

Manual therapy approach to address cervicogenic headache and vertigo secondary to tubercular meningitis and granuloma: A Case Study

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Abstract- This case report presents the clinical course of a 22-year-old female who initially presented with CNS tubercular granuloma and meningitis requiring hospitalization, tracheostomy, and antitubercular therapy. Despite successful treatment, the patient continued to experience persistent vertigo and headache, unresponsive to pharmacological interventions. Subsequent evaluation by the physiotherapy department revealed cervicogenic headache, for which manual therapy and physiotherapy interventions provided significant relief. A structured physiotherapy program incorporating manual therapy techniques and therapeutic exercises in managing cervicogenic headache showed better outcome results.

Keywords: cervicogenic headache, tubercular granuloma, meningitis, rehabilitation

Introduction:

Cervicogenic headache is a secondary headache disorder characterized by pain referred from the cervical spine structures. It can mimic symptoms of other primary headache disorders, making diagnosis challenging, especially in complex cases with multiple comorbidities such as CNS tuberculosis. The International Headache Society (IHS)¹ has classified headaches as primary, where there is no other causative factor, or secondary, where the headache occurs in close temporal relationship to another disorder to which it is attributed. The most common form of headache is tension-type headache with a global prevalence of 38%¹, whereas migraine has a prevalence of 10%¹, chronic daily headache 3%¹, and CGH 2.5–4.1%². The main symptoms of a cervicogenic headache are a combination of unilateral pain, ipsilateral diffuse shoulder, and arm pain. ROM in the neck is reduced, and pain is relieved with anesthetic blockades.

The pathophysiology of headache is the C1-C3 nerves relay pain signals to the nociceptive nucleus of the head and neck, the trigeminocervical nucleus. This connection is thought to be the cause of referred pain to the occiput and/or eyes. Aseptic inflammation and neurotransmission within the C-fibres caused by cervical disc pathology are thought to produce and worsen the pain in a cervicogenic headache³.

The trigeminocervical nucleus receives afferents from the trigeminal nerve and the upper three cervical spinal nerves. Neck trauma, whiplash, strain, or chronic spasm of the scalp, neck, or shoulder muscles can increase the sensitivity of the area, which is similar to the allodynia that is seen in late chronic migraines. A lower pain threshold makes patients more susceptible to more severe pain. For this reason, early diagnosis and therapeutic intervention are very important. Physiotherapists are crucial in the preparation and rehabilitation of patients who have had cervicogenic headache secondary to CNS tubercular granuloma and meningitis. Aside from possessing a vast arsenal of techniques, incorporating rehabilitation for pain and radiations at this time can be crucial and will provide effective management and improve the overall quality of life.

Case Presentation:

A 22-year-old female presented with complaints of severe headache and vertigo. She had a history of CNS tubercular granuloma and meningitis, for which she underwent hospitalization for 1 month 7 days in which client was intubated due to fall in GCS scale. During admission the scale was E2VetM5. On observation she presents with right side ptosis, left UMN palsy, right 12th nerve palsy. During hospital stay she was on ventilatory support for 15 days, and antitubercular therapy continued. Despite completion of treatment, she continued to experience persistent headaches and vertigo. Pharmacological interventions failed to provide relief, prompting referral to the physiotherapy department.

Diagnostic assessment and interpretation:

MRI BRAIN WITH CONTRAST was done which showed diffuse FLAIR hyper intense signal and smooth diffuse enhancement within the cortical sulci and Sylvain fissures and in the interpeduncular cisterns and along the surface of

the brainstem and cerebellar folia suggestive of diffuse leptomeningeal enhancement-possibly infective leptomeninges's A well-defined irregular shape focal T1, T2 hypo intense peripherally enhancing space occupying lesion in the involving the vermis and right paravermian cerebellum with few small satellite enhancing nodules along the superior and the lateral margin of the lesion. The imaging appearance suggestive of infective granulomatous lesion such as tubercular granuloma. On diffusion weighted imaging, large confluent area of diffusion restriction is seen involving the anteromedial right temporal lobe extending laterally to involve the lateral right temporal cortex and superiorly in the right insular cortex. The lesion is also involving the bilateral Basal frontal lobes and cingulate and superior frontal gyrus. Small curvilinear areas of diffusion restriction are also seen in the bilateral hippocampal Head and body. Small area of diffusion restriction is seen in the anteromedial part of the left temporal lobe cortex, Small mild thin diffusion restriction is seen along the left insular cortex. Diffusion restrictions is seen involving the left lateral pons. All these areas of diffusion restriction could be due to acute infective vasculitis infarcts secondary to meningitis. Other differential consideration is acute infective viral encephalitis such as herpes encephalitis.

