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**SÍNCOPE VASOVAGAL E SÍNDROME DE TAQUICARDIA POSTURAL
ORTOSTÁTICA (POTS) EM ADULTOS JOVENS: UMA REVISÃO INTEGRATIVA
DA LITERATURA
VASOVAGAL SYNCOPE AND POSTURAL ORTHOSTATIC TACHYCARDIA
SYNDROME (POTS) IN YOUNG ADULTS: AN INTEGRATIVE LITERATURE
REVIEW**

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RESUMO

A síncope vasovagal e a síndrome de taquicardia postural ortostática são condições associadas à regulação autonômica cardiovascular que acometem frequentemente adolescentes e adultos jovens. Apesar de apresentarem mecanismos fisiopatológicos distintos, ambas podem manifestar sintomas semelhantes, como tontura, palpitações, fraqueza, intolerância ao exercício, pré-síncope e sintomas desencadeados pela permanência prolongada em posição ortostática, o que pode dificultar sua diferenciação clínica. Este estudo tem como objetivo comparar a síncope vasovagal e a síndrome de taquicardia postural ortostática em adultos jovens, com ênfase em seus mecanismos fisiopatológicos, manifestações clínicas, critérios diagnósticos e desafios relacionados ao diagnóstico diferencial. Foi realizada uma revisão integrativa da literatura, utilizando artigos científicos indexados na base PubMed/MEDLINE, priorizando estudos relacionados à disfunção autonômica, intolerância ortostática e avaliação diagnóstica. Os achados indicam que a síndrome de taquicardia postural ortostática é caracterizada por aumento excessivo e sustentado da frequência cardíaca após assumir a posição ortostática, sem hipotensão ortostática significativa, enquanto a síncope vasovagal geralmente envolve uma resposta cardiovascular reflexa que resulta em hipotensão, com ou sem bradicardia, podendo levar à perda transitória da consciência. Embora as manifestações clínicas possam se sobrepor, a avaliação cuidadosa do padrão dos sintomas e das respostas cardiovasculares ao estresse ortostático pode auxiliar na diferenciação dessas condições. Portanto, compreender suas diferenças fisiopatológicas e clínicas é essencial para melhorar a precisão diagnóstica, evitar classificações inadequadas e orientar o manejo clínico apropriado em adultos jovens. Palavras-chave: Síncope Vasovagal. Síndrome de Taquicardia Postural Ortostática. Intolerância Ortostática. Sistema Nervoso Autônomo. Adulto Jovem.

ABSTRACT

Vasovagal syncope and postural orthostatic tachycardia syndrome are disorders associated with autonomic cardiovascular regulation that commonly affect adolescents and young adults. Despite their distinct pathophysiological mechanisms, both conditions may present with similar symptoms, including dizziness, palpitations, weakness, exercise intolerance, presyncope, and symptoms triggered by prolonged standing, which may complicate their clinical differentiation. This study aims to compare vasovagal syncope and postural orthostatic tachycardia syndrome in young adults, with emphasis on their pathophysiological mechanisms, clinical manifestations, diagnostic criteria, and challenges involved in differential diagnosis. An integrative literature review was conducted using scientific articles indexed in the PubMed/MEDLINE database, prioritizing studies addressing autonomic dysfunction, orthostatic intolerance, and diagnostic assessment. The findings indicate that postural orthostatic tachycardia syndrome is characterized by an excessive and sustained increase in heart rate after assuming an upright position, without significant orthostatic hypotension, whereas vasovagal syncope typically involves a reflex cardiovascular response that results in hypotension, with or without bradycardia, and may lead to transient loss of consciousness. Although clinical manifestations may overlap, careful evaluation of symptom patterns and cardiovascular responses to orthostatic stress can assist in distinguishing these conditions. Therefore, understanding their pathophysiological and clinical differences is essential for improving diagnostic accuracy, avoiding misclassification, and guiding appropriate clinical management in young adults.

Keywords: Vasovagal Syncope. Postural Orthostatic Tachycardia Syndrome. Orthostatic Intolerance. Autonomic Nervous System. Young Adult.

