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RESEARCH ARTICLE

EFFECTS OF SOFT TISSUE TECHNIQUE COMBINED WITH THERAPEUTIC PATIENT EDUCATION AND EXERCISES IN PATIENT WITH CERVICOGENIC DIZZINESS

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ABSTRACT

Cervicogenic dizziness characterized by the presence of imbalances, unsteadiness, disorientation, neck pain, and limited cervical range of motion, cervicogenic dizziness can also cause headaches. A conventional sample of 16 patients with Cervicogenic Dizziness will be collected from hospital and physiotherapy clinics. Prior to enrollment, all patients will receive explanation regarding the objective and implication of the study and patient fill the informed consent form. Evaluation criteria will be established to the base on demographic data, history, physical examination and tests. Patients were identified as eligible and invited to participate in the study These patients were randomly be assigned into two Group (group 1 and group 2) after the baseline evaluation. Baseline assessment of patients: intensity of dizziness, Intensity of neck pain, Frequency of dizziness, Cervical ROM, DHI. The combination of soft tissue technique, therapeutic patients education and exercises showed an effective intervention for dizziness and neck disability in cervicogenic dizziness patients. Further high quality trails are recommended to provide more evidence in this regard.

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INTRODUCTION

Cervicogenic dizziness is commonly composed for patients presenting with dizziness associated with neck dysfunction after all other potential causes for the dizziness have been excluded (Malmstrom, 2016). The prevalence of CGD is estimated to 6.4% to 8.5% (Ardiç, 2006; Reid, 2015). In particular, 65% to 66% of dizziness in elderly patients is attributed to cervical spine dysfunction (Kim,5). It has been reported that the proportion of patients with CGD is gradually increasing in the total number of patients with dizziness (6). Cervicogenic dizziness consists of variety of clinical symptoms such as disequilibrium, lightheadedness and general disorientation including with neck pain, limited cervical range of motion and imbalance (Devaraja, 20185; Reiley, 2017). All these complaints may represent psychological reactions which can lead to anxiety, depression, difficulty in activity in daily living and professional work (Yaseen, 2018). Cervicogenic dizziness occurred may be result of damaged of proprioceptive system due to muscular fatigue, degeneration and direct trauma (Li, 2015). Some have informed that the presence of faulty cervical proprioceptive inputs as a contributing factor (Karlberg, 1996). The body requires input from the visual, vestibular and somatosensory systems.

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As part of the somatosensory system, the proprioceptive system in the cervical spine is an important for fine tuning orientation and balance (St George, 2011). Further, pain may cause maladaptive strategies and change the neck muscle coordination and reduce the specificity of neck muscle activation, for instance, through reduced activation of the deep segmental muscles and increased activation of the superficial muscles (Jull, 2019). Pain may also alter the cortical representation and modulation of the cervical afferent input (Treleaven, 2008). The relationship has previously been mostly studied in patients with neck pain; however, it is not established whether the degree of neck pain is associated with the degree of postural control. It is also not known if neck pain influences postural control in dizzy patients as many patients with dizziness suffer from neck pain (Wilhelmsen, 2009; Iglebekk, 2013). Soft tissue technique is defined as the mobilization of muscles and its related connective tissues which support it i.e., tendons and ligaments, these all are classified as soft tissues of the body (Costello, 2016). Soft tissue technique is one of the firstly used therapeutic tools to relive pain (Brummitt, 2008; Kong, 2013). It has been produced as a treatment of choice for various condition such as musculoskeletal disorders, stress (Brummitt, 2008). The popularity of soft tissue technique for pain relief and recovery of function, soft tissue mobilization has become a mostly accepted treatment for musculoskeletal disorders (Patel, 2012).

Soft tissue technique does seem to produce local biochemical changes, which might lead to increased neural activity at the spinal cord level and subcortical nuclei, which might affect mood and pain perception (Patel, 2012; Karels, 2006). It is essential to focus that patient with chronic, nonspecific neck pain combined with cervicogenic dizziness hold abnormal feeling such as a fear of certain movements or pain. Moreover, both dizziness and pain show disability in these kinds of patients (Sagar, 2007).

