



Comparison Between Inhibitive Distraction and Intermittent Cervical Traction on Pain and Disability in Patient's With Non-Specific Neck Pain

Authors

Ranjana Dhinwa¹, Shaan-E-Mohd²

¹Researcher Dolphin (PG) Institute of Biomedical & Natural Sciences, Manduwal, Dehradun.

Email: ranjanachodhary@gmail.com

²Professor, Department of Physiotherapy, Dolphin (PG) Institute of Biomedical & Natural Sciences, Manduwala, Dehradun.

Email: Shanthephysio@gmail.com

Abstract

Aim: Aim of this study is to assess and compare the effect of cervical traction or inhibitive distraction on pain and disability in Patient with non-specific neck pain.

Methodology: 27 Patients were randomly selected from the community who volunteered to participate in the study. Patients were randomly assigned in to two interventions: Inhibitive Distraction and Intermittent Cervical Traction. Group A and Group B. Group a received inhibitive distraction with isometric muscle training and Group B received intermittent mechanical cervical traction with isometric muscle training. Both the intervention was given for 4 weeks. Isometric muscle training were given for 5 repetition per session thrice a week , inhibitive distraction were applied for 3 minutes and 5 repetition thrice a week and mechanical cervical traction were applied for 15 minutes, hold and rest time was 8 second for thrice a week.

Outcome measure; Neck Disability Index (NDI) and Visual analog scale (VAS) were collected at before and after intervention.

Results; Patients in all groups improved on the NDI and VAS. When we compared the two groups, we found that intermittent cervical traction was far superior than inhibitive distraction . Significant improvement in neck pain and functional disability ($P \leq 0.05$) also out of inhibitive distraction and intermittent cervical traction, Intermittent Cervical Traction showed better improvement.

Conclusion; It can be concluded from our study that the intermittent cervical traction is better than inhibitive distraction over the neck pain and Functional disability in patients with non-specific neck pain.

Keywords; Non-specific neck pain, neck disability index(NDI), Visual analog scale(VAS)

INTRODUCTION

Neck pain is one of the most common musculoskeletal complaints, which is associated with high socio-economic burden .with 30-50% of the population affected ever year and two out of every three individuals experiencing neck pain in their lifetime .¹Neck pain can be caused by trauma, inflammatory diseases, or degeneration of the spine; however, most patients suffer from simple or non-specific neck pain, which is mainly caused by mechanical factors such as sprain and strains.²Non-specific neck pain is defined as mechanical pain located anywhere between the occiput and upper thoracic spine and surrounding muscles without any specific etiology.³The International Association for the Study of Pain (IASP) has defined neck pain as: "Pain perceived as arising from anywhere within the region bounded superiorly by superior nuchal line, inferior by an unoriginally transverse line through the tip of first thoracic spinous process, and laterally by saggital plane tangential to the lateral border of neck. A frequently seen cause of the neck pain is awkward occupational postures, heavy lifting and physically demanding work .⁴

The etiology of non-specific neck pain is not yet understood in detail, but different factors have been shown to contribute to the development and persistence of neck pain. They do not only include poor posture and high physical load, but also poor psychological health, stress, low socioeconomic status, and smoking. 14% of the patients will suffer from recurrent or persistent pain. If neck pain persists for more than 3 months, it is considered chronic neck pain.³Mechanical traction

for the cervical spine involves a pulling force applied to the neck via a mechanical system which can be applied intermittently or continuously (kisner 1996).The physiological effects of mechanical traction for the cervical spine may include separation of vertebral bodies, movement of facet joints, separation of intervertebral foramen and stretching of soft tissue .⁵Indications for this type of intervention include herniated disc, degenerative disc disease and hypomobile facet joints. Traction has also been reported to decrease pain by providing muscle relaxation, stimulation of mechanoreceptors and inhibition of reflex muscle guarding.⁶ Paris has described a technique called inhibitive distraction (ID) in which the therapist uses the fingertips of both hands to exert a sustained ventrocranial force on the occiput just caudal to the superior nuchal line.⁷Active neck muscle training is an active form of exercise used in physical therapy .it is designed to strengthen muscles .⁸Active neck muscles training programs led to a considerable reduction in average neck pain and disability and improvement in neck function, including neck strength and ROM.⁹

However limited evidence exists to support the effectiveness of using inhibitive distraction as a treatment approach. It was there for a need to compare the effect of intermittent cervical traction or inhibitive distraction on neck pain and functional disability in subjects with non- specific neck pain.

METHODOLOGY

27 Patients were recruited fromKhetan Hospital and Oxford Hospital. Jhunjhunu Rajasthan.on the

basis of inclusion and exclusion criteria. Following subjects in age 18 to 35yrs, Both gender and patients clinically diagnosed with neck pain of duration 1 month. History of neck surgery, Diagnosed Rheumatoid arthritis, Ankylosing spondylitis, Definite or possible long tract signs (eg. Myopathies), Neck pain related to neurological disease and Neck pain related to fracture and dislocation were excluded. Patients were instructed about method and purpose of the study and after that consent form was taken from each patients. Selected patients were randomly divided into 2 groups. Inhibitive distraction (A), intermittent cervical traction (B) groups.