INTRODUÇÃO

Syncope is a transient loss of consciousness caused by temporary cerebral hypoperfusion, characterized by rapid onset, short duration, and spontaneous complete recovery. Vasovagal syncope (VVS), the most common form, frequently affects young individuals and recurrent episodes may impair quality of life and cause injuries.¹ Postural orthostatic tachycardia syndrome (POTS) is characterized by a sustained and excessive increase in heart rate after assuming an upright position, without significant orthostatic hypotension.² It predominantly affects adolescents and young adults and may interfere with education, work, physical activity, and social functioning.³

VVS and POTS share manifestations such as dizziness, palpitations, weakness, exercise intolerance, presyncope, and symptoms triggered by prolonged standing, but differ in their hemodynamic patterns. VVS typically involves a reflex response leading to hypotension, with or without bradycardia, whereas POTS is characterized by persistent orthostatic tachycardia without significant orthostatic hypotension.^{2,4} POTS has a heterogeneous pathophysiology involving impaired peripheral vasoconstriction, sympathetic activation, blood volume dysregulation, and cardiovascular deconditioning.⁵ Differentiation may be challenging because substantial tachycardia can also precede hypotension in VVS.^{6,7} Thus, clinical history, symptom pattern, blood pressure behavior, and the temporal sequence of cardiovascular responses should be considered.^{2,6} Diagnostic uncertainty remains clinically relevant in young adults, in whom recurrent orthostatic symptoms may impair daily activities and quality of life.^{1,3,9}

Therefore, this study aims to compare vasovagal syncope and postural orthostatic tachycardia syndrome in young adults, emphasizing their pathophysiological mechanisms, clinical manifestations, diagnostic criteria, and the main challenges involved in their differential diagnosis.

MÉTODO

This integrative literature review compared VVS and POTS in young adults regarding pathophysiology, clinical manifestations, diagnostic criteria, and differential diagnosis. The

guiding question was: “What are the main pathophysiological, clinical, and diagnostic differences between VVS and POTS in young adults?” The literature search was conducted in August 2026 using PubMed/MEDLINE. The terms “Vasovagal Syncope,” “Postural Orthostatic Tachycardia Syndrome,” “POTS,” “Orthostatic Intolerance,” “Autonomic Nervous System,” “Young Adult,” “Pathophysiology,” “Diagnosis,” and “Differential Diagnosis” were combined using AND and OR. English-language clinical studies, reviews, consensus statements, and guidelines addressing VVS and/or POTS were eligible, prioritizing young adults and including adolescents when relevant. No strict publication-year restriction was applied, although recent studies were prioritized. Duplicates, studies unrelated to the guiding question, those exclusively addressing other causes of syncope or orthostatic intolerance, and publications without relevant clinical, pathophysiological, or diagnostic information were excluded. Titles and abstracts were screened, followed by full-text assessment. Relevant findings were synthesized into four thematic categories: pathophysiology, clinical manifestations, diagnostic characteristics, and differential diagnosis.

RESULTADOS

The selected studies demonstrated clinical overlap between VVS and POTS but important differences in pathophysiology, symptom patterns, and hemodynamic responses. Findings were organized into four thematic categories.

Pathophysiological findings

VVS involves an inappropriate cardiovascular reflex leading to peripheral vasodilation, reduced cardiac output, hypotension, and transient cerebral hypoperfusion, sometimes accompanied by decreased heart rate.^{1,4} In contrast, POTS is a heterogeneous disorder associated with partial autonomic neuropathy, sympathetic activation, hypovolemia, impaired peripheral vasoconstriction, cardiovascular deconditioning, and possible immune-mediated mechanisms.^{2,3,5} Despite this heterogeneity, excessive and sustained heart rate increase during upright posture is a common physiological feature.²

Clinical manifestations

Considerable clinical overlap was identified between VVS and POTS, including dizziness, palpitations, weakness, blurred vision, fatigue, exercise intolerance, nausea, and presyncope during prolonged standing.^{2,7} POTS generally causes chronic and recurrent orthostatic symptoms that worsen upright and improve with recumbence, whereas VVS is predominantly episodic and may progress from prodromal warmth, nausea, sweating, pallor, and visual

disturbances to transient loss of consciousness.^{1,2,3,4} Complete loss of consciousness is not required for POTS and is not its predominant manifestation.⁷

