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The short-term effects of cervical traction on neck mobility (flexion and extension) in patients with cervical spondylosis

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Abstract

Objective of the study: Objective of this study was to find out the short-term effects of cervical traction on neck mobility (flexion and extension) in patients with cervical spondylosis.

Material and methods: Study was conducted in population of Sargodha, seeking physiotherapy treatment for neck pain in physiotherapy rehabilitation departments and centers. Study was randomized controlled and multicenter. 30 patients were selected by inclusion and exclusion criteria and were divided randomly into two groups. Group 1 obtained manual intermittent cervical traction. Group 2 obtained sustained cervical traction. Duration of study was 6 months. Intervention was short term (one session only). A baseline measurement was taken ROM (range of motion) by Goniometer. The post intervention measurement (immediate post intervention & 05 mins after the intervention) was taken on same outcome measurement tool.

Results: The mean age of population included in study was 31.33 ± 7.42. The minimum age was 19 years and maximum were 47 years. The sample size was 30, in which 16 (53.3%) were male and 14 (46.7%) were female. Out of 30 patients 27 (90%) patients were with acute neck pain and 3 (10%) were with chronic pain. The analysis shows that there was more improvement in range of motion (flexion and extension) with sustained traction as compared to intermittent traction. The improvement in ROM (Rt. And Lt. rotation) was more marked in sustained traction as compared to intermittent traction.

Conclusion: Study concluded that results are not significant when compared between the groups. Study also concluded that the effects of intervention are not maintained for 05 minutes of single session of intervention. There is significant improvement in pain in both groups in pre to post score. There is not significant improvement after 05 minutes of interventions in both groups when compared the baseline intervention to 05 minutes of intervention.

Keywords: Cervical spondylosis, Manual traction, Intermittent cervical traction, Sustained cervical traction

Introduction

Vertebrae, alongside intervertebral circles, create the vertebral segment, or spine, from the skull to the coccyx incorporating cervical, thoracic, lumbar and sacral areas. The cervical region contains seven vertebrae (C1-C7) [1]. Three atypical vertebrae found C1, known as "ATLAS" includes both a vertebral body and a spinous procedure the articular aspects contact the occipital condyles of the skull and the sub-par features explain features of C2. C2, called "pivot", contains respective masses to explain with C1, a body, to transmit weight through C3 and it contains a long spinous process called as "vertebra prominens" [2]. Vertebrae comprise of a vertebral body, a vertebral curve These transverse foramina enclose the vertebral courses and veins. Cervical vertebrae specific is the perfidious spinous process which may serve to expand surface territory for muscle connection [3]. The meningeal branches of spinal nerves innervate all vertebrae. Cervical vertebrae provide points of attachment for numerous muscles that include erector spinae, interspinae, intertransversarii, levator scapulae, multifidus, obliquus capitis, rectus capitis, rhomboid minor, rotators, semispinalis, splenius capitis, and trapezius [4].

Chronic neck pain is either a mechanical or degenerative issue. Degenerative causes involve intervertebral discs and adjacent areas with the formation of osteophyte along stiffness or neurological complications [5]. "Non-specific (simple) neck pain," with postural or mechanical related symptoms. Etiological factors are multifactorial, including poor posture, anxiety, depression, and neck strain sporting and also include occupational activities and Whiplash related injury [5]. Cervical spondylosis is a mechanical generalized disease process affecting all levels of the cervical spine [6] with a sequence of degenerative changes in the intervertebral discs, osteophytosis of the vertebral bodies, hypertrophy of the facets and laminal arches, and ligamentous and segmental instability [7]. It is a common cause of nontraumatic myelopathy, resulting in paraparesis and quadriparesis [8]. The occurrence rate of bulge or herniation at C3-C4, C4-C5, C5-C6, and C6-C7 increased with aging [9]. Cervical spondylosis is a disorder for age-related wear affecting the disks and vertebrae of cervical spine [6] when morphologic sequelae are superimposed on a developmentally narrow spinal canal. The two clinical syndromes of spondylitis radiculopathy and myelopathy are distinct, yet they may overlap [10]. Incidence of cervical spondylosis is proportional to the progress of age [9]. Cervical pain aggravated by movement Referred pain (occiput, between the shoulders blades, upper limbs), Retro-orbital or temporal pain (from C1 to C2), Cervical stiffness reversible or irreversible Vague numbness, tingling or weakness in upper limbs, Dizziness or vertigo, Poor balance Rarely syncope, triggers migraine, pseudo-angina [11].

In 2005, case of a consecutive series of patients presenting to physical therapy with cervical radiculopathy and managed with the

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use of manual physical therapy, cervical traction and strengthening exercises. Eleven consecutive patients (mean age, 51.7 years; SD, 8.2) who presented with cervical radiculopathy were treated with manual physical therapy, cervical traction, and strengthening exercises of the deep neck flexors and scapulothoracic muscles. Wit completed self-report measures of pain and function, including a numeric pain rating scale (NPRS), the Neck Disability Index (NDI) and the Patient-Specific Functional Scale (PSFS). At a 6-month follow-up session 91% demonstrated a clinically meaningful improvement in pain and function following a physical therapy visits and at the 6-month follow-up [12].

