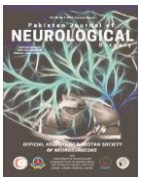

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Original Article (SPINE)

Outcome of Manual Traction in Patients with Cervicogenic Dizziness and Neck Pain

Aatir Javaid[1], Muhammad Asif[2], Sadia Khalid[2], Izza Nasir[3], Saman Shahid[4]

[1] Department of Orthopedic Surgery, University College of Medicine & Dentistry (UCMD), University of Lahore, [2]University Institute of Physical Therapy, University of Lahore

[3]Department of Anesthesia, Mayo Hospital, [4]Department of Sciences & Humanities, National University of Computer & Emerging Sciences (NUCES), LAHORE – PAKISTAN

ABSTRACT

Objective: Symptoms of cervicogenic dizziness include instability, unsteadiness, confusion, neck soreness, and limited cervical range of motion (ROM). We evaluated the outcome of manual traction in patients presenting with dizziness and neck pain.

Materials and Methods: 50 patients included who had dizziness and neck pain with a reduced range of cervical motion. Patients had sessions of manual traction after pre-treatment evaluation. Patients included in the study after history and physical examination were sent to the otorhinology department to rule out the vestibular cause of dizziness. Patients were sent to the Physiotherapy department for manual traction. Pain and dizziness were assessed from VAS and DHI scores.

Results: There were 28 male and 22 female patients. The mean age of the patients was 23.92 ± 11.39 years. The mean VAS scores (dizziness) were 46, 31, and 14 before treatment, at one week, and at one month, respectively. The mean VAS scores (pain) were 40, 21, and 8 before treatment, at one week, and at one month, respectively. The mean DHI scores (for dizziness disability) were 47.5, 34, and 21, at one week and at one month, respectively. There existed a significant difference ($p < 0.00001$) between the VAS and DHI scores before the treatment and post-treatment of follow-up at one week and at one month.

Conclusion: Patients with cervicogenic dizziness who were treated with manual traction improved considerably in terms of dizziness severity, pain relief, and a low score on the dizziness handicap index, indicating better psychological and functional well-being.

Keywords: Cervicogenic Dizziness (CGD), Dizziness Handicap Inventory (DHI), Manual Traction Protocol.

Corresponding Author: Aatir Javaid
Department of Orthopedic Surgery, University of Lahore, Pakistan
Email:aatir.jav@gmail.com

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INTRODUCTION

Cervicogenic dizziness (CGD) was initially described as 'cervical vertigo' by Ryan and Cope in 1955, and it has been a disputed diagnosis at times.[1] Although proprioceptive vertigo, cervicogenic vertigo, and cervical dizziness have all been used to characterize the condition because true vertigo is seldom a symptom of CGD, it is now frequently referred to as cervicogenic dizziness.[2] Cervicogenic dizziness is distinguished by symptoms such as imbalance, unsteadiness, disorientation, neck discomfort, and decreased cervical range of motion (ROM).[2-3] It is sometimes accompanied by a headache. When compared to individuals with simply dizziness, people with both dizziness and neck discomfort had a worse subjective mental and physical quality of life.[4] Dizziness is a fairly prevalent ailment in the community, and it frequently leads to physical difficulties like unsteadiness and falls, as well as social, emotional, and financial concerns.[5] Dizziness can be caused by a variety of factors, one of which is a malfunction in the upper cervical spine. The non-rotary dizziness in this illness, known as cervicogenic dizziness, is defined as instability or unsteadiness and is associated with movements or postures of the neck.[6] Even though it is a crippling ailment, there is no known therapy. When all other causes of dizziness have been ruled out, the cervical spine may be to blame. The source of the symptoms is unknown; however, the existence of faulty cervical proprioceptive signals may be a contributing factor.[7]