Diagnostic characteristics

POTS is characterized in adults by a sustained heart rate increase of at least 30 beats per minute within 10 minutes of standing or head-up tilt, without significant orthostatic hypotension and with chronic orthostatic symptoms.^{2,3} In adolescents, a threshold of 40 beats per minute is generally applied.² VVS does not depend on a specific heart rate increase; clinical history, characteristic triggers, prodromes, and spontaneous recovery are important, and tilt-table testing may reproduce a delayed abrupt fall in blood pressure, sometimes with bradycardia.^{4,7}

In young patients with recurrent VVS undergoing head-up tilt testing, the mean maximum heart rate increase was 39.8 beats per minute versus 20.3 in controls; 26% reached an increase of at least 40 beats per minute within five minutes and 44% within ten minutes or before fainting.⁶ Thus, marked postural tachycardia may also occur in VVS and should not alone be interpreted as evidence of POTS.

Differential diagnosis

The main distinction is the pattern and timing of the hemodynamic response to orthostatic stress. In POTS, tachycardia occurs early after assuming an upright position and remains sustained, with relatively preserved blood pressure. In VVS, substantial tachycardia may initially occur, followed by an abrupt decrease in blood pressure and sometimes heart rate, potentially resulting in syncope.^{6,7} Therefore, heart rate increase alone is insufficient for differentiation; symptom chronicity, occurrence of syncope, blood pressure behavior, and the temporal sequence of cardiovascular changes should also be considered.^{2,6,7} The main differences are summarized in Table 1.

Table 1 - Main clinical, pathophysiological, and diagnostic differences between vasovagal syncope and postural orthostatic tachycardia syndrome

Characteristic	Vasovagal Syncope (VVS)	Postural Orthostatic Tachycardia Syndrome (POTS)
Clinical pattern	Predominantly episodic	Chronic orthostatic intolerance
Main hemodynamic alteration	Delayed hypotension, with or without bradycardia	Early and sustained orthostatic tachycardia
Blood pressure	Marked decrease during the vasovagal episode	Generally preserved without significant orthostatic hypotension
Heart rate	May initially increase, followed by reduction in some episodes	Sustained increase ≥ 30 bpm in adults within 10 minutes of standing
Loss of consciousness	Characteristic of complete syncopal	Not required and generally less

	episodes	characteristic
Common symptoms	Dizziness, nausea, sweating, warmth, visual changes, presyncope	Dizziness, palpitations, fatigue, weakness, exercise intolerance, presyncope
Symptom behavior	Episodes associated with specific triggers and followed by spontaneous recovery	Symptoms worsen with upright posture and improve with recumbence
Main diagnostic elements	Clinical history, triggers, prodromes and, when indicated, tilt-table testing	Orthostatic vital signs or tilt testing combined with chronic orthostatic symptoms
Pathophysiology	Reflex cardiovascular response causing cerebral hypoperfusion	Heterogeneous autonomic dysfunction involving multiple potential mechanisms

Source: Prepared by the authors based on references 2, 3, 6, and 7.

CONCLUSÃO

The evidence reviewed shows that VVS and POTS share symptoms of orthostatic intolerance but differ in their pathophysiology and hemodynamic responses. POTS is characterized by sustained orthostatic tachycardia without significant orthostatic hypotension, whereas VVS involves delayed hypotension, with or without bradycardia, and may cause transient loss of consciousness. Since marked tachycardia may also occur in VVS, differentiation should integrate clinical history, symptom pattern, blood pressure behavior, and the temporal sequence of cardiovascular responses.

Recognizing these differences may improve diagnostic accuracy and guide management in young adults. Clinical history, orthostatic vital signs, and, when indicated, tilt-table testing remain important. Future studies should investigate specific diagnostic markers, standardized assessment protocols, and mechanisms underlying the overlap between these disorders.

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