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Case Report

Vestibular rehabilitation program for cervical radiculopathy with vertigo

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ABSTRACT

A herniated disc or other space-occupying lesion (typically linked with cervical spondylitis and osteophyte invasion) produces nerve root impingement, inflammation, or both in the cervical spinal nerve root, resulting in cervical radiculopathy. Because a large number of people with cervical radiculopathy may need surgery and are frequently managed by physical therapists, the management of cervical radiculopathy necessitates considerable thought. Since cervical radiculopathy is a well-known disease with a pathos anatomic diagnosis, many clinicians will experience it. However, no diagnostic criteria for cervical radiculopathy have been identified. Existing awareness of cervical radiculopathy cannot provide health practitioners with enough information to assess prognosis, identify risk factors, or choose effective treatments for cervical radiculopathy care. The patient came to the hospital with the complaint of vertigo and numbness and tingling sensation in the upper limb. A primary care physician's prescription for "dizziness, assess and treat" were done. In physiotherapy department further assessment were carried out and then patient was instructed to do some exercise and treatment was given. Despite the fact that cervical radiculopathy is mostly a medical diagnosis, the exact clinical diagnosis of the cervical radiculopathy clinical exam remains unknown. Both technical and practical concerns influence the procedure chosen. Although no predisposition to live or risks have been established, and the efficiency of various non-operative interventions for the condition is unknown, cervical radiculopathy appears to have a mainly positive natural history. To define definitive diagnostic criteria and successful care for patients with cervical radiculopathy and vertigo, physiotherapy treatment is found to be very effective.

Keywords: Cervical Radiculopathy, Vertigo, Diagnosis, Vestibular physiotherapy.

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INTRODUCTION

Radiculopathy, or a pinched nerve in the spine, may cause discomfort, fatigue, and numbness, among other unpleasant symptoms. These intervertebral discs may be affected by injuries, causing compression or inflammation of a nearby nerve root [1]. An individual may develop radiculopathy as a result of an injury or for no apparent cause, depending on which nerve is compressed. When a nerve in the neck or the lumber area is compressed, it is known as cervical or lumbar radiculopathy. Neck and back pain, shoulder and upper back pain, and arm weakness or numbness on one hand are some of the signs of both of them [2] .The annual age-adjusted number of cases in a large observational study population was 83.2/100,000 people (107.3 for men and 63.5 for women), with the highest frequency for both genders in the fifth and sixth decades [2].

After the age of 40, neck pain and cervical radiculopathy are popular spinal diseases, but there are many debates on the best treatment options, such as whether surgical loss of pressure and stabilization procedures are superior to couple of features cures [3].

Radiculopathy can be caused by a number of things, including disc herniation impingement, osteophytes, and disc height decrease. Symptoms include pain, muscle fatigue, numbness, and paresthesia in the arms and fingers. Radiculopathy, which is caused by significant nerve root compression, is likely to produce muscle weakness in the muscles innervated by the damaged nerve root [4]. Medical signs and symptoms are used to diagnose people and determine the extent of cervical pathology. Radiating pain from the spine, on the other hand, may not always be due to nerve root compression. Referred pain may be associated with muscle pain or connective tissue pathology, obscuring the clinical picture. Cervical-brachial pain does not always follow a predetermined pattern. Pain and other radicular signs are also temporary in nature in many patients. Cervical pathology has been related to neck pain. It might be challenging for orthopedic and vestibular rehabilitation practitioners to diagnose and treat individuals with cervical spine dysfunction and concomitant dizziness complaints [5]. The purpose of this article is to

discuss the prevalence rate of tension type dizziness, as well as the historical context and potential pathogenesis. Furthermore, we have discussed the diagnostic criteria, diagnosis, and treatment of vertigo caused by anomalies in the cervical spine. On the basis of history, observation, and vestibular function testing, cariogenic dizziness is diagnosed by combining symptoms of imbalance and dizziness with neck discomfort and rejecting other vestibular disorders. The central nervous system receives abnormal cervical proprioceptive impulses, resulting in a sensory mismatch of vestibular and visual information, causing dizziness and instability. The pathophysiology of a degenerative cervical disc can be linked to vertigo because of the significant relationship through cervical receptors between cervical dorsal roots and vestibular nuclei. Cervicogenic dizziness, also known as cervical vertigo, is a neck-related condition in which a person feels as if they are spinning or the world around them is spinning [6]. This condition is caused by poor neck position, neck diseases, or cervical spine injuries. Trauma, or a head injury that affects head and neck alignment, is a common cause of cervical vertigo. A distinct sense of changing spatial orientation and disequilibrium as a result of a proprioceptive dysfunction of the cervical afferents has been characterized [7]. It develops when the cervical spine is in specific positions or moves, and it might be accompanied with a stiff or uncomfortable feeling in the neck. There are currently no diagnostic tests available to determine whether the patient's dizziness is cervicogenic. It's an exclusionary diagnosis, which means that all other causes of dizziness must be ruled out first [8].

