

Vestibular rehabilitation for children with central vestibular disorders: Challenges and strategies.

Shoan Bervis*

Physical Therapy Department, School of Rehabilitation Sciences, Shiraz University of Medical Sciences, Shiraz, Iran

Introduction

Vestibular disorders in children can significantly impact their quality of life, hindering their ability to perform everyday activities, navigate their environment, and even hinder their social interactions. Central vestibular disorders, stemming from issues within the central nervous system, present unique challenges for children due to the critical role the vestibular system plays in motor development, balance, and spatial awareness. Vestibular rehabilitation offers a promising avenue for addressing these challenges and helping children regain functional independence [1]. However, there are distinct challenges associated with rehabilitating central vestibular disorders in children, and strategies must be carefully crafted to address their specific needs.

Understanding central vestibular disorders in children

Central vestibular disorders in children arise from disruptions in the central nervous system, including the brainstem, cerebellum, and their connections. Conditions like cerebral palsy, developmental delay, and genetic disorders can lead to compromised vestibular function. These disorders manifest as difficulties in maintaining balance, altered gait patterns, and poor coordination [2]. Additionally, children might experience dizziness, nausea, and visual disturbances, impacting their participation in school and recreational activities.

Challenges in vestibular rehabilitation for children

Cognitive and emotional considerations: Children with central vestibular disorders may have cognitive and emotional challenges that affect their engagement in rehabilitation. Patience, attention span, and understanding of instructions can vary widely, making it necessary for therapists to tailor interventions to each child's cognitive abilities [3].

Age-appropriate interventions: Designing rehabilitation strategies that are age-appropriate and engaging for children is essential. Younger children might respond better to play-based interventions, while older children might benefit from activities that align with their interests.

Family involvement: Involving parents and caregivers is crucial for the success of vestibular rehabilitation in children. Educating families about the disorder, exercises, and home-

based activities is vital to maintaining consistency in therapy efforts.

Multidisciplinary collaboration: Children with central vestibular disorders often require a multidisciplinary approach involving physical therapists, occupational therapists, speech therapists, and medical professionals. Collaborative communication among these specialists ensures a comprehensive approach to rehabilitation [4].

Strategies for vestibular rehabilitation

Adaptive exercises: Tailoring exercises to accommodate the child's abilities is essential. Gradually increasing the complexity of exercises can help children build confidence and progress in their rehabilitation journey.

Visual-vestibular integration: Activities that challenge visual-vestibular integration can improve gaze stability and reduce dizziness. Such exercises might involve tracking objects while moving the head or performing tasks on unstable surfaces [5].

Balance training: Incorporating dynamic balance exercises, such as standing on foam surfaces or using balance boards, can enhance proprioception and spatial awareness.

Gaze stabilization exercises: Gaze stabilization exercises can help children maintain visual focus while the head is in motion. These exercises can be modified to suit the child's age and abilities.

Virtual reality and gamification: Utilizing virtual reality and gamification can make rehabilitation engaging for children. Virtual environments can simulate real-world situations while allowing therapists to monitor progress.

Conclusion

Vestibular rehabilitation for children with central vestibular disorders is a complex yet essential undertaking. By understanding the unique challenges they face and tailoring rehabilitation strategies to their needs, physical therapists can significantly impact children's functional abilities and overall quality of life. Collaboration among healthcare professionals, family involvement, and creative interventions are key components in addressing the multifaceted challenges presented by central vestibular disorders in children. Through dedication, innovation, and patient-centered care, children can

*Correspondence to: Shoan Bervis, Physical Therapy Department, School of Rehabilitation Sciences, Shiraz University of Medical Sciences, Shiraz, Iran, E mail: shoan_b@sums.ac.ir

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regain their equilibrium and conquer the challenges posed by central vestibular disorders.

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