician
- Initial testing, orthostatic HR and BP
- Tilt table test
- Medications

Follow up
- Usually done by Nurse Practitioner
- Review test results – TTT and bloodwork
- Comprehensive review of non-pharmacologic management
- Review of exercise protocol including target heart rate calculations
- Medication initiation or adjustments

COLLABORATION IN RESEARCH
Development of Ivabradine Study for POTS
- Protocol development
- Development of POTS symptom scale
- 20 questions of most common POTS symptom – severity rating
- Use of SF 36 Quality of Life Tool
  - evaluates general health, physical health, activity tolerance, emotional health, pain, energy and emotions, social activity

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REFERENCES
Busner, L. (January 2012). Diagnosis and Management of POTS. Nursing Standard.