

## A Study to Compare the Effect of Intermittent Mechanical Traction and Manual Traction to Reduce Pain and Radiculopathy on Cervical Spondylosis

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### Abstract

*Objective:* The purpose of study was to compare the effect of Intermittent mechanical traction and intermittent manual traction to reduce pain and radiculopathy on cervical spondylosis. *Methods:* Forty patients both male and female of cervical spondylosis with radiculopathy were randomly divided into two groups group A (n=20) was given Intermittent Mechanical traction and group B (n=20) was given manual traction Both groups were also administered a common conventional exercise protocol. The outcome measures used were Neck disability index (NDI), Visual Analogue Scale (VAS). The subjects were assessed pre-treatment test i.e. at the first day of treatment and after the 3 weeks of the treatment i.e. at the last day of the treatment. *Result:* The result showed a statistically significant improvement ( $p < 0.05$ ) in all assessment parameters in pre to post treatment in all groups. After three weeks on comparing Group A and Group B the mean change, improvement in pain ( $1.8 \pm .5232$ ) vs. ( $2.2 \pm .7678$ ), NDI ( $5.05 \pm 1.4681$  vs.  $7.25 \pm 2.7697$ ).

**Keywords:** Intermittent Mechanical Traction; Manual Traction.

### Introduction

Neck pain is becoming increasingly common throughout the world. The overall prevalence of neck pain in the general ranges between 0.4% to 41.5% (mean 14.4%) and 1 year prevalence ranges from 4.8 to 79.5% (mean: 25.8%) prevalence is generally higher in women higher in high - income countries compared with low and middle income countries and higher in urban areas compared with rural areas. Most studies indicates a higher incidence of neck pain among women and an increased risk of developing neck pain until the 35-49 years age group after which the risk beings to decline [1]. In cross sectional studies neck pain has been associated with

self-reported poor general health status, psychological distress, and previous neck injury, in addition to other factor such as occupational tasks and obesity. Neck pain and its related disability have a huge impact on individuals and their families, communities, health - care system and business [2]. It has major economic consequence through the cost of health - care, work absenteeism, insurance and pressure health care system. The natural history is unclear. Non specific neck pain is generally caused due to wrong posture. The other causes are cervical spondylosis, whiplash, sprains, rhamatoid arthritis, ankylosis spondylosis other inflammatory disease.

Cervical spondylosis signifies progressive degeneration of the intervertebral disc leading to changes in the surrounding structures especially bones and meninges [13] its signs and symptoms include pain, limitation of neck movement, headache pain radiating to upperlimb paraesthesia, vertebro-basilar insufficiency may be present. The signs and systems can be present singly or in combination However it has been observed that in adults more than 40 years about 60% have degeneration disc disease, 20% have for foraminal stenosis, both of which may irritate nocieptors, further more, advanced spondylotic changes can narrow the vertebral and intervertebral foramina and restrict cervical mobility

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resulting in pain and dysfunction [13].

The physiotherapy treatment of cervical spondylosis includes patients education, posture corrections, and ergonomics, Electrotherapy, Manual therapy and Exercises. The recurrence rate of neck pain is high approximately 60% of all episodes are followed by a relapse [13] although neck pain is most frequent disorder treated by physiotherapist all over, there is no consensus about the management of this condition. Many interventions like traction, active and passive exercise, ultrasound, transcutaneous electrical nerve stimulation. Interferential therapy, patient education all these are useful generally for the treatment but the evidence of their effectiveness is lacking.

A study shows combined mechanical traction and exercise has resulted in improved patient outcomes or satisfaction level when compared to spinal manipulation or exercise alone [4]. In the other study there was no statistically significant difference between continuous and placebo traction in reducing pain or improving function for individuals with chronic neck disorder with radicular symptoms [10].

One of the commonly used treatment for cervical spondylosis is traction. Traction can be given in various forms such as manual traction, mechanical traction suspension and bed traction [10]. Out of these the most commonly used are the manual and mechanical traction, which one is more effective form of treatment is unknown. This the purpose of our study is to compare the effectiveness of intermittent mechanical traction with manual traction.

## Methodology

### Study Approach

The subject assessed on the basis of inclusion criteria as cervical spondylosis were requested to participate in study. The purpose of study was explained and consent form was taken from each subjects. All the subjects were assessed using a similar assessment Performa and assigned randomly to either of the group.

### Inclusion Criteria

- Age Group – 30 to 50
- Gender - Both sex
- Neck pain - Radiculopathy
- Presence of sign and symptoms of Cervical Spondylosis

- Showing x-ray changes

### Exclusion Criteria

- No other pathology
- Age not above 50 years
- Traumatic condition
- Fracture around cervical
- Vertigo dizziness

### Sample Selection – Random Sampling

40 subjects were randomly allocated which were based on inclusion and exclusion criteria.

### Study Design

Pre and post test comparative design with Group A and B.