Outcome measure; Two outcome measures NDI, VAS were used to see the effectiveness of the treatment compared to pre intervention values, after 4 weeks of intervention.

Intervention

GROUP – A

Inhibitive distraction: All patients in this group received inhibitive distraction technique for 3 minutes and 5 repetitions thrice a week. For 4 weeks. The patient was asked to rest supine on the treatment table. The fingertips are placed on to



Fig 4.1: Group- A Patient Receiving



Fig 4.2: Group- B Patient Receiving

the sub-occipital musculotendinous structures just caudal to the superior nuchal line and induce a sustained force in a ventrocranial direction, thus exerting compressive forces as well as a distraction to the cervical and sub-occipital structures. The therapist maintained the pressure and the patient's muscles relaxed ideally the pressure was applied at an increasingly deeper level.

GROUP – B

Intermittent cervical traction : All patients in this group received intermittent cervical traction technique for 15 minutes and hold and rest time was 8 second thrice a week. For 4 weeks. Patient lying in supine position head in neutral position. Head halter was applied and adjust the halter to fit the patient comfortably. Attach the halter to the spreader bar of the traction unit, check the patient is aligned for proper pull set the controls and then activate the unit.

Both the groups received isometric neck muscle training included exercises like flexion, extension, side flexion and rotation to the side were performed in 5 repetitions with 10 second hold time per session for 4 weeks.



Fig 4.3 patient performing

isometric

Inhibitive Distraction
intermittent cervical traction
cervical extension

Post intervention

After 4 weeks of intervention, all patients were again assessed on NDI and VAS.

RESULTS

- Data Analysis was done using SPSS 16.0 version.
- Descriptive analysis was done to calculate the mean for age, weight and height of subjects.

Within group analysis:

TABLE: 2.1 WITHIN GROUP ANALYSIS OF NDI andVAS

Groups		MEAN		Sd		t	p
		PRE	POST	PRE	post		
Group A	NDI	16	4.57	3.659	0.938	14.875	.000
	VAS	6.64	1.71	0.633	0.726	69.000	.000
Group B	NDI	20.46	0.85	6.948	1.144	11.587	.000
	VAS	6.85	0.23	0.689	0.439	47.104	.000

Between group analysis:

TABLE 2.2: Between Group Analysis of Ndi

	MEAN		SD		T	p
	GROUP A	GROUP B	GROUP A	GROUP B		
PRE	16	20.46	3.659	6.948	-2.065	.054
POST	4.57	0.85	0.938	1.144	9.286	.000

TABLE 2.3: Between Group Analysis of Vas

	MEAN		SD		t	p
	GROUP A	GROUP B	GROUP A	GROUP B		
PRE	6.64	6.85	0.633	0.689	-.797	.433
POST	1.71	0.23	0.726	0.439	6.361	.000

t-Test showed statistically significant differences in post-therapy mean NDI and VAS. Between groups analysis showed that group B i.e. intermittent cervical traction was better than group A for improving neck pain and decrease functional disability .

DISCUSSION

In our study we tried to compare the effect of inhibitive distraction and intermittent cervical traction in reducing the neck pain and improving functional ability in patient with non- specific neck pain. Two outcome measures NDI and VAS used to see the effectiveness of treatment compared to pre intervention values.

In this study we found that pain was reduced from 1st week of treatment intervention and continued decrease till the 4th week. The decrease was present in the both group. Functional ability was also improved in both groups but a statistically significant difference between the group after 4 week was only seen in intermittent cervical traction group.

Our results show that all the two techniques are effective in improving neck pain and functional

ability. When we compared the both groups, we found that intermittent cervical traction was far superior than inhibitive distraction.

Decrease in pain after intermittent cervical traction be that traction force stimulate the large afferent A- beta fibers (mechanoreceptors) of the muscle and spinal joint. These presynaptically reduce the transmission of pain at a given spinal level. The axial pulling force through the spine causes distraction of the vertebral bodies and thus increases the vertebral foramen, thereby reducing the compression of surrounding nerve, discs, neural tissue and blood vessels. Similarly traction reduces the muscle spasm and increase blood circulation to the affected region of the spine. Chiu et al, 2011 in their randomized control trial observed the effect of intermittent cervical traction and showed same result.¹⁰ Diane U jette et al 1985 in their study that the use of traction to reduce pain and suggested that the rhythmic muscle contraction and relaxation produced by the traction . Increased muscle blood flow reduced pain.¹¹

Lococq's Literature review (Lecocq et al; 2005) stated that cervical traction has several different

modes of action. It has a very small increase in intervertebral space (a few tenths of a millimeter) and a reduction in intra-discal pressure with a possible herniated disc (HD) suction effect. The HD can also be pushed back by tension in the posterior longitudinal ligament. Similarly in case of herniated disc cervical distraction achieved in the cervical vertebrae can probably reduce or remove the impingement on the nerve roots by osteophytic spurs.¹² The mechanism by which intermittent cervical traction reduces neck and arm pain is possibly by unloading the components of the spine by stretching muscles, ligaments. Reducing adhesion within the dural sleeve, nerve root decompression within the central foramina and increasing joint mobility (Subhash Chandra Rai et al 2013).¹³

