



Autonomic Dysfunction

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Or should I say.....

Orthostatic Intolerance Syndromes



Orthostatic Intolerance Syndromes

- Orthostatic/ Postural Hypotension
- Reflex Syncope
- Postural Tachycardia Syndrome
- Inappropriate Sinus Tachycardia



Definition: Orthostatic Hypotension

- Orthostatic/postural hypotension
- Excessive fall in BP occurring on postural change when orthostatic stress overwhelms autonomic defences
- A decline of $>20\text{mmHg}$ in systolic or $>10\text{mmHg}$ in diastolic BP after 3 minutes standing
- Compensatory heart rate increase
- Initial orthostatic hypotension - a transient drop of systolic BP by 40mmHg /diastolic BP 20mmHg within 15 seconds of changing position from supine to upright



Definition: Reflex Syncope

- Other names – neurally mediated syncope/neurocardiogenic syncope
- Types – vasovagal, situational syncope, carotid sinus syncope/hypersensitivity
- Vasovagal - Body overreacts to certain triggers- eg venepuncture, extreme emotional stress, prolonged standing
- Situational – cough, swallow, laugh
- Carotid sinus- head turning, tight fitting collar, hypersensitive carotid baroreceptor reflexes
- Nucleus tractus in the brainstem is activated by the trigger causing overstimulation of the parasympathetic nervous system and withdrawal of sympathetic nervous system
- Cardio-inhibitor response- drop in HR, leading to decrease in BP (rare)
- Vasodepressor response – drop in BP without much change in heart rate
- Majority have a mixed response



Definition:

Postural Tachycardia Syndrome

- Heart rate increases by 30 beats per minute or more, on standing, and is sustained, within 10 minutes in the absence of orthostatic hypotension
- Symptom reproduction
- Symptoms 3-6 months



Definitions: Inappropriate Sinus Tachycardia

- Sinus heart rate higher than 100bpm at rest, or a mean heart rate 90-95 bpm, associated with symptoms with no obvious cause



Sheffield Syncope Service

Reflex Syncope	31%
Orthostatic Intolerance	31%
Drug Induced OH	15 %
Unknown	6%
PoTS	5%
Cardiac Syncope	4%
Drugs/alcohol	3%
NESD/functional	2%
Cough syncope	1%
Audio-vestibular	1%
Sleep apnoea	1%



The History

- Ruling out /consideration of any other causes of symptoms of orthostatic intolerance
- Ruling out cardiac /neurological cause of T-LoC



The History

- Syncope/presyncope/dizziness:
- Consider medications e.g. Mirtazipine/Tamsulosin.
- Adrenal insufficiency,
- Parkinson's/ MSA,
- Diabetic neuropathy,
- Vitamin B12 deficiency,
- Anaemia,
- Low BMI/eating disorders



The History

Increased heart rate on standing can be caused by many conditions and other causes always need to be excluded before a diagnosis is made.

- Deconditioning
- Adrenal insufficiency
- Anaemia
- Thyroid dysfunction
- Medications eg Amytriptilline
- Anxiety/ mental health issues
- Low BMI/eating disorders



Deconditioning

- Inactivity and bed rest are unnatural states of the human body
- Results in reduced functional capacity of multiple body systems
- Causes numerous physiological adaptations in all organ systems often with negative consequences
- Cardiovascular changes within 24 hrs of bed rest
- Increase in heart rate
- Decrease blood volume- 5% in 24 Hrs, 10% in 6 Days,
- Decreased stroke volume, atrophy of myocardium, decreased max O₂ consumption
- Fluid shifts
- Orthostatic hypotension
- Increased risk of clot formation



Symptoms

- Transient Loss of Consciousness- T-LOC/presyncope
- Prodrome- dizzy, lightheaded, sweaty, hot, visual/auditory disturbances, pale
- Posture- prolonged standing/initial stand (prolonged sitting)
- Provoking factors- pain/medical procedure/emotional stress
- Length T-LoC short- seconds to minutes
- Recovery – often left tired, drained afterwards
- OH-chronic problem
- Reflex syncope – episodic
- NESD- frequent, prolonged episodes T-LOC with eye flickering, often occurs in all postures including lying



Symptoms

- Feeling faint/ dizziness/ light-headedness
 - Palpitations
 - Difficulty in breathing/ feeling out of breath
 - Chest discomfort
-
- OH- dizzy/lightheaded/palpitations
 - PoTS / IST- lightheaded/palpitations/
SOB/chest pain + other signs of orthostatic
stress



Other Symptoms

Autonomic dysfunction can cause problems with:

- Sleep
- Fatigue
- Temperature regulation/sweating
- Bowels
- Bladder

Associated conditions:

- Joint hypermobility spectrum disorder/hEDS
- Mast cell activation syndrome



Tests

Aim for objective evidence to support treatment and management

- Tilt table test / active stand test
- Holter monitoring
- Echocardiogram
- ECG
- 24 hr blood pressure monitoring
- Bloods tests – U&E, LFT, TFT, haematimics, vitamin D
- Early morning cortisol
- 24 hr urine tests



Management

- Fluids 2.5-3 litres clear fluid a day
- Salt- at least a teaspoon a day
- Aiming 6-10grams daily
- Slow sodium tablets can be very corrosive to the gut always try dietary salt first
- Test with 24 hr urine for urinary sodium (aim for $>170\text{mmol/L}$)



Other Non Pharmacological Treatments

- Compression tights
- Counter-maneuvres
- Psychological support
- Activity
- Referral to other specialities



Medications

Postural tachycardia/symptomatic sinus tachycardia

- Ivabradine – 2.5mg qds every 4 hrs
- Propranolol 10-20mg tds

Orthostatic hypotension

- Fludrocortisone 50-200mcg od – regular U&E checks
- Midodrine 2.5mg- 10mg every 3-4hrs x3-5 doses a day.
Remember the timing is everything!

Advise on preconception, pregnancy and breast feeding