Research Progress on the Nursing Application of Neuromuscular Training for Spasmodic Torticollis

Authors:

Date: 2025-11-05T01:49:03+00:00

Abstract

Spasmodic torticollis, as a focal dystonia disorder, severely affects patients' quality of life. This review focuses on the advances in the application of neuromuscular training nursing in spasmodic torticollis. Through comprehensive analysis of relevant studies, it elaborates on the mechanisms of action and actual effects of neuromuscular training nursing in improving muscle function, alleviating pain, correcting posture, and enhancing activities of daily living in patients with spasmodic torticollis. Research indicates that this nursing model demonstrates significant advantages in assisting clinical treatment and promoting patient rehabilitation, providing new insights and directions for the treatment and nursing of spasmodic torticollis.

Full Text

Research Progress on Neuromuscular Training Nursing in Cervical Dystonia

First Affiliated Hospital of Tianjin University of Traditional Chinese Medicine, Tianjin, 300381

Abstract

Cervical dystonia, as a focal dystonia disorder, severely impacts patients' quality of life. This review focuses on the application progress of neuromuscular training nursing in cervical dystonia. Through comprehensive analysis of relevant studies, we elaborate on the mechanisms and practical effects of neuromuscular training nursing in improving muscle function, relieving pain, correcting posture, and enhancing self-care abilities in patients with cervical dystonia. Research demonstrates that this nursing model offers significant advantages in assisting

clinical treatment and promoting patient rehabilitation, providing new insights and directions for the treatment and nursing of cervical dystonia.

Keywords: Cervical dystonia; Neuromuscular training nursing; Rehabilitation progress

Introduction

Cervical dystonia is a disorder characterized by paroxysmal involuntary contractions of neck muscles such as the sternocleidomastoid and trapezius, resulting in twisting or tilting of the head and neck. Its etiology is complex and may involve genetic factors, neurotransmitter imbalances, basal ganglia lesions, and other factors. Traditional treatment modalities include medication, botulinum toxin injections, and surgical interventions, but these approaches often have limitations. Neuromuscular training nursing has emerged as a novel rehabilitation nursing method that has gradually been applied in cervical dystonia treatment. Through specific training protocols, it intervenes in the neuromuscular system to improve muscle function, alleviate muscle spasms, and correct abnormal postures [1]. Numerous studies have preliminarily demonstrated its positive role in cervical dystonia rehabilitation. This article provides a comprehensive review of relevant research progress.

1. Pathogenesis of Cervical Dystonia

The exact pathogenesis of cervical dystonia remains incompletely understood. Current consensus suggests that neuroregulatory dysfunction in the basal ganglia, thalamus, and brainstem plays a crucial role. Neuroimaging studies have revealed structural and functional abnormalities in the basal ganglia of some cervical dystonia patients. He et al. [2] demonstrated differences in volume and signal intensity in the globus pallidus internus and ventral intermediate nucleus of the thalamus compared to healthy individuals. Additionally, genetic factors account for a certain proportion of cases. Familial cervical dystonia typically follows an autosomal dominant inheritance pattern, with multiple pathogenic genes identified, such as the TorsinA gene. Individuals carrying these mutations may experience impaired normal neuronal function, increasing the risk of developing cervical dystonia [].

2. Theoretical Basis of Neuromuscular Training Nursing

Neuromuscular training nursing is grounded in neuroplasticity theory, which posits that the nervous system can undergo structural and functional changes in response to environmental stimuli. Targeted training can promote neural pathway remodeling and functional recovery. In cervical dystonia patients, neck muscles remain in a state of abnormal contraction for prolonged periods, disrupting normal neuromuscular feedback mechanisms [3]. Neuromuscular training nursing reprograms the neuromuscular system through specific exercises,

including neck muscle stretching, relaxation training, and postural control exercises, to restore normal movement patterns. Proprioceptive Neuromuscular Facilitation (PNF) technology also serves as an important theoretical foundation. PNF emphasizes stimulating proprioceptors to promote muscle contraction and relaxation, enhancing muscle coordination and joint range of motion. In cervical dystonia nursing, PNF application can effectively improve proprioception in neck muscles, correct abnormal movement patterns, and enhance muscle control capabilities [4].

