



A COMPARATIVE STUDY ON THE EFFECTIVENESS OF CERVICAL TRACTION WITH INTERFERENTIAL THERAPY VERSUS CERVICAL TRACTION WITH INTERFERENTIAL THERAPY AND NEURAL MOBILISATION IN CERVICAL RADICULOPATHY

Physiotherapy

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ABSTRACT

Background: cervical radiculopathy is a disease process marked by the nerve compression from herniated disc material or arthritic bone spur. It has been reported that cervical radiculopathy has an annual incidence of 107.3 per 100,000 for man and 63.5 per 100,000 for women with a peak at 50-64 years of age. **Method:** This study is the quasi experimental study carried out in Adhiparasakthi hospitals melmaruvathur 40 subjects with cervical radiculopathy between the age group of 25-65 years were randomly selected and divided into two groups. Group A patients were received cervical traction and interferential therapy Group B received cervical traction, interferential therapy along with the neural mobilization for 1 week. Neck pain, cervical functions were assessed using visual analog scale and neck disability index. Based on pre and post test scores data was analysed and results were interpret. **Result:** By comparing the data of group A and group B showed significance improved in the neck function and pain reduction of P value of 0.001 **Conclusion:** this study has been concluded that group B received conventional physiotherapy with neural mobilization is markedly effective in improving neck function & pain reduction than group A.

KEYWORDS

Neural mobilization, Neck disability index, cervical radiculopathy, Herniated disc, Arthritic bone spur.

INTRODUCTION

- Cervical radiculopathy is the clinical description of when a nerve root in the cervical spine becomes inflamed or damaged, resulting in a change in neurological function. [1]
- Neurological deficits such as numbness, altered reflexes, or weakness, may radiate anywhere from the neck into the shoulder, arm, hand, or fingers. [2]
- Pins and needles or tingling sensation which can range from achy to shock-like or burning, may also radiate down into the arm and hand. It can be tested manually by means of Spurling test, Upper limb tension test.

Neurodynamics refers to the communication between different parts of the nervous system and to the nervous systems relationship to the musculoskeletal system. It has been shown that the nerves move independently from other tissues. The term Neurodynamics first made an appearance in 1989 and has since been further developed over the last 30 years. Neurodynamics is now seen as an important part of injury assessment and treatment. Neurodynamics in the sense implied here is the mobilisation of the nervous system as an approach to physical treatment of pain. The treatment and or assessment relies on influencing pain physiology via the mechanical treatment of neural tissues and non-neural structures surrounding the nervous system. This mobilisation activates a range of mechanical and physiological responses in nervous tissues. eg neural sliding, pressurisation, elongation, tension and changes in intraneural microcirculation, axonal transport and nervous impulse movements. Neural mobilization to treat neurodynamic dysfunction to date is still needing justification through research of high quality homogenous studies. To date however most studies have shown positive therapeutic effects through the use of neurodynamic treatment. [3]

Basic Principles Of Neural Mobilisation

Once the decision to mobilize the nervous system has been made, the actual treatment delivered can be chosen by relying on two main considerations:

- The Maitland concept. That is, the treatment of the signs and symptoms based on the severity, irritability and nature of the disorder. Consideration of these factors is a basic tenet of the Maitland concept. In this regard, treatment via nervous system mobilisation is no different from the method espoused by Maitland for a joint. The clinical will easily embrace treatments other than joint mobilisation. [4]
- Expansion of thoughts on, and the use of 'nature' 'Nature' is a term used by Maitland (1986) but is more widely understood as pathology. With clinical reasoning processes, up to date pathological knowledge would be included and assessed by the process itself. [5] Thoughts regarding pathology should include the site (s) of altered nervous system mechanics, the tissues of the nervous system involved and possible structures around and along the nervous system which could interfere with its normal mechanics. [6] Other thoughts could include the proportion of

altered mechanics with altered physiology. Already, so much is known about the nervous system, and it must be included in treatment decisions. One important key to successful treatment if for the physiotherapist to think of mobilisation rather than stretch. If one thinks of all that mobilisation entails – an appreciation of resistance encountered, symptoms felt and their relationship during movement, the place of gentle and strong treatment, and the reassessment essentials – it can be seen that all of these aspects are just as applicable to nervous system mobilisation as they are, say, to joint mobilisation. We can do much better than just crudely stretching the nervous system. [7]

MATERIALS AND METHODS

Treatment Procedure

All subjects were given verbal instructions for the procedure and consent form was obtained from each one of them, prior to participation in the study.

Subjects were assessed for cervical radiculopathy condition. Visual analog scale and neck disability index score were measured in each and every patient.

Treatment Protocol

Testing procedure and intervention:

GROUP A

- In this, subject was treated cervical traction and interferential therapy for cervical radiculopathy. Intermittent cervical traction for 15mins duration followed by 40 sec hold and 5 sec rest and interferential therapy for 15mins.

GROUP B

- In this subject was treated cervical traction, interferential therapy and neural mobilisation for cervical radiculopathy. Intermittent cervical traction for 15mins duration followed by 40 sec hold and 5 sec rest and interferential therapy for 15mins along with neural mobilisation for 15 minutes.

Treatment

Intermittent Cervical Traction:

Patient Position: Supine lying.

Therapist Position: Stand at the side of the patient.