In 2008, Forty-two patients with at least 6 weeks of non-specific neck pain were selected for the study. Data about demographic characteristics including age, sex, body mass index, duration of cervical pain, working status, smoking status and regular exercise were recorded. Each patient was randomly assigned to Group 1— receiving only standard physical therapy including hot pack, ultrasound therapy and exercise program and Group 2—treated with traction therapy in addition to standard physical therapy. The patients were reevaluated at the end of the therapy. The main outcome measures of the treatment were pain intensity by visual analog scale (VAS), disability by neck disability index (NDI) and quality of life assessed by Nottingham Health Profile (NHP). There were 21 patients in both groups 24 females and 18 males. No correlation was observed between clinical variables and age and duration of disease. So, the conclusion of the study was that no specific effect of traction over standard physiotherapeutic interventions was observed in adults with chronic neck pain and they suggest that the clinicians consider this condition and to focus on exercise therapy in the management of patients suffering from this condition [13].

Material and Methods

The Quasi experimental study was implemented. The setting of study was Rehabilitation centers in Sargodha city. Effects of study were measured in 6 months, from August 1, 2018 to January 31, 2019. The population of study was patients that visited rehabilitation clinics for seeking treatment for neck pain (cervical spondylosis). A sample of 30 patients fulfilling inclusion and exclusion criteria was selected and divided into two groups by "Lottery sampling method". Sample was selected by convenient sample collecting techniques by following inclusion and exclusion criteria.

Inclusion criteria

- Cervical spondylosis
- Both male and female gender
- Age between 20-50 years
- Acute and chronic neck pain

Exclusion criteria

- Traumatic neck pain
- Whiplash injury
- Tumors
- Disc disorder with radiation

Methodology

Study was conducted in population of Sargodha, seeking physiotherapy treatment for neck pain in physiotherapy rehabilitation departments and centers. Study was randomized controlled and multicentered. 30 patients were selected by inclusion and exclusion criteria and were divided randomly into two groups. Group 1 obtained manual intermittent cervical traction. Group 2 obtained sustained cervical traction. Duration of study was 6 months. Intervention was short term (one session only). A baseline measurement was taken on ROM by Goniometer. The post intervention measurement (immediate post intervention & 05 mins after the intervention) was taken on same outcome measurement tools.

Measurement procedure:

Flexion: patient position was sitting with back supported with chair. A manual stabilization was provided to shoulder girdle to prevent movement at thoracic and lumbar region by the therapist hands. Goniometer was placed on external auditory meatus. Proximal arm was placed perpendicular to floor and distal arm with base of nares or parallel to longitudinal axis of tongue depressor [14]. (Figure 1a, 1b)

Extension: patient position was sitting with back supported with chair. A manual stabilization was provided to shoulder girdle to prevent movement at thoracic and lumbar region by the therapist hands. Goniometer was placed on external auditory meatus. Proximal arm was placed perpendicular to floor and distal arm with base of nares or parallel to longitudinal axis of tongue depressor [14]. (Figure 1c, 1d)

Data analysis

Statistical method:

- Discriptive statistical analysis in the form of mean score and standard deviation
- Goniometry was presented in mean percentage and standard deviation.
- Independent T test was used to compare the effects between the groups

Results

Out of 30 patients 27 (90%) patients were with acute neck pain and 3 (10%) were with chronic pain. Majority of patients that visited rehabilitation clinic were found to be suffering from acute neck pain. The graph shows that frequent computer uses and watching TV are the two main activities that aggravate neck pain. (Figure 2)

The graph indicates that REST is the main factor that alleviates the cervical pain, although supine lying also plays role in reducing neck pain. (Figure 3)

Goniometric analysis

Flexion and extension: The analysis shows that there was more improvement in range of motion (flexion and extension) with sustained traction as compared to intermittent traction. Hence it was observed that the sustained cervical traction is more effective in improving ROM in patients suffering neck pain. (Table 1)

Comparison of pre-treatment and post treatment observations for shoulder internal rotation, within groups is summarized in Table 4.Mean score of Group A in pre-treatment measurements was 49.68 ± 5.94 90 and after treatment was 352.76 ± 5.88 (<0.001*) showing significant improvement with intervention of Group A. shoulder internal rotation range in Group B for pre-treatment readings was 49.57 ± 6.99 and in post treatment reading was 55.06 ± 7.47 (<0.001*) showing significant improvement with the interventions of Group B.