METHODS

All out patients (n = 34) diagnosed with nonspecific chronic neck pain with dizziness at the hospital and physiotherapy clinics were eligible to participate according to inclusion and exclusion criteria, 16 subjects were enrolled in this study. We received informed consent from all subjects after explaining their rights and the experimental process. 16 subjects participated in this study. Patients with Cervicogenic Dizziness will be collected from hospital and physiotherapy clinics. It is an experimental study design to compare between two Group (group 1 and group 2)A conventional sample of 16 patients with Cervicogenic Dizziness will be collected from hospital and physiotherapy clinics. Prior to enrollment, all patients will receive explanation regarding the objective and implication of the study and patient fill the informed consent form. Evaluation criteria will be established to the base on demographic data, history, physical examination and tests.

Inclusion Criteria

- symptoms of dizziness present for more than 3 months.
- restricted cervical range of movement (flexion, extension, rotation and side-bending).
- Dizziness described as imbalance related to neck movement or position and a stiff and/or painful neck.
- men and women between age 18 and 65 yrs. old.

Exclusion Criteria

- presence of trauma or recent surgery to the head, face, neck or chest.
- presence of other types or causes of dizziness (e.g., BPPV, VBI, migraines, psychogenic dizziness, Tinnitus aural fullness or hearing loss).
- presence of other causes of poor balance (e.g., stroke, PD, cerebellar ataxia, spinal cord pathology).

Instrument And Tools Used

Goniometer, DHI (dizziness handicap inventory), 100mm VAS (visual analogue scale)

Procedure: 16 Patients both male and female age between 18 to 65 years with cervicogenic dizziness: Patients were identified as eligible and invited to participate in the study These patients were randomly be assigned into two Group (group 1 and group 2) after the baseline evaluation. Baseline assessment of patients: intensity of dizziness, Intensity of neck pain, Frequency of dizziness, Cervical range of motion, Disability handicap inventory.

Group 1: - 8 Patients include 5 female and 3 males will receive Therapeutic Patient Education and exercises.

Group 2: 8 Patients include 6 female and 2 males will receive Therapeutic Patient Education and exercises along with Soft Tissue Technique. The patients undergo eight treatment session, two session per week for four weeks with a follow-up of 7 days after the last session. Firstly, Soft Tissue Technique would be done for every treatment session then therapeutic patients' education and exercise therapy.

Soft tissue technique: Techniques included kneading, pulling, transverse strumming and skin rolling for 15mins. Manually pressure was applied to the muscles and soft tissues of the neck in a deep manner in the form of strokes. If the patient complained any increase in their symptoms other than a sensation of local tenderness in the region that the soft tissue technique was being applied, the therapist either decreased the amount of pressure.

Therapeutic patient education: The patients were educated about pain physiology education and pain coping skills education.

Exercises: Motor control and ROM exercises were prescribed in order to improve muscular endurance of deep flexors muscles and to improve the ROM of cervical spine. These exercises were performed at a rate of 3 sets and an intensity of 10–15 repetitions per day. strength exercises were prescribed in order to improve the strength of flexors, rotators and inclinators muscles with an intensity of 3 sets of 5–10 repetitions per day, oculomotor exercises in order to decrease dizziness. The patients were instructed to stretch the major muscles of their cervical spine after all exercise sessions. First explained the exercises and then demonstrated the exercises herself. Next, the patients repeated the exercises under supervision to ensure that their form was correct. Patients were instructed to complete these exercises daily.