3. Specific Methods and Application Research

3.1 Neck Muscle Stretching Training Neck muscle stretching training constitutes a fundamental component of neuromuscular training nursing. Pan et al. [5] reported that chronic muscle spasms lead to shortening and fibrosis of neck muscles, further exacerbating torticollis symptoms. Targeted stretching exercises can lengthen contracted muscles, relieve tension, and improve neck mobility. In a study by Wang et al. [6], cervical dystonia patients were divided into intervention and control groups. The intervention group underwent a 12-week neck muscle stretching program targeting primarily affected muscles including the sternocleidomastoid and trapezius, incorporating both static and dynamic stretching. Results showed significantly improved cervical range of motion in the intervention group compared to controls, along with substantial pain reduction.

3.2 Postural Control Training Postural control training aims to help patients correct abnormal head and neck postures and restore normal body alignment. This approach emphasizes postural awareness in daily life, training patients to maintain proper head and neck positions during sitting, standing, and walking to reduce neck muscle burden and improve mechanical loading. Yu et al. [7] found that after eight weeks of training, patients' abnormal posture scores decreased significantly, with corresponding improvements in quality of life. Researchers utilized postural feedback devices to monitor patients' postural changes in real-time, providing immediate correction and guidance to help patients master proper postural control techniques.

3.3 Breathing Training Breathing is closely related to neck muscle activity, and abnormal breathing patterns may increase neck muscle tension, thereby affecting torticollis symptoms. As a component of neuromuscular training nursing, breathing training involves instructing patients in deep breathing and diaphragmatic breathing exercises to regulate respiratory rhythm and relax neck muscles. Zeng et al. [8] demonstrated that this combined training approach significantly reduced muscle tension in cervical dystonia patients while improving respiratory function and quality of life. Researchers propose that breathing training can indirectly influence neck muscle tone by regulating autonomic nervous system function, thereby alleviating torticollis symptoms.

3.4 Neuromuscular Electrical Stimulation-Assisted Training Neuromuscular Electrical Stimulation (NMES) is a therapeutic modality that uses electrical currents to stimulate nerves and muscles, inducing muscle contraction. When integrated into neuromuscular training nursing, NMES can enhance training effectiveness. Deng et al. [9] reported that NMES promotes muscle blood circulation, improves metabolic levels, and stimulates nerve endings to facilitate neurological recovery. One study combined NMES with neck muscle stretching training in cervical dystonia patients. Results showed that compared to stretching alone, the combined therapy group exhibited more significant improvements in muscle strength and endurance, with better torticollis symptom relief.

3.5 Motor Relearning Training Motor relearning training emphasizes active patient participation and repetitive practice to relearn normal movement patterns. In cervical dystonia treatment, this includes active neck movement training and coordination exercises. Through these interventions, patients gradually regain voluntary control of neck muscles and correct abnormal movement habits. Sun et al. [10] found that after 16 weeks of training, patients' motor function scores improved significantly, with notable enhancements in activities of daily living. Researchers noted that motor relearning training can stimulate patients' intrinsic motivation, promote functional reorganization of the neuromuscular system, and thereby improve rehabilitation outcomes.

4. Effects of Neuromuscular Training Nursing on Patients with Cervical Dystonia

4.1 Muscle Function Improvement Deng et al. [11] demonstrated that neuromuscular training nursing effectively improves muscle function in cervical dystonia patients. Through various training methods including muscle stretching and strengthening exercises, this approach enhances muscle strength, endurance, flexibility, and coordination. In multiple studies mentioned above, patients receiving neuromuscular training nursing showed significant improvements in muscle strength tests and joint range of motion measurements. These findings indicate that neuromuscular training nursing helps restore normal neck muscle function and reduces the impact of muscle spasms on daily life.

4.2 Pain Relief Cervical dystonia patients often experience neck pain that severely affects quality of life. Neuromuscular training nursing alleviates pain through multiple mechanisms. First, stretching and muscle relaxation reduce muscle tension and intramuscular pressure, thereby relieving pain. Second, improved posture and movement patterns decrease abnormal mechanical stress on muscles, preventing pain caused by excessive muscle fatigue. Hua et al. [12] reported that after a period of neuromuscular training nursing, patients' Visual Analogue Scale (VAS) pain scores decreased significantly, indicating effective pain relief.