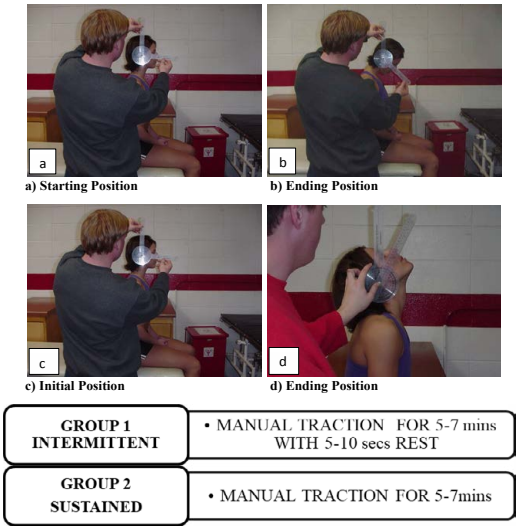

Figure 1: Groups with interventions.

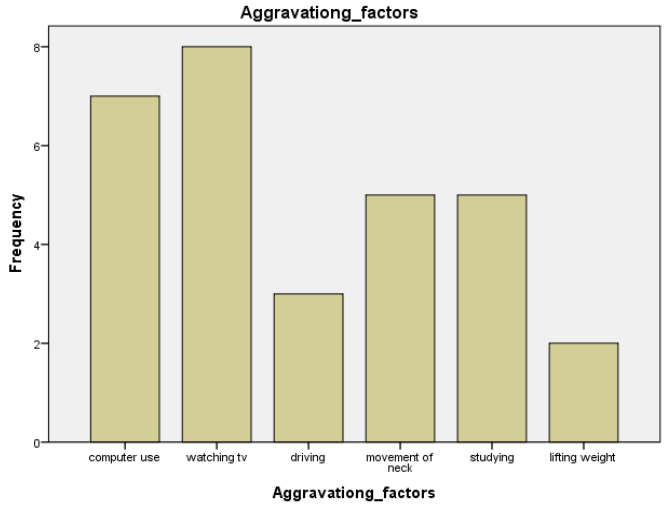

Figure 2: Aggravating Factors.

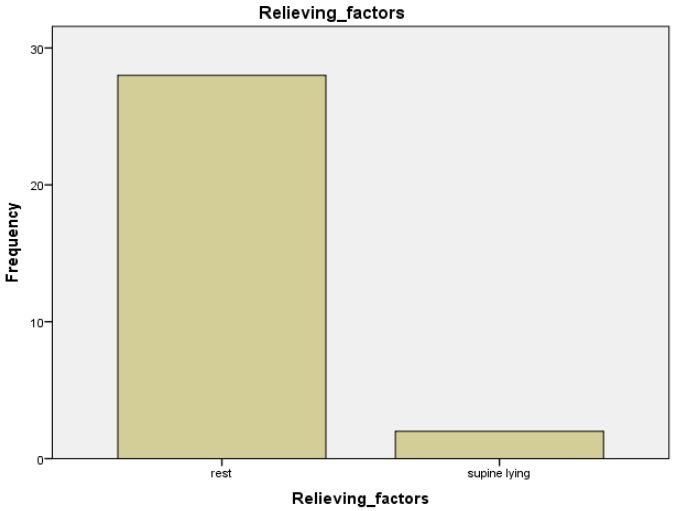

Figure 3: Relieving Factors.

Group		Baseline flexion	Immediate post Intervention flexion	After 5mins intervention flexion	Baseline extension	Immediate post Intervention extension	After 5mins intervention extension
Intermittent	Mean	42.33	43.53	42.33	67.2	68	67.2
	SD	3.77	3.9	3.77	7.94	7.88	7.94
Sustain	Mean	42.66	44.53	44.93	68.4	72.8667	73.9333
	SD	3.26	2.38647	2.28244	7.3	5.35679	5.36479

Table 1: Range of motion (flexion and extension) with sustained traction as compared to intermittent traction.

Discussion

This Study shows that results are not significant when compared the groups between the groups. It is shown in this study that both interventions are significant to reduce the pain when compare with in the groups i.e. pre to post comparison with in groups. It is also found that the effects of intervention are not maintained for 05 minutes of single session of intervention. There is significant improvement in pain in both groups in pre to post score. There is not significant improvement after 05 minutes of interventions in both groups when compared the baseline intervention to 05 minutes of intervention. There was not significant difference in between the groups i.e. intermittent vs. sustained traction groups at post intervention and 05 minutes of intervention.

Another study conducted in 2005, that includes application of strengthning exercise therapy along with manual cervical traction for six months, also showed improvement in pain and function. In comparison, our study gives non-significant results that may be due to single intervention and short-term treatment [12].

Results of this study can be comapred with a research conduced in 2008, that took two groups in which standard physical therapy treatment was compared with combined interventions of standard physical therapy along with cervical traction. This study didn't prove significant for the treatment of chronic pain. Hence, our study is in support of this previous study [13].

In the recent study conducted in 2016 at Shifa international hospital included two groups. Group A received active while group B received passive upper extremity neural mobilization, along with cervical traction. The study concluded that one intervention is not superior to the other which I also in the support of our study conducted in 2019 [15].

Conclusion

Study concluded that results are not significant when compared between the groups. Study also concluded that both interventions are significant to reduce the pain when compare with in the groups i.e. pre to post comparison with in groups. Study also concluded that the effects of intervention are not maintained for 05 minutes of single session of intervention.

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