RESULTS

According to the Table 8.1, the mean values and standard deviation values are manifested as Flexion has 64.875 ± 5.02, Extension has 48 ± 4.1, Right Rotation has 69.25 ± 4.1, Left Rotation has 66 ± 6.9, Right Lateral Flexion has 21.625 ± 6.11 and the Left lateral Flexion shows 22 ± 4.1, respectively in the baseline of the group 1. According to the Table 8.2, the mean values and standard deviation values are manifested as Flexion has 75.895 ± 3.22, Extension has 56.37 ± 4.24, Right Rotation has 80 ± 3.3, Left Rotation has 80.87 ± 4.08, Right Lateral Flexion has 30.5 ± 4.3 and the Left lateral Flexion shows 31.875 ± 3.52, respectively in the follow up of the group 1. According to the table no. 8.3, the mean and standard deviation values of -Scale is manifested as 35.5 ± 10.62, the DHI- physical scores is as 18 ± 4.5, the DHI-Functional domain is presenting as 12.75 ± 3.8 and the DHI-Emotional manifested as 4.75 ± 2.8, respectively in baseline of Group-1. According to the table no. 8.4, the mean and standard deviation values of -Scale is manifested as 24.5 ± 8.5, the DHI- physical scores is as 14 ± 3.8, the DHI-Functional domain is presenting as 9.25 ± 3.6 and the DHI-Emotional manifested as 1.75 ± 1.6, respectively in follow up of Group-1. According to the table no. 8.5, the mean and standard deviation score for the pain in base line and follow up are represented as 58.5 ± 11.4 and 52.75 ± 10.13, respectively for the Group-1.

Table No. 8.1. Showing the scoring of the Cervical ROM at baseline in Group-1

	Base Line – Group-1					
	Flexion	Extension	Right rotation	Left rotation	Right lateral flexion	Left lateral flexion
Mean -Baseline	64.875	48	69.25	66.25	21.625	22
S.D.	5.02671435	4.1057451	4.13175853	6.90238054	6.11642986	4.14039336

Table No. 8.2. Showing the scoring of the Cervical ROM at Follow up in Group-1

	Follow up-Group-1					
	Flexion	Extension	Right rotation	Left rotation	Right lateral flexion	Left lateral flexion
Mean Follow Up	75.875	56.375	80	80.875	30.5	31.875
S.D.	3.22656385	4.24053568	3.38061702	4.08612635	4.34248119	3.52288437

Table no. 8.3: - Showing the DHI- Psychological scores of base line in Group-1

	DHI- Psychosocial scale -Baseline-Group-1			
	DHI	**DHI physical**	**DHI functional**	**DHI emotional**
Mean -Baseline	**35.5**	**18**	**12.75**	**4.75**
S.D.	**10.6234243**	**4.53557368**	**3.84521967**	**2.81577191**

Table no. 8.4. Showing the DHI- Psychological scores of Follow up in Group-1

	DHI- Psychosocial scale -Follow-up-Group-1			
	DHI	DHI physical	DHI functional	DHI emotional
Mean Follow Up	24.5	14.75	9.25	1.75
S.D.	8.53563957	3.84521967	3.69362385	1.66904592

Table no. 8.5. Showing the mean and standard deviation scores of pains in baseline and follow up of Group-1

	Pain- Baseline	Pain- Follow-up
Mean	58.5	52.75
S.D.	11.4017543	10.138329

Table no. 8.6. Showing the Mean and the Standard deviation score for the frequency of dizziness and the VAS for dizziness intensity in base line of Group-1

	Dizziness Measurement- Baseline- Group-1	
	frequency of dizziness	100mm VAS for dizziness intensity
Mean -Baseline	4.125	66.75
S.D.	0.83452296	10.2364894

Table no. 8.7. Showing the Mean and the Standard deviation score for the frequency of dizziness and the VAS for dizziness intensity in Follow up of Group-1

	Dizziness Measurement- Follow-up- Group-1	
	frequency of dizziness	100mm VAS for dizziness intensity
Mean Follow Up	2.75	50.375
S.D.	1.03509834	15.6290709

