



Treatment of Orthostatic Intolerance

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Background

Disorders of Orthostatic Intolerance

- Orthostatic hypotension
- Neurally mediated syncope
- Postural tachycardia syndrome

Freeman et al. Consensus Statement. on the Definition of Orthostatic Hypotension, Neurally Mediated Syncope and the Postural Tachycardia Syndrome
Autonomic Neuroscience – Basic and Clinical 2011;161:46-8.

Background

Orthostatic Hypotension – the Variants

- Initial orthostatic hypotension
- Orthostatic hypotension
- Delayed orthostatic hypotension

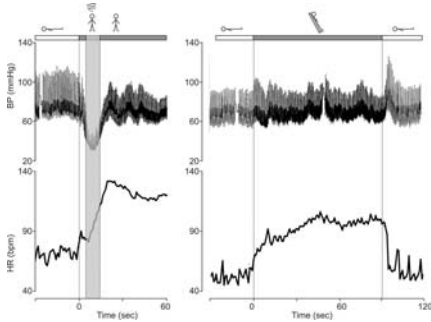
Freeman et al. Consensus Statement. on the Definition of Orthostatic Hypotension, Neurally Mediated Syncope and the Postural Tachycardia Syndrome
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Initial orthostatic hypotension

- Exaggerated transient fall in blood pressure may occur shortly upon standing
- Accompanied by symptoms of hypoperfusion
- Transient – measured with beat-to-beat blood pressure instrument
- Blood pressure decrease (>40 mmHg SBP and/or >20 mmHg DBP) within 15 s of standing
- Occurs in both old and young subjects
- Pathophysiology - a transient mismatch between cardiac output and peripheral vascular resistance that occurs with rapid postural change

Wieling et al Clinical Science, 2007, 112: 157-165

Initial orthostatic hypotension



Wouter Wieling et al. Clin. Sci. 2007;112:157-165

Orthostatic hypotension

- A sustained reduction of SBP of at least 20 mmHg or DBP of 10 mmHg
- Within 3 minutes of standing or head-up tilt to at least 60° on a tilt table.
- A clinical sign - may be symptomatic or asymptomatic.
- In patients with supine hypertension, a reduction in SBP of 30 mmHg may be a more appropriate criterion for orthostatic hypotension - the magnitude of the orthostatic BP fall is dependent on the baseline BP

Freeman R. Neurogenic Orthostatic Hypotension
N Engl J Med 2008;358:615-624

Orthostatic hypotension

- Decrease in systolic blood pressure of 20 mmHg or diastolic blood pressure of 10 mmHg or more
- Accompanied by symptoms of orthostatic intolerance
- Within 3 minutes of standing or upright tilt

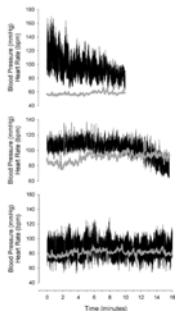
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Delayed orthostatic hypotension

- Orthostatic hypotension that occurs beyond three minutes of standing
- May be a mild or early form of sympathetic adrenergic failure
- Revealed in patients with suspected orthostatic hypotension by extending the period of orthostatic stress (head-up tilt or stand) beyond 3 minutes

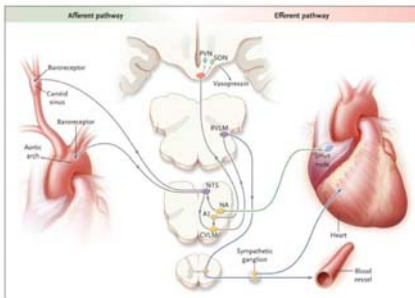
Gibbons, C and Freeman, R. Delayed orthostatic hypotension – A frequent cause of orthostatic intolerance Neurology 2006; 67:28-32

OH and DOH



Autonomic response to orthostatic change

- Blood pooling in dependent areas
- Baroreceptor mediated reflex response
 - Vasomotor
 - Cardiac
 - Endocrine
- SBP ↓5-10mmHg and DBP ↑ 5-10mmHg
- HR ↑10 - 20 bpm



Freeman R. Neurogenic Orthostatic Hypotension
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Symptoms of orthostatic hypotension

- Lightheadedness and dizziness
- Weakness and fatigue
- Headache and neck pain
- Dyspnea
- Leg buckling and limb jerking
- Visual blurring
- Cognitive slowing

Treatment

Orthostatic hypotension

- Impaired vasoconstriction
- Reduced central blood volume
 - Plasma volume
 - Red cell mass

Treatment Overview

- Non-pharmacological
 - Education
 - Prevention
- Pharmacological
 - Increase central blood volume
 - Enhance vasoconstriction

**NON-PHARMACOLOGICAL
TREATMENT**

- Gradual staged movements
- Straining and isometric exercise
- Increase sodium intake
- Warm environments and hot baths
- Hypotensive medications

**NON-PHARMACOLOGICAL
TREATMENT**

- Circadian variation in symptoms
- Raise head of the bed 10-20 degrees
 - Renin-angiotensin activation
 - Decreases nocturnal diuresis
- Custom fitted elastic stockings
- Compensatory physical manoeuvres

TREATMENT OVERVIEW

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Summary

- First Line Agents
 - Mineralocorticoid
 - Alpha-1 adrenoreceptor agonists
 - Direct
 - Indirect
 - Mixed

Summary

- Second Line Agents
 - Droxidopa
 - Pyridostigmine
 - Vasopressin Analogue

Summary

- Third Line Agents
 - NSAIDs
 - Caffeine
 - Erythropoietin
 - β adrenoreceptor antagonists
 - Dihydroergotamine
 - MAOI with tyramine
 - α 2-adrenoreceptor agonists
 - α 2-adrenoreceptor antagonists
 - Somatostatin analogue