4.3 Posture Correction A primary objective of neuromuscular training nursing is correcting abnormal posture. Through postural control training and motor relearning exercises, patients learn to maintain proper head and neck positions and improve body alignment. Long-term adherence to training results in significant postural correction, which not only improves appearance but also reduces neck muscle burden and facilitates recovery. Zhang et al. [13] found that patients receiving neuromuscular training nursing showed significant reductions in abnormal posture scores, demonstrating effective postural correction.

4.4 Quality of Life Improvement Through the combined effects of muscle function improvement, pain relief, and posture correction, neuromuscular training nursing ultimately significantly enhances quality of life for cervical dystonia patients. Patients demonstrate increased capacity for daily activities, with improvements in basic self-care skills such as dressing, grooming, and eating. Psychological status also benefits, with enhanced self-confidence and increased social participation. Quality of life assessment scales show significant improvements across multiple domains including physical, psychological, and social function, indicating comprehensive enhancement of quality of life [14].

Conclusion

Neuromuscular training nursing, as an emerging rehabilitation nursing modality, holds significant value in cervical dystonia treatment. By improving muscle function, relieving pain, correcting posture, and enhancing quality of life, it offers new hope for patient recovery. As research continues to deepen and refine, neuromuscular training nursing is expected to play an increasingly important role in the comprehensive management of cervical dystonia.

References

[1] Guo W, Yi YZ, Wang JY, et al. Clinical efficacy of integrated medical-nursing care on children with congenital muscular torticollis and its improvement effect on family self-care knowledge-attitude-practice [J]. International Journal of Nursing Science, 2023, 42(14): 2665-2668.

[2] He M, Wang JJ, Wang SF. Clinical observation of massage plucking manipulation combined with home rehabilitation nursing in the treatment of pediatric congenital muscular torticollis [J]. Clinical Journal of Traditional Chinese Medicine, 2024, 36(8): 1595-1599.

[3] Yang Y. Application effect of narrative nursing in school-age children with congenital muscular torticollis [J]. Chinese Clinical Nursing, 2022, 14(12): 736-738.

[4] Wang WX, Lei W. Massage treatment and nursing of pediatric congenital muscular torticollis [J]. 2021. DOI:10.12332/j.issn.2095-6525.2021.02.203.

[5] Pan YJ. Clinical effect of pediatric massage combined with traditional Chinese medicine nursing on pediatric muscular torticollis [J]. Chinese Science and Technology Journal Database (Full Text Edition) Medicine and Health, 2021(2): 1.

[6] Wang JJ, Li GM, Gu Q, et al. Clinical efficacy of integrated traditional Chinese medicine and nursing intervention in treating pediatric congenital muscular torticollis and its influence on family self-care knowledge-attitude-practice [J]. Journal of Pediatrics of Traditional Chinese Medicine, 2021, 17(3): 5.

[7] Yu YY, Chen YH, Lin Y, et al. Research on the application value of physical factor therapy and rehabilitation nursing in the rehabilitation treatment of muscular torticollis [J]. China Practical Medicine, 2020, 15(6): 3.

[8] Zeng LP, Yi YZ, Ouyang T, et al. Effect of preoperative neck muscle strength training on children with congenital muscular torticollis [J]. International Journal of Nursing Science, 2022, 41(24): 4.

[9] Deng GL, Zhou JD, Li RY. Study on perioperative nursing of pediatric congenital muscular torticollis [J]. 2023(1): 82-84.

[10] Sun YJ. Clinical experience of massage in treating pediatric congenital muscular torticollis [J]. Chinese Science and Technology Journal Database (Full Text Edition) Medicine and Health, 2021(5): 2.

[11] Deng GL, Zhou JD, Li RY. Study on perioperative nursing of pediatric congenital muscular torticollis [J]. Maternal and Child Nursing, 2023(1): 82-84.

[12] Hua S, Wei N, Liu J. Analysis of perioperative nursing in children with congenital muscular torticollis [J]. Health Advice, 2022(3): 132-134.

[13] Zhang J, He J, Zhang L. Summary of best evidence for early screening and management of children with congenital muscular torticollis [J]. Chinese Journal of Modern Nursing, 2024, 30(12): 1643-1647.

[14] Wang JJ, Li GM, Gu Q, et al. Clinical efficacy of integrated traditional Chinese medicine and nursing intervention in treating pediatric congenital muscular torticollis and its influence on family self-care knowledge-attitude-practice [J]. 2021. DOI:10.16840/j.issn1673-4297.2021.03.24.

Note: Figure translations are in progress. See original paper for figures.