### Sample Size

40 subjects (20 in each) duration of the study 3 weeks.

### Outcome Measures

Visual analogue scale and neck disability index.

*Place of Study:* Subharti College of physiotherapy & OPD of CSSH swami Vivekananda Subharti University Meerut, Uttar Pradesh (U.P) India.

### Tool Used in the Study

- Stationary
- Hand sanitizer
- Couch
- Towel

### Treatment Procedure

Ethical approval was obtained from the board of studies of Jyoti Rao phule Subharti College of physiotherapy, Swamivivekanand Subharti University, Meerut, (U.P) India.

### GROUP (A)

#### Intermittent Mechanical Traction

Position of the patient is supine to obtained maximum lower posterior separation of vertebrae's the head should be flexed upto 20<sup>0</sup> to 30<sup>0</sup> and apply the halter over the chin and occiput comfortably major traction force must be against the occiput not the chin

1/10<sup>th</sup> of the total body weight applied for 10 minutes which includes 20 second hold and 5 second relaxation period during cervical traction provides better results [15], thus we have used it in the study.

*Group (B)*

*Manual Traction : Cervical Spine*

Traction techniques can be used for the purpose of stretching the muscle and the facet joint capsules and widening the intervertebral foramina. The value of manual traction is that, the angle of pull, head position and placement of the force can be controlled by the therapist, thus the force can be specifically applied with minimum stress to regions that should not be stretched. Patient is in supine lying on position table, therapist standing at the head of the treatment table, supporting the weight of the patients head in the hands of the therapist place one hand under chin and another hand on occiput, place the index fingers

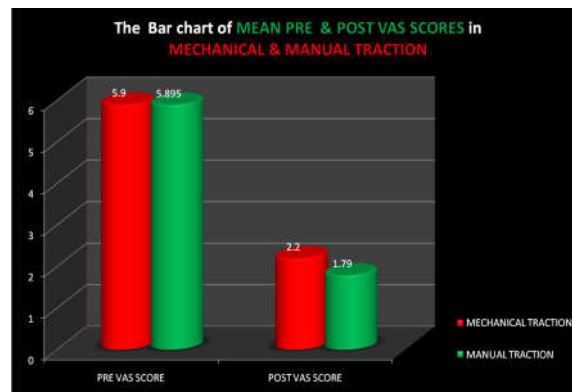
around the spinous process above the vertebral level to be moved. This hand placement provides a specific traction only to the vertebral segments below the level at which the fingers are placed [16]. Then apply a traction force by assuming a stable stance and leaning backward in a controlled manner. The force is usually applied intermittently with smooth and gradual building and releasing of the force. The intensity and duration are usually limited by the therapist's strength and endurance.

**Result**

The result showed a statistically significant improvement ( $p < 0.05$ ) in all assessment parameters in pre to post treatment in all groups. After three weeks on comparing Group A and Group B the mean change, improvement in pain ( $1.8 \pm .5232$ ) vs. ( $2.2 \pm .7678$ ), NDI ( $5.05 \pm 1.4681$  vs.  $7.25 \pm 2.7697$ ).

**Table 1:** Mean, standard deviation & s.e.m. for pre vas score & post vas score intermitent mechanical & manual traction

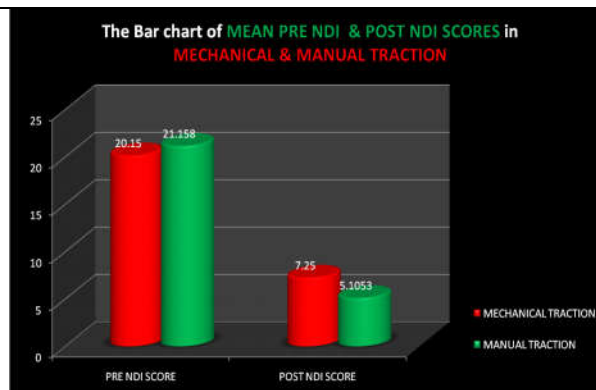
S. No.	Time Periods	Mechanical (Mean±S.D.)	S.E.M.	Manual (Mean±S.D.)	S.E.M.
1	Pre Vas Score	5.9±1.586	0.27	5.895±1.243	.3540
2	Post Vas Score	2.2±.7677	0.1168	1.7895±.5353	.1714



**Fig. 1:**

**Table 2:** Mean, standard deviation & s.e.m. for pre ndi score & post ndi score intermitent mechanical & manual traction

