

ORIGINAL ARTICLE

The Effects of Spinal Mobilization with and without Manual Traction in Patients with Cervical Radiculopathy

Safdar Shah, Syed Shakil-ur-Rehman, Shakeel Ahmad

ABSTRACT

Objective: To determine the effectiveness of Spinal Mobilization with manual traction on pain and disability in patients with cervical Radiculopathy.

Study Design: Randomized control trial (RCT).

Place and Duration of Study: The study was conducted at Helping Hand for Relief Rehabilitation Centre Mingore Swat from 1st January to 30th June 2014.

Materials and Methods: A total of 40 patients (23 males and 17 females) with mean age 35+8 were randomly selected and placed into two groups A and B. The inclusion criteria was patients with diagnosed cervical radiculopathy on physical examination were included. The Group A was treated with spinal mobilization with manual traction, while group B was treated with spinal mobilization alone for 6 weeks at 3 days per week. The Neck Disability Index (NDI) and Numeric Pain rating Scale (NPRS) were used to measure disability and radiating pain. SPSS version 21 was used for the analysis of data and paired t-test was applied at 95% level of significance to determine the statistical outcomes.

Results: The results of both groups were significant but group of patients treated with the spinal mobilization and traction managed pain (from NPRS mean score 6.2 to 2.5) and disability (from NDI mean score 29.18 to 13.45) more than the group of patients treated with the spinal mobilization alone (Pain from NPRS mean score 6.1 to 3.15 and disability from NDI mean score 30.5 to 18.21). Statistically the group A showed more significant results ($p=0.001$) than group B ($p=0.054$).

Conclusion: It is concluded that Spinal mobilization combined with manual traction is more effective than spinal mobilization alone for the management of radicular pain and disability in patients with cervical radiculopathy.

Keywords: *Spinal Mobilization, Manual Traction, Cervical Radiculopathy.*

Introduction

Cervical radiculopathy is a pain and or sensorimotor deficit syndrome that are defined as being caused by compression of a cervical nerve root. The compression can occur as a result of disc herniation, spondylosis, instability trauma or rarely tumors.¹⁻⁵ Cervical radiculopathy is a substantial cause of disability and morbidity, and is a common condition, affecting both sexes after middle age.^{6,7} Neck pain is a common occurrence and source of disability within the general population with a lifetime incidence as high as 54%. Over one-third of patients with neck pain will develop chronic symptoms lasting more than 6 months, representing a serious health concern. Over 50% of patients with neck pain seen by a general practitioner are referred for physical therapy.⁸ Cervical radiculopathy (CR) is frequently encountered in physical therapy with an annual incidence of 83.2 per 100000 people and there is an

increased prevalence in the fifth decade of life. The prevalence of neck pain in industrialized countries, annual prevalence is situated within 30 to 50% in adult populations. In accordance with these results, in Canada, a bi-annual prevalence of 54% has been reported.⁹ Spinal manipulative therapy includes techniques based on joint manipulation and mobilization, the main difference between each being the amplitude and velocity of the force applied to the vertebra.¹⁰ The mobilization is usually associated with low-velocity rhythmic movements applied in short or large amplitudes, while manipulation involves high-velocity movements applied over small amplitudes. In the past, randomized clinical trials and systematic reviews have shown the efficacy of these techniques on pain relief and function restoration in patients with both chronic and acute specific neck pain.¹¹⁻¹³ Manual techniques developed by Maitland, passive physiologic intervertebral movement (PPIVM) and passive accessory intervertebral movement (PAIVM), are taught by Canadian manual therapy education programs for the assessment of motion between two adjacent spinal segments. There are five grades of mobilization. Mulligan developed Natural Apophyseal Glides (NAG) and Sustained

Correspondence:

Dr. Syed Shakil-ur-Rehman
Principal/Associate Professor
Riphah College of Rehabilitation Sciences (RCRS)
Riphah International University, Islamabad
E-mail: shakil.urrehman@riphah.edu.pk

Natural Apophyseal Glides (SNAG). Cyriax suggested the use of manual spinal traction and compression as pain provocation techniques to help inform clinical judgments about the intervertebral structure at fault.^{14,15} the current study was designed to determine the effectiveness of cervical manual traction with mobilization in the improvement of disability and pain of cervical radiculopathy.