Table No. 8.8. Showing the scoring of the Cervical ROM at baseline in Group-2

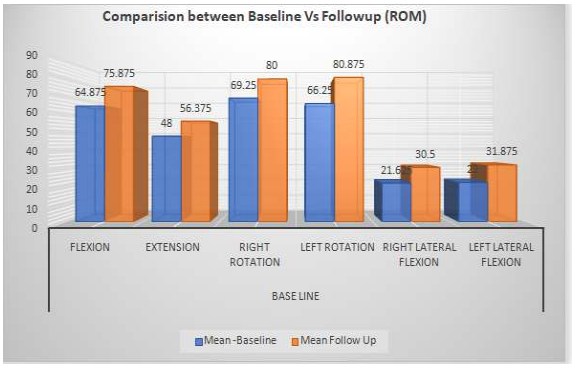
	Base Line- Group-2					
	Flexion	Extension	Right rotation	Left rotation	Right lateral flexion	Left lateral flexion
Mean	63.38	44.13	68.5	64	18.5	19.5
S.D.	6.739	8.871	4.106	2.878	3.964	3.505

Table No. 8.9. Showing the scoring of the Cervical ROM at Follow up in Group-2

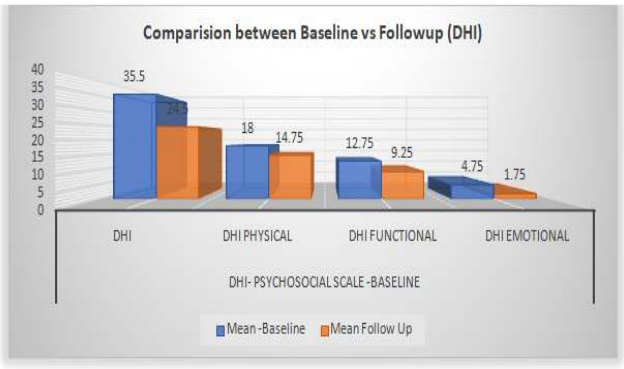
	Follow up- Group-2					
	Flexion	Extension	Right rotation	Left rotation	Right lateral flexion	Left lateral flexion
Mean Follow Up	76	56.63	80.25	80.25	28.5	31.25
S.D.	3.703	6.046	5.994	4.062	5.398	3.808

Table no. 8.10. Showing the DHI- Psychological scores of base line in Group-2

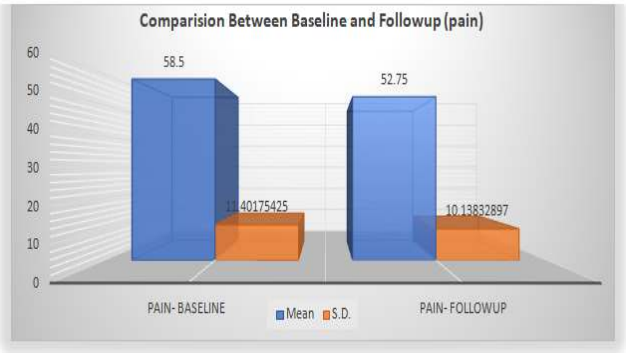
	DHI- Psychosocial scale -Baseline- Group-2			
	DHI	DHI physical	DHI functional	DHI emotional
Mean -Baseline	29.75	14.75	10.5	4.5
S.D.	9.706	4.652	3.338	2.563



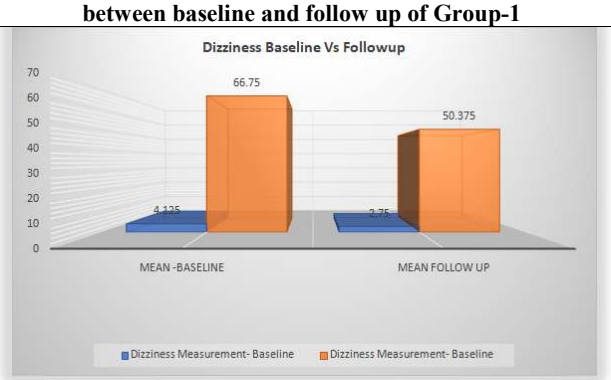
Graph No. 8.1. Showing the Graphical representation of comparison the mean scores of cervical ranges of motion between baseline and follow up of Group-1



