

The Autonomic Profile in Postural Orthostatic Tachycardia Syndrome, about 12 Patients

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Abstract

The postural orthostatic tachycardia syndrome is one of the most common autonomic dysfunctions. Although its clinical presentation may be misleading for the practitioner, it can be easily identified using autonomic tests. Our study included 12 patients with postural orthostatic tachycardia syndrome. Autonomic tests were performed to all those patients. The tests included orthostatic test, echo stress, deep breathing, and hand grip. All subjects had increased central and peripheral beta-adrenergic activity. Alpha adrenergic activity was within normal range.

Keywords: Postural; Orthostatic; Tachycardia; Syndrome; Autonomic; Profile

Introduction

The postural orthostatic tachycardia syndrome (POTS) is a common autonomic disease, initially described in 1983 [1]. It can be defined as an orthostatic intolerance associated with an excessive tachycardia without orthostatic hypotension which may reduce patient's functional capacity and impact their quality of life. POTS should be distinguished from isolated orthostatic intolerance, which is a common term including several manifestations due to standing position not fulfilling POTS criteria [2]. This syndrome is a new entity not well known by cardiologists often mistook for other causes of palpitations. It can be easily diagnosed using autonomic tests. The aim of our study is to describe the autonomic profile in POTS.

Table 1: Patients age.

	Age (Year old)
N	12
Mean	22.7
Standard deviation	4.44
Minimum	15
Maximum	28

Table 3: Autonomic tests results.

	HR raise in OT (bpm)	Vagal activity in HG (%)	Vagal activity in DB (%)	Central alpha-adrenergic activity (%)	Peripheral alpha-adrenergic activity (%)	Central Beta-adrenergic activity (%)
N	12	12	12	12	12	12
Mean	44.9	30.8	57.1	12.3	13.9	28.5
Minimum	30	7	10	2	4	15
Maximum	74	83	96	31	30	81

Material and Methods

This is a retrospective study including 12 patients with POTS conducted at the Cardiology A department of Ibn Sina hospital. The autonomic testing included Orthostatic Test (OT) for peripheral beta-adrenergic activity, Echo Stress (ES) for central alpha- and beta-adrenergic activity, Deep Breathing (DB) for vagal activity and Hand Grip (HG) for both vagal activity and peripheral alpha adrenergic activity assessment. The alpha-adrenergic activity is assessed through blood pressure variability whereas beta adrenergic activity is assessed through heart rate variability.

Results

Table 2: Patient's sex.

Sex	Counts	% of Total
Female	8	66.7%
Male	4	33.3%

Discussion

POTS is one of the most common autonomic diseases. It can be defined as a clinical syndrome lasting at least 6 months that is characterized by an increase in heart rate (HR) ≥ 30 beats per minute (bpm) within 5 to 10 minutes of orthostatism (or ≥ 40 bpm in patients 12 to 19 years of age), the absence of orthostatic hypotension (>20 mm Hg decrease in systolic blood pressure) and frequent symptoms that occur with standing such as palpitations, lightheadedness, tremulousness, generalized weakness, blurred vision, exercise intolerance, and fatigue [3]. Several subtypes of POTS were described: neuropathic, primary hyperadrenergic, hypovolemic, joint-hypermobility-related, and immune-related [4].

POTS predominates in women with a sex ratio of 4-5: 1 [5]. It usually afflicts young people between 13- to 50-year-old [6]. The POTS typical autonomic profile includes increased beta-adrenergic activity and normal alpha-adrenergic activity. An alpha-adrenergic hyperactivity may be encountered in case of adrenergic receptors dysfunction [7]. Vagal hyperactivity and POTS overlap is possible [8]. In that case, the identification of the autonomic disorder responsible for the symptoms can be difficult [8].

In our study, 66.7% of the subjects were young females. All patients have increased central (normal range $\approx 10\%$) and peripheral beta-adrenergic activity whereas alpha adrenergic activity was within normal range ($\approx 10\%$). 10 of 12 had also a vagal hyperactivity on DB (normal range 30 to 50%).

Conclusion

POTS is a common autonomic disorder. Its typical presentation is a young woman with lightheadedness and palpitations oc-

curing in upright position, an increase in HR ≥ 30 bpm within 5 to 10 minutes of orthostatism and a normal alpha-adrenergic activity. An overlap with vagal hyperactivity can be observed.

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Compliance with ethical standards.

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