Materials and Methods

This randomized control trial was conducted at Helping Hand for Relief Rehabilitation Centre Mingore Swat from 1st January to 30th June 2014. A total of 40 patients with 23 males and 17 females diagnosed cervical radiculopathy were included in the study. Further diagnosis was made through clinical prediction rules. Patients were randomly placed into two groups. The treatment includes soft tissue manipulation, stretching, mobilization, pain relief modalities (ultrasound, hot and cold therapy) and isometric strengthening exercise program for flexor and extensor muscles.

A written informed consent was taken from all the patients at the start of the treatment program. All the patients were assessed through NDI and NPRS before intervention and at the completion of 6 weeks program. The data of all 40 was analyzed by SPSS-21 and statistical test was applied at 95% level of significance determine the efficacy of both the treatments interventions and compare with each other. Total 40 patients were taken 20 patients in each group (Experimental= Group A, Control = Group B). The NDI and NPRS. Assessment forms were filled from each patient in the first session and baseline score was recorded. Mobilization included unilateral PA (Postero-anterior), Central PA and Transverse glides, these were depends on physical therapist own clinical decision and closely assessing the symptoms with respective mobilization type. Manual traction was given for 10 min with 10 sec traction and 5 sec rest period intermittently up to 10 min.

Results

The results of both groups were significant but group of patients treated with the spinal mobilization and traction managed pain (from NPRS mean score 6.2 to 2.5) and disability (from NDI mean score 29.18 to 13.45) more the group of patients treated with the

spinal mobilization alone (Pain from NPRS mean score 6.1 to 3.15 and disability from NDI mean score 30.5 to 18.21). Statistically the group A showed more significant results (p= 0.001) than group B (p= 0.054).

Table I: pre and post mean and standard deviation pain score on NPRS, mean disability score on NDI and p-values for experimental and control groups. (n= 40)

Groups (n=40) Study Variables	Experimental Group (n=20)		Control Group (n=20)	
	Pre	Post	Pre	Post
Mean and Standard Deviation for Pain on NPRS (0-10)	6.2 ± 2.2	2.5 ± 1.9	6.1 ± 1.8	3.15 ± 2.4
Mean and Standard Deviation for Disability on NDI (0-100)	29.18 ± 12.61	13.45 ± 12.31	30.5 ± 9.4	18.21 ± 10.2
P-values	P=0.001		P=0.054	

Discussion

The results of this study demonstrated that Maitland's mobilization followed with manual traction is more effective than mobilization alone. There are a variety of methods of giving traction which include Intermittent Mechanical Traction, Sustained Mechanical Traction, Intermittent Manual Traction, Sustained Manual Traction, further more these tractions are given in either sitting or supine position but most of the clinician preferred to use intermittent type of traction due to favorable results as compared to sustained type of traction. Bronfort and team conducted a randomized control trial to determine the relative efficacy of spinal manipulation therapy (SMT), medication, and home exercise with advice (HEA) for acute and sub-acute neck pain in both the short and long term. They concluded that for participants with acute and sub acute neck pain, SMT was more effective than medication in both the short and long term. However, a few instructional sessions of HEA resulted in similar outcomes at most time points.¹⁶ Slaven and colleagues found that multiple studies provided evidence that a single session of joint mobilization can lead to a reduction of self-reported pain at rest and self-reported pain with the most painful movement.¹⁷ Although surgery remains one treatment option, various authors have suggested nonsurgical approaches, including cervical traction,

and manual therapies, including HVLA manipulation, among others. The efficacy and safety of HVLA in the treatment of these patients are still controversial, and there are reported cases in the literature of serious sequelae from cervical spine manipulation. But with combination with traction and other manual therapies it gives great relief to sign and symptoms. The limitations of our study were small sample size and short period of time. It is recommended to replicate this study with large sample size, increase time period, and more tolls.¹⁸ Another study conducted by Ali and colloquies conducted on patients with non-specific neck pain concluded that Sustained Natural Apophyseal Glides (SNAGs) manual physical therapy techniques combined with Isometric Exercise training program (IETP) was more effective in reduction of pain and enhancement of function, as compared to those patients treated with SNAGs manual physical therapy techniques alone.¹⁹

Conclusion

It is concluded that Spinal mobilization combined with manual traction is more effective than spinal mobilization alone for the management of radicular pain and disability in patients with cervical radiculopathy.