According to current understanding, dizzy episodes are caused by disrupted sensory afferents from the neck, resulting in a sensory mismatch between the cervical, visual, and vestibular inputs.[8] The diagnosis is based on the presence of disequilibrium and vertigo in conjunction with neck discomfort, as well as the exclusion of other vestibular illnesses. Given that prolonged neck pain can disrupt cervical proprioception, which can alter spatial orientation, no CGD patient should be denied proper neck pain therapy. Manual therapy is a type of conservative treatment offered by physical therapists. It's aimed to have several effects, including increased tissue extensibility and range of motion, relaxation, altered muscle function, pain modulation, and reduced soft tissue edema and inflammation.[9] A variety of clinical research, including randomized controlled trials, back up manual therapy's effectiveness for CGD. In the last decade, there has been an increase in the number of studies concentrating on manual therapy, especially for CGD. A modest quantity of data supports manual therapy treatment.[10] In the short and medium term, treatment of the cervical spine, with a focus on C1-2 and C2-3, reduces the severity of dizziness.[11] It can also improve the patient's self-perceived impairment status.[12-13] The current study sought to assess the effectiveness of manual traction in individuals presenting with dizziness and neck discomfort.

MATERIALS AND METHODS

Study Design and Setting

A prospective, interventional study that included consecutive 50 patients from the Department of Orthopedic Surgery Alkhidmat Mansoorah Teaching Hospital/The University of Lahore, from Dec 01, 2021, to Feb 28, 2022.

Study Variables

The variables for this study were measured after they were included at baseline (T0). The first follow-up was one week (T1) after the first intervention and the second was at one month (T2).

Assessment of Pain and Dizziness

The visual analogic scale (VAS) was used to measure the level of dizziness and neck pain. Dizziness disability and cervical mobility were examined as secondary outcomes. The Dizziness

Handicap Inventory (DHI) was used to assess Dizziness Disability. DHI is a tool that is extremely dependable and responsive. It consists of 25 questions that are graded on a three-point scale to determine a patient's functional, emotional, and physical limitations. The highest possible score is 100 (28 points for physical, 36 points for emotional, and 36 points for functional), which indicates the greatest possible self-perceived handicap.

Inclusion Criteria

All Patients of both genders in the range of 18 – 65 years of age were enrolled who presented in OPD of Mansoorah Hospital Lahore after consent were included in the study. All these patients had dizziness and neck pain with a reduced range of cervical motion. An otorhinologist opinion was taken to rule out vestibular impairment and other causes of dizziness.

Exclusion Criteria

Those patients were excluded who refused to be part of the study. Patients who had tinnitus, migraine, and hearing loss were not included.

Clinical Management & Physiotherapy

After approval from the hospital's ethical committee, all the patients presenting in the outpatient department, fulfilling the mentioned criteria were included in this study. Patients had sessions of manual traction after pre-treatment evaluation consisting of a detailed medical history, physical examination, X-ray of cervical spine anteroposterior, and lateral views. Patients included in the study after history and physical examination were sent to the otorhinology department to rule out the vestibular cause of dizziness. The patient had their radiograph cervical spine taken and evaluated for spine pathology and degenerative changes.

Patients were sent to the Physiotherapy department for manual traction. On alternating days, patients had three sessions. The sessions lasted 11 minutes each. A manual traction protocol was used. It was done with the patient in a traction and resting position. There were three sections to the protocol that was used. Pre-manipulative section: the patient lies in the supine position. Suboccipital muscle massage was also conducted to make the patient more comfortable and relax the muscle tissue. Traction manipulation in the resting position (TMRP) section: TMRP is a high-speed, low-amplitude technique that uses the least amount of force feasible. The treated segments were C0-C1, C1-C2, and C2-C3. Post-manipulation section: In the supine position, the patient stayed calm for a minute. The intervention was carried out by a physiotherapist with seven years of experience.

Data Analysis

All the data was calculated in SPSS v 26. A non-parametric test Kruskal-Wallis test was applied to see the significant/insignificant differences between three different modalities (before treatment, one week of treatment and one month of treatment) in VAS and DHI scores.