Diagnostic Assessment:

On evaluation by the physiotherapy department, the patient exhibited tenderness and restricted range of motion in the cervical spine, along with palpable muscle tightness and triggers points in the neck and shoulder region. Cervical spine examination revealed reduced cervical flexion and extension, indicative of cervical dysfunction. Based on these findings and in correlation with the patient's clinical history, a diagnosis of cervicogenic headache was made and a therapeutic regime was followed.

Therapeutic Intervention:

The patient underwent a 15-session physiotherapy program, with each session tailored to address specific impairments identified during the initial assessment. The sessions were structured as follows:

S.NO.	Session days	Intervention goal	Intervention	Treatment Regime
1.	1 st day	To provide awareness of the condition, and gain co-operation & consent of the patient and her family members	Patient and caregiver education and counselling about the exercise regimen and the importance of adherence to it.	Patient and caregivers were educated about the importance of positioning and adherence to an exercise regimen.
2.	1-3rd Day	To maintain joint integrity & mobility	<ul style="list-style-type: none"> Soft tissue massage and myofascial release to address muscle tightness and trigger points in the cervical and shoulder region. Sub occipital muscles, scalene, levator scapulae, clavi pectoral fascia release. 	Range of motion exercises initiated to improve cervical spine mobility. 10 reps x one set two times a day.
3.	4-6 Day	Increase the flexibility around the head and neck region.	<ul style="list-style-type: none"> Joint mobilization techniques focusing on improving cervical spine segmental mobility. C1, C2 manipulation. Thoracic mobilisation 	10 - 15 minutes a day.
4.	7-10 Day	Maintenance of upright posture.	<ul style="list-style-type: none"> Postural correction exercises. Scapular stabilisation exercises. Progression to 	Conscious correction of her posture by avoiding slouching by self-

			more advanced therapeutic exercises targeting cervical spine stability and strength.	feedback and passive feedback from relatives whenever she was seen slouching.
5.	11-15 day	Self - management strategies	<ul style="list-style-type: none"> Continuation and progression of therapeutic exercises. Ergonomic modifications in daily activities. 	Continuation of the Home exercise program.

TABLE: 1 Summarizes the rehabilitation provided.

Outcome:

Follow-up and outcome of the intervention:

The outcome measures that were used to assess the progress of the patient on the first day of referral and the day of discharge are shown in Table 2. Following completion of the physiotherapy program, the patient reported significant improvement in headache intensity, frequency, and duration as assessed by the VAS and headache diary. Vertigo episodes also reduced in frequency and severity. Post-treatment assessment revealed improved cervical range of motion and reduced tenderness in the cervical spine region.

S. NO.	OUTCOME MEASURES	WEEK 1	WEEK 2	Discharge (15 th day)
1.	VAS	9	3	1
2.	Frequency	20 episodes	4 episodes	Almost zero
3.	Cervical ROM	Neck flexion: 40* Extension: 30*	F: 80* E: 60*	F: 80* E: 60*
4.	Neck disability index	45	10	1
5.	Head disability index	94	36	4

TABLE 2: The values of outcome measures used to evaluate the progress of the patient.

Discussion:

This case highlights the effectiveness of a structured physiotherapy program incorporating manual therapy techniques and therapeutic exercises in managing cervicogenic headache in a patient with a history of CNS tuberculosis and meningitis. Outcome measures such as VAS for pain intensity, headache diary, and cervical ROM, Neck and head disability assessment provided objective data to evaluate treatment efficacy.

The results indicate that cervical manipulation, mobilization, along with exercise, were the most effective conservative interventions for decreasing CGH intensity, frequency, and neck pain, which is consistent with the literature⁴. A variety of manual procedures, whether patient-driven or therapist-driven, with the combination of therapeutic exercise may improve patients' pain outcomes.

Different protocols of action have been studied, such as mobilization of the cervical and thoracic spine accompanied by a program of postural re-education of the head and neck⁵ myofascial release techniques⁶, suboccipital inhibition and manipulation of the upper cervical vertebrae, isolated and combined, massage therapy and treatment of trigger points in the cranio-cervical-mandibular region, manipulation of upper cervical vertebrae, neural mobilization techniques and relaxation of the cranio-cervical soft tissue. All these techniques applied in this case and we found a positive results with better outcomes.

Conclusion:

In patients with a history of CNS tuberculosis and meningitis presenting with persistent headache and vertigo, cervicogenic headache should be considered as a differential diagnosis. A tailored physiotherapy program addressing cervical spine dysfunction can provide significant relief and improve functional outcomes in these patients.

Conflict of Interest:

The authors declare no conflict of interest.

Informed Consent:

Informed consent was obtained from the patient for publication of this case report.

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