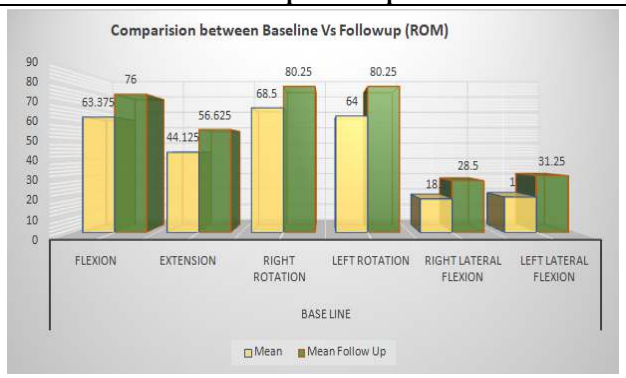
Graph No. 8.2. Showing the Graphical representation of comparison the mean scores of DHI- Psychological Scores between baseline and follow up of Group-1



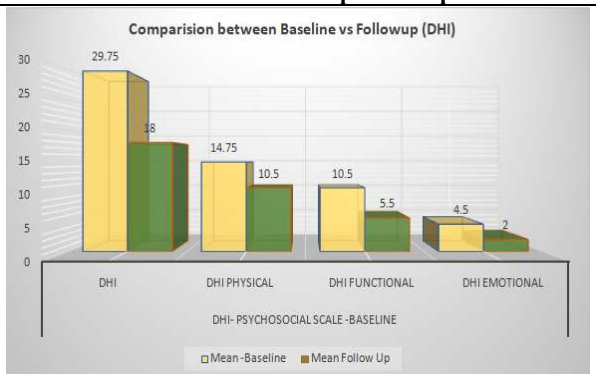
Graph No. 8.3: - Showing the graphical representation for the mean and standard deviation scores of pain in baseline and follow up of Group-1



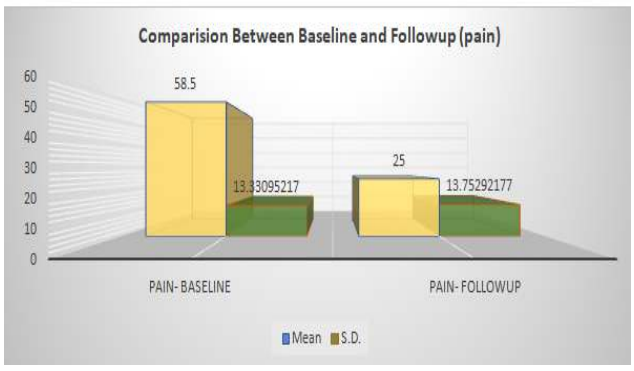
Graph No. 8.4.- Shows the Graphical representation of the comparison between the mean score of the Dizziness score in base line and follow up of Group-1



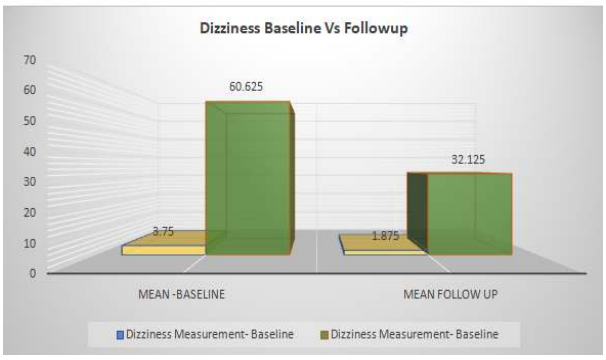
Graph No. 8.5: - Showing the Graphical representation of comparison the mean scores of cervical range of motion between baseline and follow up of Group-2



Graph No. 8.6. Showing the Graphical representation of comparison the mean scores of DHI- Psychological Scores between baseline and follow up of Group-2