REFERENCES

1. Caridi JM, Pumberger M, Hughes AP. Cervical radiculopathy: a review. *HSS Journal*. 2011; 7: 265-72.
2. Crette S, Fehlings MG. Cervical radiculopathy. *New England Journal of Medicine*. 2005; 353: 392-9.
3. Ellenberg MR, Honet JC, Treanor WJ. Cervical radiculopathy. *Archives of physical medicine and rehabilitation*. 1994; 75: 342-52.
4. Fouyas IP, Statham PF, Sandercock PA. Cochrane review on the role of surgery in cervical spondylotic radiculomyelopathy. *Spine*. 2002; 27: 736-47.
5. Humphreys SC, Chase J, Patwardhan A, Shuster J, Lamasery L, Hodges SD. Flexion and traction effect on C5-C6 foraminal space. *Archives of physical medicine and rehabilitation*. 1998; 79: 1105-9.
6. Albeck MJ. A critical assessment of clinical diagnosis of disc herniation in patients with monoradicular sciatica. *Acta neurochirurgica* 1996; 138: 40-4.
7. Sadil VF. Maitland's Vertebral Manipulation. Focus on Alternative and Complementary Therapies. 2002; 7: 70.
8. Boyles R, Toy P, Mellon JJ, Hayes M, Hammer B. Effectiveness of manual physical therapy in the treatment of cervical radiculopathy: a systematic review. *Journal of Manual & Manipulative Therapy*. 2011; 19: 135-12.
9. Chiradejnant A, Maher CG, Latimer J, Stepkovitch N. Efficacy of "therapist-selected" versus "randomly selected" mobilisation techniques for the treatment of low back pain: a randomised controlled trial. *Australian Journal of Physiotherapy*. 2003; 49: 233-41.
10. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. *The spine journal*. 2004; 4: 335-56.
11. Childs JD, Fritz JM, Flynn TW, Irrgang JJ, Johnson KK, Majkowsky GR, et al. A clinical prediction rule to identify patients with low back pain most likely to benefit from spinal manipulation: a validation study. *Annals of internal medicine*. 2004; 141: 920-8.
12. Hoving JL, Koes BW, de Vet HC, van der Windt DA, Assendelft WJ, van Mameren, et al. Manual therapy, physical therapy, or continued care by a general practitioner for patients with neck pain: a randomized, controlled trial. *Annals of Internal Medicine*. 2002; 136: 713-22.
13. Hurwitz EL, Aker PD, Adams AH, Meeker WC, Shekelle P. Manipulation and mobilization of the cervical spine: a systematic review of the literature. *Spine*. 1996; 21: 1746-59.
14. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. *American Journal of Public Health*. 2002; 92: 1634-41.
15. Korthals-de Bos IB, Müllner M, Hoving JL, van Tulder MW, Rutten-van Mölken MP. Cost effectiveness of physiotherapy, manual therapy, and general practitioner care for neck pain: economic evaluation alongside a randomised controlled trial Commentary: Bootstrapping simplifies appreciation of statistical inferences. *BMJ*. 2003; 326: 911-4.
16. Cleland JA, Childs MJD, McRae M, Palmer JA, Stowell, T. Immediate effects of thoracic manipulation in patients with neck pain: a randomized clinical trial. *Manual therapy*. 2005; 10: 127-35.
17. Kanlayanaphotporn R, Chiradejnant A, Vachalathiti, R. Immediate effects of the central posteroanterior mobilization technique on pain and range of motion in patients with mechanical neck pain. *Disability & Rehabilitation*. 2010; 32: 622-28.
18. Kanlayanaphotporn R, Chiradejnant A, Vachalathiti, R. The immediate effects of mobilization technique on pain and range of motion in patients presenting with unilateral neck pain: a randomized controlled trial. *Archives of physical medicine and rehabilitation*. 2009; 90: 187-92.
19. Ali A, Shakil-ur-Rehman S, Sibtain F. The efficacy of sustained natural apophyseal glides with and without isometric exercise training in non-specific neck pain. *Pakistan journal of medical sciences* 2014; 30: 872-4.