RESULTS

Gender Distribution

There were 28 (56%) male and 22 (44%) female patients.

Age Distribution

The mean age of the patients was 23.92 ± 11.39 years. The maximum age was 63 years and the minimum age was 18 years.

Visual Analog Scores (Dizziness)

The mean VAS score (T0: before treatment) was **46**, with a maximum of 75 and a minimum of 25. The mean VAS score (T1: at one week of

treatment) was **31**, with a maximum of 55 and a minimum of 10. The mean VAS score (T2: at one month of treatment) was **14**, with a maximum of 40 and a minimum of 0.

Visual Analog Scores (Pain)

The mean VAS score (T0: before treatment) was **40** with a maximum of 65 and a minimum of 20. The mean VAS score (T1: at one week of treatment) was **21**, with a maximum of 55 and a minimum of 0. The mean VAS score (T2: at one month of treatment) was **8** with a maximum of 30 and a minimum of 0.

Dizziness Handicap Inventory (DHI) Scores

The mean DHI score (T0: before treatment) was **47.5** with a maximum of 77 and a minimum of 28. The mean DHI score (T1: at one week of treatment) was **34** with a maximum of 60 and a minimum of 17. The mean DHI score (T2: at one month of treatment) was **21** with a maximum of 44 and a minimum of 9.

Comparisons of VAS and DHI Scores at Follow-ups

There existed a significant difference ($p < 0.00001$) between the VAS and DHI scores before the treatment and post-treatment of follow-up at one week and at one month **(Table 1)**.

Radiography

Figure 1(a) depicts before therapy, the patient experienced a lack of lordosis in the cervical spine. **Figure (1b)** illustrates after one month of manual traction, the cervical spine curvature has returned to normal.

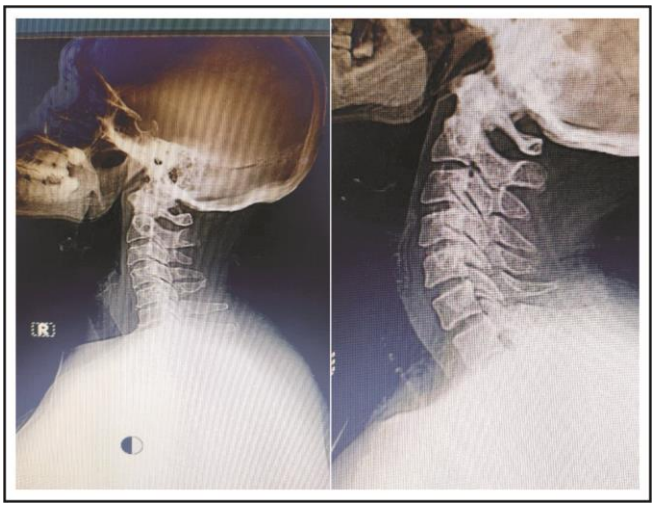

Figure 1(a): Pre-treatment: the patient had a loss of lordosis cervical spine; **Figure 1(b):** Post manual traction (at 1 month): restoration of normal cervical spine curvature (images used with the patient's permission).

Table 1: Comparisons of VAS and DHI scores before/after treatments

	Follow-Ups	H Statistics: Kruskal-Wallis Test	P-value
VAS (for dizziness)	T0: before treatment (mean: **46)** T1: at one week of treatment (mean: **31)** T2: at one month of treatment (mean: **14)**	83.85	<0.00001 (significant result)
VAS (for pain)	T0: before treatment (mean: **40)** T1: at one week of treatment (mean: **21)** T2: at one month of treatment (mean: **8)**	79.30	< 0.00001 (significant result)
DHI (for dizziness disability)	T0: before treatment (mean: **47.5)** T1: at one week of treatment (mean: **34)** T2: at one month of treatment (mean: **21)**	73.64	< 0.00001 (significant result)