Patient Information

Table 1. Chief & Associated Complaints (Clinical Features)

Nature of Complaints	Intensity	Duration
Chief Complaints		
Vertigo (Dizziness Handicap Inventory Scale)	81 Points (Physical-22 Emotional-31 Functional 28)	Since 2 Year
Tingling Sensation in Right Palm (Neuropathy Scoring Criteria)	Grade III	Since2 Year
Numbness in Hand (Neuropathy Scoring Criteria)	Grade II	Since1 Year
Associated Complaints		
Weakness and Difficulty in Doing His Normal Day to Day Activities Such as Walking, Sitting	Grade I	Since2 Years

Table 2. Diagnosis

Muscle stretch reflex	Using a reflex hammer, the biceps, brachioradialis, and triceps were elicited [1].
SpurlingV Quadrant sign	Patient is seated. The examiner flexes the head laterally, rotates it slightly, and then compresses it with a -7-kg force. A positive test results in the reoccurrence of symptoms [9].
Neck distraction	The patient is lying down with his neck in a relaxed position. Examiner clamps the patient's head under the occiput and chin and gently delivers a -30 Ibs axial traction force. A positive test is shown by the disappearance or lessening of symptoms [3].
Shoulder abduction sign	The patient is recommended to place the affected extremity's hand on the head while seated to assist the afflicted extremity in the scapular plane. Test results were positive [10].
Oculomotor screening	Patients are instructed to sit in a darkened room with a goal in front of them and watch vertical lines pass in front of them. Eye movements are registered by the electronystagmography (ENG) electrodes that cover the eyes. Abnormal responses may suggest a dysfunction with the central nervous system [4].
Positional testing	Patients must lie supine with their heads turned to the left and right, as well as lie full on their left and right sides. The movements of the eyes are observed. Each place in the dark [1].

Table 3: Treatment Protocol

Week	Goals	Range of motion	Intervention
Week 1	1.Reduce pain and inflammation 3.Improve cervical ROM without radicular symptoms 4.Manual therapy to increase joint mobility in the cervical and thoracic spines 5.Postural correction and retraining 6.To reduce dizziness	1.Gentle pain free cervical ROM 2.Pain-free neck ROM progression	1.Active cervical ROM within a pain-free range 2.Active thoracic ROM 3.Scapular retraction exercises 4. If tolerated, deep neck flexor strengthening should be initiated 5.Vestibular rehabilitation Habituation exercise Adaptation exercises Substitution exercise
Week 2	2.Protect injured nerve 3. Improve cervical ROM without radicular symptoms 4.Improve thoracic ROM 5. To improve balance 6. To avoid abnormal eye movement, such as jerking	1.Continue to progress cervical ROM 2.Continue to progress thoracic ROM	1.Continue active cervical ROM within a pain-free range ROM 2.Continue active thoracic ROM 3.Pectoral stretches 4.Scapular retraction exercises 6.If tolerated, deep neck flexor strengthening should be initiated 7.Progression of deep neck flexor strengthening 9.Strengthening of per scapular muscles and thoracic extensors 8. Gaze stability exercise 7. Cervical collar stability exercise
Week 3	1.Restore full pain free strength and ROM to cervical and thoracic spines 2.Functional	1.Stretches to cervical musculature 2.Vertigo management	1.Cervical spine muscle stretches ROM 2.neck strengthening 3.Strengthening of per

	endurance training 3. To improve co-ordination and balance 4. To reduce vertigo		scapular muscles and thoracic extensors 4. Eye movement 5. Head movement 6. Shoulder shrugs
Week 4	1.To reduce pain 2. increase range of motion 3. Reduce imbalance	1.Maintain Full Passive/Active ROM 2.Vestibular rehabilitation	1.Continue T-band and Per scapular Progressions 3 x/ Week as Needed Strengthening 2. neck range of motion exercise 3. sensory integration balance training 4. Dynamic gait 5. Gaze stabilization