In the present study we found that inhibitive distraction technique was less effective than intermittent cervical traction. The probable reason for this could be that inhibition distraction includes a combination of direct fascial technique and manual traction. The inhibition technique may have the local rather than the proposed regional effect. Its effect is limited to the specific suboccipital muscles. The another factor could be that during inhibition distraction technique it allows the patient to move in any manner they choose from the treatment table. So, the sustained effect can be decreased as compare to the intermittent cervical traction.^{7,14}

In our study both the group receives isometric neck exercises. These exercises help in reducing pain and improving functional ability.

As per the results we can say either of the treatments can be effective in patients with Non-specific neck pain, However Intermittent cervical traction still prove to be a treatment of choice.

Study Limitation: First limitation is sample size was small in the study. If the number of patients would be more, then the results would be better enhanced. Second limitation is no blinding was done and third limitation is duration of protocol was less.

Conclusion: This study can be concluded that both Inhibitive distraction and intermittent cervical traction have got beneficial effects but intermittent cervical traction had superior in reducing the neck Pain thereby improving the functional ability of the patient with non-specific neck pain.

REFERENCES

1. Janice Cheung¹, Tara Kajaks² and Joy C. MacDermid*,³ The Relationship Between Neck Pain and Physical Activity. The Open Orthopaedics Journal, 2013, 7, (Suppl 4: M11) 521-529.
2. Romy Lauche,¹ Holger Cramer,¹ Claudia Hohmann,¹ Kyung-Eun Choi,¹ Thomas Rampp,¹ Felix Joyonto Saha,¹ et al. The Effect of Traditional Cupping on Pain and Mechanical Thresholds in Patients with Chronic Nonspecific Neck Pain: A Randomized Controlled Pilot Study, Hindawi Publishing Corporation Evidence-Based Complementary and Alternative Medicine Volume 2012, Article ID 429718, 10 pages.

3. Gemmel, H. and Miller, P. 2006. Comparative effectively of manipulation, mobilization and activator instrument in treatment of non-specific neckpain: A systematic review. *Chiropractic and Osteopathy*, 14: 7.
4. Douglas, A. B. and Bope, E. T. 2004. Evaluation and treatment of posterior neck pain in family practice. *Am. Board Fam. Pract.*, 17: S13-22.
5. Graham N, Gross A, Goldsmith CH, Klaber Moffett J, Haines T, Burnie SJ, Pelosop, PMJ. mechanical traction for neck pain with or without radiculopathy. *Cochrane database of systematic review* 2008, issue 3. art no:
6. Nadine Graham BA, BHScPT1, Anita R. Gross, BScPT, MSc1,2, Charlie Goldsmith, PhD1,2 and the Cervical Overview Group. Mechanical Traction For Mechanical Neck Disorders: A Systematic Review, *J Rehabil Med* 2006; 38: 145_/152.
7. Kristín Briem, MHSc, PT, Peter Huijbregts, PT, DPT, OCS, FAAOMPT, FCAMT. Maria Thorsteinsdottir, MSc, PT. Immediate Effects of Inhibitive Distraction on Active Range of Cervical Flexion in Patients with Neck Pain: A Pilot Study, *The Journal of Manual & Manipulative Therapy*, Vol. 15 No. 2 (2007), 82–92.
8. Ylinen, HaKkinen, Takala Et al. Effects of neck muscle training in women with chronic neck pain : One year follow- up Study. *Journal of Strength and conditioning Research*, 2006. 20 (1). 6-13.
9. Takala EP, Nykanen M, Hakkinen A, Malkia E, Pohjlainen T, Ylinen JJ et al. Active neck muscles training in the treatment of chronic neck pain in women.. A Randomized control trial. *JAMA*. 2003 may 21; 289(19):2509.
10. Chiu, T.T., Ng, J.K., Walther-Zhang, B., Lin, R.J.H., Ortelli, L., Kuan, S (2011) A randomized controlled trial on the efficacy of intermittent cervical traction for patients with chronic neck pain. *Clinical Rehabilitation*: 1–9.
11. Diane U Jette, Jeffrey E Falkel and Catherine Trombly. Effect of Intermittent, Supine Cervical Traction on the Myoelectric Activity of the Upper Trapezius Muscle in Subjects with Neck Pain. *PHYS THER*. 1985; 65:1173-1176.
12. Lecocq j, Vautravers, P. & Ribaud.j; 2005. Traction vertebrales. *EMC, Kinesiotherapie-medicine physique-Re adaptation*. pp 206-090-A-10.
13. Subhash Chandra Rai1, Ajith S, I, K.R. Bhagavan2, Deepak Pinto.3 Cervical traction reduces pain and disability in patients with unilateral cervical radiculopathy. *IJCRR*. Vol 05 issue 07 2013.
14. Abhinav et al. The efficacy of inhibitive distraction in subjects with cervical spondylosis, An experimental study. 2013.