Graph No. 8.7: - Showing the graphical representation for the mean and standard deviation scores of pain in baseline and follow up of Group-2



Graph No. 8.8. Shows the Graphical representation of the comparison between the mean score of the Dizziness score in base line and follow up of Group-2

Table no. 8.11: - Showing the DHI- Psychological scores of Follow up in Group-2

	DHI- Psychosocial scale -Follow-up- Group-2			
	DHI	DHI physical	DHI functional	DHI emotional
Mean Follow Up	18	10.5	5.5	2
S.D.	9.196	5.21	2.976	1.512

Table no. 8.12. Showing the mean and standard deviation scores of pain in baseline and follow up of Group-2

	Pain- Baseline	Pain- Follow-up
Mean	58.5	25
S.D.	13.33	13.75

Table no. 8.13: - Showing the Mean and the Standard deviation score for the frequency of dizziness and the VAS for dizziness intensity in base line of Group-2

	Dizziness Measurement- Baseline- Group-2	
	frequency of dizziness	100mm VAS for dizziness intensity
Mean -Baseline	3.75	60.63
S.D.	0.707	10.45

Table no. 8.14. Showing the Mean and the Standard deviation score for the frequency of dizziness and the VAS for dizziness intensity in Follow up of Group-2.

	Dizziness Measurement- Follow-up- Group-2	
	frequency of dizziness	100mm VAS for dizziness intensity
Mean Follow Up	1.875	32.13
S.D.	0.835	9.448

According to the table no. 8.6, the mean and the standard deviation of the dizziness measurement in two domains for the base line is as the frequency of dizziness shows 4.12 ± 0.83 and the VAS for dizziness intensity shows as 66.75 ± 10.23, respectively in Group-1. According to the table no. 8.7, the mean and the standard deviation of the dizziness measurement in two domains for the follow up is as the frequency of dizziness shows 2.75 ± 1.03 and the VAS for dizziness intensity shows as 50.375 ± 15.62, respectively in Group-1. According to the Table 8.8, the mean values and standard deviation values are manifested as Flexion has 63.38 ± 6.73, Extension has 44 ± 8.8, Right Rotation has 68.5 ± 4.1, Left Rotation has 64 ± 2.8, Right Lateral Flexion has 18.5 ± 3.9 and the Left lateral Flexion shows 19.5 ± 3.5, respectively in the baseline of the group 2.

According to the Table 8.9, the mean values and standard deviation values are manifested as Flexion has 76 ± 3.7, Extension has 56.63 ± 6.04, Right Rotation has 80.25 ± 5.99, Left Rotation has 80.25 ± 4.06, Right Lateral Flexion has 28.5 ± 5.3 and the Left lateral Flexion shows 31.25 ± 3.8, respectively in the follow up of the group 2. According to the table no. 8.10, the mean and standard deviation values of -Scale is manifested as 29.75 ± 9.7, the DHI- physical scores is as 14 ± 4.6, the DHI-Functional domain is presenting as 10.5 ± 3.3 and the DHI-Emotional manifested as 4.5 ± 2.5, respectively in baseline of Group-2. According to the table no. 8.11, the mean and standard deviation values of -Scale is manifested as 18 ± 9.19, the DHI- physical scores is as 10.5 ± 5.21, the DHI-Functional domain is presenting as 5.5 ± 2.9 and the DHI-Emotional manifested as 2 ± 1.5, respectively in follow up of Group-2. According to the table no. 8.12, the mean and standard deviation score for the pain in base line and follow up are represented as 58.5 ± 13.3 and 25 ± 13.75, respectively for the Group-2. According to the table no. 8.13, the mean and the standard deviation of the dizziness measurement in two domains for the base line is as the frequency of dizziness shows 3.75 ± 0.70 and the VAS for dizziness intensity shows as 60.63 ± 10.45, respectively in Group-2. According to the table no. 8.14, the mean and the standard deviation of the dizziness measurement in two domains for the follow up is as the frequency of dizziness shows 1.87 ± 0.83 and the VAS for dizziness intensity shows as 32.13 ± 9.44, respectively in Group-2.

