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PREVENTION OF NEUROCIRCULATORY DYSTONIA IN ADOLESCENTS

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Abstract: Neurocirculatory dystonia (NCD) is a functional disorder of the cardiovascular system characterized by autonomic imbalance, often observed during adolescence due to hormonal changes, psychosocial stress, and increased academic load. This article aims to analyze the risk factors, preventive strategies, and medical-social importance of NCD in adolescents. Emphasis is placed on lifestyle modification, psychosocial support, and early medical intervention as key preventive measures.

Keywords: neurocirculatory dystonia, adolescence, prevention, autonomic dysfunction, cardiovascular system.

Introduction

Neurocirculatory dystonia (NCD), also referred to as autonomic dysfunction syndrome, represents a common condition during adolescence, when physiological growth, hormonal fluctuations, and psychological stressors interact with the autonomic nervous system. Adolescents are particularly vulnerable due to the transition from childhood to adulthood, which is accompanied by emotional instability, increased physical demands, and academic pressure. The prevalence of NCD among adolescents is estimated at 10–25% depending on diagnostic criteria, with a higher incidence in females. Although not life-threatening, NCD significantly impairs quality of life, increases school absenteeism, and may predispose individuals to future cardiovascular disorders. Therefore, preventive strategies are crucial for maintaining health and psychosocial well-being during this sensitive period.

Adolescence represents a particularly vulnerable stage in human development. During this period, rapid somatic growth, endocrine changes associated with puberty, and social adaptation demands place an additional burden on the cardiovascular and nervous systems. Hormonal fluctuations, particularly in estrogen and androgen levels, influence vascular tone and autonomic reactivity. Moreover, the increasing academic load, exposure to digital devices, sleep deprivation, and psycho-emotional stress contribute to the dysregulation of autonomic responses. Studies suggest that up to one in four adolescents may exhibit symptoms consistent with NCD, with a higher frequency observed in females due to hormonal sensitivity and psychosocial stress factors.

The significance of NCD extends beyond transient discomfort. Persistent autonomic imbalance in adolescence can increase the risk of anxiety disorders, depression, and psychosomatic illnesses. Furthermore, in some individuals, autonomic dysfunction may serve as a predisposing factor for the development of hypertension, ischemic heart disease, and other cardiovascular conditions in adulthood. Hence, adolescence offers a critical window of opportunity for prevention, as timely interventions can prevent long-term health consequences.

Despite the relatively high prevalence of NCD, awareness among adolescents, parents, and educators remains limited. Symptoms are often misinterpreted as manifestations of stress, laziness, or poor discipline, leading to underdiagnosis and delayed intervention. This highlights

the importance of structured prevention programs that combine lifestyle education, stress management, physical activity promotion, and regular medical check-ups.

The present article focuses on prevention as a strategic approach to reducing the incidence and severity of NCD among adolescents. By reviewing existing literature and summarizing the most effective preventive measures, the study aims to provide practical recommendations for healthcare providers, schools, and families. Emphasis is placed on lifestyle modification, psychosocial support, and systematic health monitoring as the cornerstones of preventive care.\

Methods

This study is based on a comprehensive review of literature published in PubMed, Scopus, and regional medical journals between 2010 and 2025. Key search terms included “neurocirculatory dystonia,” “adolescents,” “prevention,” and “autonomic dysfunction.” The review focused on epidemiological studies, clinical trials, and preventive health guidelines. Preventive measures were categorized into primary (general health promotion), secondary (early detection and treatment), and tertiary (preventing progression of symptoms).

Results

Analysis of the literature revealed that preventive strategies for NCD in adolescents are most effective when combining lifestyle, medical, and psychosocial interventions. Regular aerobic exercise improves autonomic balance and cardiovascular fitness. A balanced diet rich in vitamins and minerals reduces fatigue and stabilizes blood pressure. Adequate sleep (8–9 hours per night) is associated with a lower risk of autonomic imbalance. Stress management programs and counseling reduce the incidence of psychosomatic complaints. School-based health education improves awareness and coping strategies among adolescents. Regular clinical examinations help in early detection of cardiovascular irregularities. Non-pharmacological therapies such as physiotherapy, breathing exercises, and relaxation techniques are effective in reducing symptoms. Pharmacological intervention (sedatives, adaptogens, or mild beta-blockers) is rarely required and considered only in severe cases.

Discussion

The findings emphasize that preventive strategies for NCD should prioritize non-pharmacological approaches. The adolescent period is critical for establishing lifelong health behaviors; thus, prevention must address both physiological and psychological needs. School-based programs play a central role in the early detection of NCD and in promoting healthy habits. Family involvement is also essential, as adolescents with strong parental support demonstrate lower stress levels and reduced symptoms of autonomic dysfunction. While pharmacological treatment may provide temporary relief, reliance on medication should be minimized due to the risk of side effects and psychological dependency. Preventive strategies should therefore integrate lifestyle, psychosocial, and medical aspects in a holistic manner.

Conclusion

Neurocirculatory dystonia is a prevalent functional disorder among adolescents, strongly influenced by lifestyle, psychosocial factors, and physiological changes during puberty.

Prevention of NCD should be based on health promotion, stress management, and regular medical monitoring. Early preventive measures not only reduce the burden of NCD in adolescence but also contribute to long-term cardiovascular health. Future research should focus on developing standardized preventive programs and implementing them in schools and community health settings.

The prevention of NCD should be regarded as a multidisciplinary task involving physicians, educators, psychologists, parents, and the adolescents themselves. Lifestyle modification—including regular physical exercise, balanced nutrition, and sufficient sleep—represents the foundation of prevention. Equally important are stress management programs, counseling services, and school-based initiatives that help adolescents develop resilience and coping mechanisms. Regular medical check-ups with attention to autonomic symptoms enable early detection and timely intervention, preventing progression of the disorder.

The evidence reviewed in this study strongly suggests that non-pharmacological approaches should remain the mainstay of prevention. Medication may play a limited role in severe or refractory cases, but overreliance on pharmacotherapy should be avoided due to the risk of dependency and side effects. Instead, a holistic approach that integrates physical, psychological, and social dimensions of adolescent health is more effective and sustainable.

In conclusion, prevention of neurocirculatory dystonia in adolescents is not only a medical challenge but also a public health priority. Early, comprehensive preventive measures reduce the immediate burden of symptoms and promote long-term cardiovascular resilience. Future efforts should focus on developing standardized, evidence-based preventive programs that can be implemented in schools and community health settings, thereby ensuring that adolescents grow into healthy adults with reduced risk of cardiovascular and psychosomatic diseases.

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