DISCUSSION

The goal of the study was to see how effective the manual traction protocol was at reducing the severity of dizziness and pain caused by the CGD. After one month, we discovered that Cervicogenic dizziness patients who received manual traction for therapy improved significantly in terms of dizziness severity, pain alleviation, and a low score on the dizziness handicap index, suggesting greater psychological and functional wellbeing of patients. The mean VAS (dizziness) values were 46, 31, and 14 before therapy, one week later, and one month later, respectively. The mean VAS (pain) ratings were 40, 21, and 8 before therapy, one week afterward, and one month later, respectively. At one week and one month, the mean DHI scores (for dizzy disability) were 47.5, 34, and 21, respectively. We observed a decrement in all pain and dizziness scores. There was a significant difference (p 0.00001) in the VAS and DHI scores before and after therapy, with follow-ups at one week and one month.

Self-perceived assessment after treatment was recorded, resulting in a reduction in dizziness severity and improved cervical range of movement. The findings are in line with earlier research that has shown that manual therapy can lower the severity of dizziness. The dizziness intensity decreased by 33.65 mm in T1 and 26.34 mm in T2. After therapy, there were similar reductions in pain intensity that lasted for a month. At T1 reduction was 10 mm and at T2, it was higher than 22 mm. The DHI is the most often used questionnaire for registering self-perceived disability in dizzy subjects.[13] This questionnaire is widely used in people with CDG. In both follow-ups, the study found statistically significant improvements. In patients with CD, Moustafa et al.[13] used a treatment that included therapeutic exercise, gradual mobilization, myofascial relaxing of the suboccipital muscles, and extension traction. Because Moustafa et al.[4] used a higher dose and a larger number of sessions, it's impossible to compare the outcomes with the current study. After the initial follow-up, both studies demonstrated a statistically significant decrease in the intensity of dizziness and DHI. A reduction in ROM has been observed in people with CGD. The patients in this study had enhanced ROM in all directions, however, the ROM of the upper cervical spine and left rotation improved significantly. Manual treatment appears to elicit immediate analgesic benefits. Pain inhibitors may be activated by the proposed approach, resulting in analgesia.[15-16] CGD is thought to be caused by disharmonic hyperactivity of the cervical mechanoreceptors, according to some researchers.[17-18] The reduction in pain observed after manual traction could be due to a decrease in nociceptive input, which normalizes the mechanoreceptive input causing a reduction in the sensation and intensity of dizziness, as well as an improvement in functional capacity and range of motion. Furthermore, it is theorized that increased ROM normalizes the cervical somatosensory system and aids in the correction of information from the cervical input.[19] The mechanism of manual traction-induced hypoalgesic effects in patients with CGD remains unknown. To define it, more research is needed.

CONCLUSION AND RECOMMENDATION

The manual traction technique resulted in a considerable reduction in the intensity of dizziness and discomfort, as well as an improvement in functional capacity. Cervical spine range of motion improved clinically relieving pain. We suggest further sessions of manual traction at least once a month for further improvement in symptoms and definite resolution.

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Additional Information

Disclosures: Authors report on conflict of interest.

Ethical Review Board Approval: The study was confirmed to the ethical review board requirements.

Human Subject: Consent was obtained by all patients/participants in this study.

Conflict of Interest:

In compliance with the ICMJE uniform disclosures form, all authors declare the following:

Financial Relationships: All authors have declared that they have no financial relationship at present or within the previous three years with any organizations that might have an interest in the submitted work.

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AUTHORS CONTRIBUTIONS

Sr.#	Author's Full Name	Intellectual Contribution to Paper in Terms of:
1.	Aatir Javaid	1. Study design and methodology
2.	Saman Shahid	2. Paper writing and data calculations
3.	Muhammad Asif	3. Data collection and calculations
4.	Sadia Khalid	4. Analysis of data and interpretation of results etc.
5.	Izza Nasir	5. Literature review and referencing