DISCUSION

This is the first time the technique has been investigated in the treatment of cervicogenic dizziness. The results provide the benefits of this soft tissue technique combined with therapeutic patient education and exercises for cervicogenic dizziness disability, neck pain and support the cervicogenic origins of this form of dizziness. The main aim of this combined interventions was focused on the improvement of physical and psychological complaints of patients with cervicogenic dizziness. The results of our study show that the treatment with soft tissue technique, therapeutic patients education and exercises for patients with cervicogenic dizziness seems to be beneficial in reducing dizziness, neck pain, disability and improving cervical ROM. A typical examination should always begin with a general inspection, followed by palpation, range of motion and special manoeuvres. This will focus mainly on assessing the range of motion of the cervical spine. There is no set treatment approach for cervicogenic dizziness just as there is no gold standard assessment for diagnosis. Here are some of the ways we can approach the cervical, vestibular and sensorimotor impairments found to be associated with cervicogenic dizziness.

As the research continues to develop so will our understanding of the neurophysiological mechanisms underlying persistent neck pain, dizziness and unsteadiness in both cervicogenic dizziness. Identifying deficits in sensorimotor function is only the beginning of a new approach to manage cervicogenic dizziness, as we discover more about the dysfunction in cervical afferent function. In order for our interventions to accurately target the contributing impairments involved in dizziness we need to carefully assess neurological function, the cervical spine and sensorimotor dysfunction. While neck pain may be present in patients with cervicogenic dizziness, it is the impairments in oculomotor system and balance systems that help distinguish this type of dizziness from true vertigo, BPPV and other conditions. Treatments that collectively target these impairments are likely to have the most positive outcomes in patient improvement. The protocol and justification for the first time study in Patients with cervicogenic dizziness to investigate whether adding an treatment of soft tissue technique with therapeutic patient education and exercises protocol confers benefits over and above a treatment of Therapeutic Patient Education and exercises protocol. It will also evaluate short effect of adding the soft tissue technique with therapeutic patient education and exercises protocol.it was not possible to calculate an overall effect size for soft tissue technique with therapeutic patient education and exercises at long term Follow-up due to the lack of studies examination this end point. According to the present study the Cervical Range of Motion domain Flexion is improved in

Group-2, the Extension, Right Rotation, Left Rotation, and the Left Lateral Flexion is remains the same in both the groups. Whether, Right Lateral Flexion is improved in the Group-1. The DHI- Psychological scale scores are showing the improvement in Goroup-2 in all the domains i.e., DHI, DHI-Physical, DHI-Functional, but in the scores of DHI-Emotional statuses both the groups i.e., 1 and 2 is showing approx. same improvement. In the pain status of the Group-2 is showing the improvement of approximately 50% as comparing with the Group-1. Similarly, Dizziness measuring scores are showing more improvement in Group-2 with all two domains i.e., Dizziness frequency and VAS for dizziness intensity. However, further high quality trails are recommended to provide more conclusive evidence in this regard.

CONCLUSION

In conclusion, our results showed a potential for interventions which are the combination of soft tissue technique, therapeutic patients education and exercises are effective in reducing dizziness disability, neck disability and also improving psycholsocial status in Patients with cervicogenic dizziness.

Limitations

- Due to the limited time, the long-term effects of therapeutic patient education & exercises were not assessed.
- Soft tissue technique treatment protocol was found to be more beneficial in short term.
- Soft tissue technique only immediate effects of reduce neck pain.
- Study was conducted during the COVID-19 pandemic time period which led to reduce the sample size.
- Sample size can be increased and could be assessed for long term effect in further study.

Ethical Clearance: As per the Ref. No IAMR/22/4080 Institute of Applied Medicine and Research given the ethical Clearance for the research. There is no funding and no Conflict of interest.

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