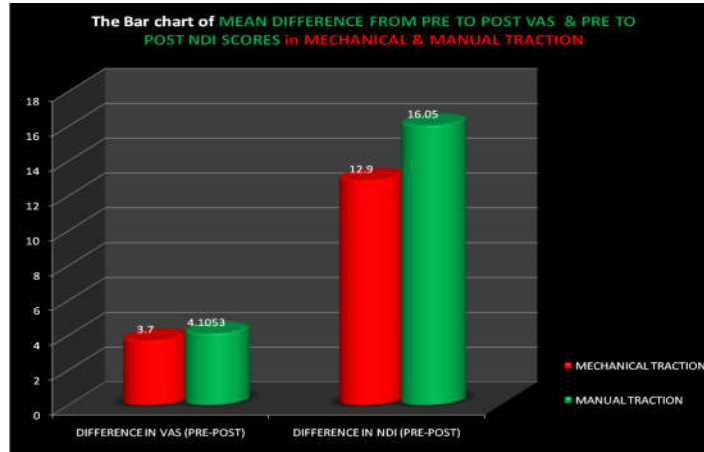
S. No.	Time Periods	Mechanical Mean±S.D.)	S.E.M.	Manual (Mean±S.D.)	S.E.M.
1	Pre NDI Score	20.15±7.3862	1.0671	21.158±4.8678	1.6487
2	Post NDI Score	7.25±2.7697	0.3277	5.1053±1.4868	.6182



**Fig. 2:**

**Table 3:** Mean, standard deviation for the difference (pre to post) ndi score vas score intermitent mechanical & manual traction

S. No.	Time- Difference	Mechanical (Difference)	Manual (Difference)
1	(PRE- POST) VAS SCORE	3.7±1.0809	4.1053±.9366
2	(PRE- POST) NDI SCORE	12.9±5.9727	16.05±3.923



**Fig. 3:**

**Table 4:** Comparasion b/w pre to post vas score & pre to post ndi score (by paired “t” test) intermitent mechanical & manual traction

S. No.	Type of Scores	Intermitent Mechanical (P-Value)	Manual (P-Value)
1	VAS SCORE	.0000* P<.05 (SIG.)	.0000* P<.05 (SIG.)
2	NDI SCORE	.0000* P<.05 (SIG.)	.0000* P<.05 (SIG.)

\*p<.05 shows a significant difference at á=.05 level of significance.

**Discussion**

A comparative study has been done, to see the effect of intermittent cervical mechanical traction and cervical manual traction to reduce pain and radiculopathy on cervical spondylosis patient. The study is done on 40 patients, which are equally divided into two groups (Group- A and Group-B). I have given intermittent cervical mechanical traction to Group-A patients and cervical manual traction to Group-B patients. The measurement has been taken by VAS (visual analogue scale) and NDI (neck disability index) respectively. The measurement has been taken on day one and after the last day of third week.

The result show after measuring VAS and NDI on last day of third week that in Group-A the mean VAS(5.9+1.586 vs. 2.2+-.7677), NDI(20.15+7.3862 vs. 7.25 +-.2.7697) at post treatment decreased (improved) significantly (p<0.05) as compared to pre treatment.

Group- B the mean VAS(5.895+1.243 vs. 1.7895+-.5353), NDI(21.158+4.8678 vs. 5.1053+1.4868) at post treatment decreased (improved) significantly (p<0.05) as compared to pre treatment. After three weeks, on comparing Group-A and Group-B the mean change improved in pain (2.2+-.7677) vs. (1.7895+-.5353), Disability(7.25+-.2.7697 vs.(5.1053+1.4868) in Mechanical traction group improved

significantly (p<0.05) more than the manual traction group. The study reported a reduction in pain and improved NDI in the group that received mechanical traction than either of another group. Intermittent traction improves the circulation to the tissues and reduces swelling of the tissues thus helps to relieve the inflammatory reaction of nerve roots. This approach is clinically therapeutic for two reasons. Firstly it is a form of stretching that lengthens all vertically oriented soft tissues of the neck. Secondly it decreases the weight bearing compression forces upon the joint surfaces, intervertebral discs and intervertebral foramina of the cervical spine. Some theories suggest that the stimulation of the proprioceptive receptors in the vertebral ligaments and mono segmental muscle may alter or inhibit abnormal neural input from these structures. When we stretch the neck in one direction, we introduce a stretching and lengthening force into most every soft tissue of the neck. However, we also create a compression force on the opposite side of the spine. For example, if we stretch the subject’s neck into right lateral flexion, we do so by moving the neck into left lateral flexion, thereby causing compression to the left side. Cervical traction achieves a desired stretch, without causing any compression.

In Mechanical traction the affected level of the spine. As the traction separates the spinous process,

the intervertebral foramina size increase thus relieving the compressed nerve root giving faster relief in radiation and also improves the intervertebral movement at that level. In Manual traction angle the pull is distributed over the entire cervical spine not concentrating it on a particular affected area. Thus manual traction gives a generalized treatment unlike mechanical traction which is localized on affected segment.

### Conclusion

The result of the study suggest that the effect of Intermittent Mechanical traction is better than manual traction in cervical spondylosis. Thus Intermittent Mechanical traction can be considered as the treatment of choice over manual traction for cervical spondylosis with or without radiculopathy.

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