Procedure

The therapist has to explain the procedure to the patient and check for any contraindications after getting the informed consent from the patient. Position the patient and set the treatment parameters with HOLD TIME-40 sec, REST TIME-5 sec, LOAD-1/8th of the body weight, DURATION-15mins

Interferential Therapy:

Patient Position: Supine lying or forward leaning sitting

Therapist Position: Stand at the side of the patient

Procedure

The therapist has to explain the procedure to the patient and check for any contraindication. Position the patient and set the parameters, BASE-90HZ, SPECTRUM-50HZ, DURATION-15mins.[8]

Neural Mobilisation:

Patient Position: Supine lying or chair sitting

Therapist Position: Stand at the side of the patient

Procedure

The therapist has to explain about the treatment to the patient and check for any contraindication.

After that the therapist has to perform upper limb tension test to check the involved nerve.

For median nerve the therapist has to passively perform shoulder stabilization followed by shoulder abduction with external rotation,

forearm supination wrist and finger extension. Then gentle side flexion of the neck to opposite side and slowly release the wrist extension (to identify structural differentiation).

For radial nerve the therapist has to passively perform shoulder girdle depression followed by shoulder abduction with internal rotation, forearm pronation wrist and finger flexion. Then gentle side flexion of the neck to opposite side and slowly release the wrist flexion and shoulder depression (to identify structural differentiation).

For ulnar nerve the therapist has to passively perform shoulder girdle depression followed by shoulder abduction with external rotation, forearm pronation wrist and finger extension. Then gentle side flexion of the neck to opposite side and slowly release the wrist extension and shoulder depression (to identify structural differentiation).[9]

Data Analysis

Paired Samples Statistics					
Neck Disability Index Group-A		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest	38.4000	20	4.44143	.99313
	Posttest	21.9500	20	3.54631	.79298

Paired Samples Test									
Neck Disability Index Group-A		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pretest - Posttest	16.450	6.68443	1.49468	13.32159	19.57841	11.006	19	.000

Paired Samples Statistics					
Visual Analog Scale Group-A		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest	7.6000	20	.94032	.21026
	Posttest	4.1000	20	.78807	.17622

Paired Samples Test									
Visual Analog Scale Group-A		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pretest - Posttest	3.50000	.94591	.21151	3.05730	3.94270	16.548	19	.000

Paired Samples Statistics					
Neck Disability Index Group-B		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest	38.8000	20	6.84874	1.53143
	Posttest	9.5000	20	2.41704	.54047

Paired Samples Test									
Neck Disability Index Group-B		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pretest - Posttest	29.300	7.84790	1.75484	25.62707	32.97293	16.697	19	.000

Paired Samples Statistics					
Visual Analog Scale Group-B		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest	7.4500	20	.94451	.21120
	Posttest	2.3000	20	.47016	.10513

Paired Samples Test						t	df	Sig. (2-tailed)	
Visual Analog Scale Group-B		Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
Pair 1	Pretest - Posttest	5.1500	.87509	.19568	Lower	Upper	26.319	19	.000
					4.74044	5.55956			

Group Statistics					
Neck Disability Index Pretest Group-A Vs Group-B		N	Mean	Std. Deviation	Std. Error Mean
Pretest	Pretest Group-A	20	38.4000	4.44143	.99313
	Pretest Group-B	20	38.8000	6.84874	1.53143

Independent Samples Test										
Neck Disability Index Pretest Group-A Vs Group-B		Levene's Test for Equality of Variances		t-test for Equality of Means						
				F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
		Lower	Upper							
Pretest	Equal variances assumed	4.496	.041	-.219	38	.828	-.40000	1.82526	-4.09505	3.29505
	Equal variances not assumed			-.219	32.579	.828	-.40000	1.82526	-4.11534	3.31534

Group Statistics					
Neck Disability Index Posttest Group-A Vs Group-B		N	Mean	Std. Deviation	Std. Error Mean
Posttest	Posttest Group-A	20	21.9500	3.54631	.79298
	Posttest Group-B	20	9.5000	2.41704	.54047

Independent Samples Test										
Neck Disability Index Posttest Group-A Vs Group-B		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Post test	Equal variances assumed	3.806	.058	12.974	38	.000	12.45000	.95965	10.50730	14.3927
	Equal variances not assumed			12.974	33.519	.000	12.45000	.95965	10.49873	14.4012
Group Statistics										
Visual Analog Scale Pretest Group-A Vs Group-B					N	Mean	Std. Deviation	Std. Error Mean		
Pretest		Pretest Group-A			20	7.6000	.94032	.21026		
		Pretest Group-B			20	7.4500	.94451	.21120		
Independent Samples Test										
Visual Analog Scale Pretest Group-A Vs Group-B		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Pretest	Equal variances assumed	.028	.869	.503	38	.618	.15000	.29802	-.45331	.75331
	Equal variances not assumed			.503	37.99	.618	.15000	.29802	-.45331	.75331
Group Statistics										
Visual Analog Scale Posttest Group-A Vs Group-B					N	Mean	Std. Deviation	Std. Error Mean		
Posttest		Posttest Group-A			20	4.1000	.78807	.17622		
		Posttest Group-B			20	2.3000	.47016	.10513		
Independent Samples Test										
Visual Analog Scale Posttest Group-A Vs Group-B		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Posttest	Equal variances assumed	1.000	.324	8.772	38	.000	1.80000	.20520	1.38460	2.21540
	Equal variances not assumed			8.772	31.00	.000	1.80000	.20520	1.38150	2.21850

RESULT

The baseline assessment criteria for the study was visual analog scale and Neck disability index. The pre test and the post test values of the subjects were obtained. Based on numerical values the interpretation of visual analog scale and neck disability index was made with statistical analysis.

Based on the statistical analysis GROUP B shows better statistical significance in pain reduction mean values as compared to GROUP A.

CONCLUSION

This conclude that cervical traction with interferential therapy along with neural mobilization is beneficial when compare to cervical traction and interferential therapy.

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