Table 4. Result & Observations

Nature chief Complaints	**Before Treatment**	**After (treatment)**
Vertigo while walking	81 points (Physical- 22 Emotional- 31 Functional 28)	31 points (Physical- 07 Emotional- 13 Functional 11)
Tingling	Grade III	Grade I
Numbness	Grade II	Grade 0
Nature associated Complaints		
Weakness in doing his normal day to day activities such as walking, sitting	Grade II	Grade IV

DISCUSSION

Dizziness occurs when patients with cervical radiculopathy feel dizziness and disorientation, as well as neck pain. Manual treatments such as cervical extension traction have shown accuracy in systemic re-modeling of cervical discomfort in symptomatic patients. Only patients who followed an integrative physiotherapy programmer were able to attain long-term results (1 year) symptomatic changes.

Measuring a patient's muscle strength is one technique to determine their functional ability and contact pressure. Muscle exhaustion can be caused by nerve root involvement, as well as discomfort, tiredness, and a change in mood, as well as secondary muscle inactivity owing to long-term pain. Sensory loss in the cervical root dermatomes could also be a cause of patients' fatigue [6]. Depending on how long the root compression has been present, patients with long-term root compression do not regard radicular discomfort to be a major complaint, preferring instead to complain of muscular weariness and sensory loss. This dizziness usually happens when you move your neck, and it can compromise your balance and focus. Vestibular rehabilitation is an activity program designed by a vestibular physiotherapist with specialized training to help people regain their balance and reduce the symptoms of dizziness. The vestibular rehabilitation approach includes vision stability training, postural training, stretching and strengthening exercises, and balance retraining. Cervical dizziness can be efficiently treated with a combination of physical therapy and vestibular rehabilitation when identified accurately [2].

The most prevalent form of vertigo caused by a peripheral vestibular condition is benign paroxysmal positional vertigo (BPPV). It is more frequent in the elderly, making it critical for physicians to test for this disorder in light of our ageing population [11]. The efficacy of vestibular rehabilitation for most common form of BPPV, posterior semi-circular canal, is supported by a Cochrane review and other systematic investigations [12]. According to a Cochrane study, the Canalith repositioning procedure (CRM) is useful as a therapeutic for the posterior canal and it is well tolerated. Canalith repositioning is much more efficient than sham therapy for reducing Canalithiasis in the posterior semicircular canal, according to BPPV and a systematic study by Helminski et al. Habituation, adaptability, and substitution are some of the exercises employed in these topics [6].

Long ago, the surgical method known as "cervical radiculopathy" revealed that relaxing neuronal components can improve general neurological function [10].Despite advances in pain management and balance, he continued to blame dizziness and nausea on head twists, standing or moving with her eyes closed, movement in the surroundings, or irregular visual cues (such as walking through store aisles or in surroundings with busy patterns on the ground or walls) [13]. Due to his dizzy symptoms and the discovery of gaze imbalance during the first evaluation, it was decided to start vestibular therapy in order to lessen his reliance on visual and tactile cues for equilibrium and enhance his use of vestibular signals. Vestibular rehabilitation is occasionally required in the treatment of patients who have dizziness that is considered to be caused by a cervical source. When combining vestibular exercise training with OMPT in the management of acute with cervicogenic vertigo, several publications have observed positive results [9]. Because there isn't enough evidence to support the use of a combination of vestibular physiotherapy and manual therapy above manual therapy alone, you'll have to assess the advantages for each individual patient and identify how much of the vertigo is due to vestibular radiculopathy rather than cervical radiculopathy clinically. Training program can be as basic or as advanced as the patient desires. The aim is not to provoke their dizziness while still developing a stronger sense of balance [8][14].

CONCLUSION

We concluded that the conservative physiotherapy treatment is found to be effective for the treatment of cervical radiculopathy and vertigo. Vestibular rehabilitation is the best treatment for the vertigo. The patient underwent treatment for weeks and it found to improve condition for the patient and all the symptoms resolved after the treatment session. Home program was taught to the patient for further precaution.

Abbreviation

BBPV: Benign paroxysmal positional vertigo

CRM: Canalith repositioning Maneuver

ROM: Range of motion

ENG: Electronystagmography

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