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EFFECT OF SPINAL MOBILIZATION WITH ARM MOVEMENT IN THE TREATMENT OF CERVICOBRACHIAL PAIN SYNDROME

[1,*]Dr. Dhruv Taneja, [2]Dr. Ajeet Saharan and [3]Dr. Manoj Kumar Mathur

[1]MPT (Ortho & Sports), Assistant Professor, Dept of Physiotherapy,
Maharaj Vinayak Global University, Jaipur 302028
[2]MPT (Neuro), PhD, Assistant Professor, Dept of Physiotherapy, Maharaj Vinayak Global University, Jaipur
[3]MPT (Musculoskeletal), Assistant Professor, Dept of Physiotherapy,
Maharaj Vinayak Global University, Jaipur, 302028

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ABSTRACT

Study Objectives: To Evaluate the effect of Spinal Mobilization with Arm Movement (SMWAM) and compare its effectiveness with conventional therapy in the treatment of Cervicobrachial pain syndrome.
Design: Experimental study.
Setting: Subjects were taken from different hospitals and physiotherapy clinics in Bengaluru.
Methods: Informed consent will be obtained from the subjects. The total duration of the study was for 4 weeks. The treatment session was of 3 days per week for the total 4 weeks. i.e. 12 sessions. Patients referred by the doctor with diagnosis of Cervicobrachial pain syndrome of both sex and who fulfill the inclusion criteria were included in the study. 30 subjects were included in the study and were randomly allocated into two groups with 15 subjects in each group. Group A (Experimental group) includes 15 subjects and was given Hot Packs for 15 minutes with 3 sets of Spinal Mobilization with Arm Movement(1 set contains 7 glides). Group B (Control group) includes 15 subjects and was given Hot Packs for 15 minutes and cervical traction for 10 minutes. The tension of the traction was kept as 1/8th of the body weight of the subject with 20 seconds of hold time and 5 seconds of rest time.
Measure: Neck disability index
Visual analogue scale, Range of motion.
Result: Comparison of V.A.S in group A was strongly significant (P=0.001) and was moderately significant in group B (0.010) with percentage change of 28.45% in group A and 12.06% in group B. Comparison of cervical range of motion in group A was strongly significant when compared to group B. Neck Disability Index scores was strongly significant with P=0.001 in group A when compared to a moderately significant P=0.017 in group B.
Conclusion: The results suggest that Spinal Mobilization with Arm Movement results in significantly reducing the pain and disability and enhances the cervical range of motion than conventional therapy in subjects with Cervicobrachial pain syndrome.

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INTRODUCTION

The term Cervicobrachial pain syndrome has recently been coined to describe upper quarter pain in which neural tissue sensitivity to mechanical stimuli is a primary feature. Upper quarter pain includes pain perceived in neck, shoulder, arm, upper back and/or upper chest region with or without associated headache (Deepti Chhabra, 2008; Allison, 2002).

Corresponding author: **Dr. Dhruv Taneja,**
MPT (Ortho & Sports), Assistant Professor, Dept of Physiotherapy,
Maharaj Vinayak Global University, Jaipur 302028.

It has been suggested that enhanced mechanosensitivity of the upper limb peripheral nerve trunks may contribute to the pathology of CBPS (Deepti Chhabra, 2008; Cowell, 2002). Certain clinical provocation tests have been employed as a means of identifying neural tissue involvement in these patients. Much of the early justification for suggesting that neural tissue contributed to upper quarter neuropathic pain disorders, such as CBPS, was on the presence of a 'positive' response from a single provocation test procedure (Cowell, 2002). Diagnosis of CBPS is based on clinical examination. Few, if any, medical investigative tests are definitive in the

diagnosis of Cervicobrachial pain syndrome. Overt neurological deficit is not necessarily present. However, a number of physical signs are assessed to determine involvement of neural tissue. These include: (i) Active movement dysfunction; (ii) Passive movement dysfunction (iii) Adverse responses to neural tissue provocation tests; (iv) Hyperalgesic responses to palpation of nerve trunks; (v) Hyperalgesic responses to palpation of related cutaneous tissues and (vi) Evidence of a related local area of pathology. Each of these physical signs needs to be consistent with the other clinical signs and the symptoms of the patient to reflect a significant neural component in the condition.[2]

METHODOLOGY

It's an Experimental study.Subjects were taken from different hospitals and physiotherapy clinics in Bengaluru. Informed consent were obtained from the subjects. Total 30 subjects were taken having Cervicobrachial pain syndrome of both sex and who fulfill the inclusion criteria were included in the study. The total duration of the study was for 4 weeks. The treatment session was of 3 days per week for the total 4 weeks. (12 sessions). Subjects were included in the study and were randomly allocated into two groups with 15 subjects in each group.

Group A: (Experimental group) includes 15 subjects and was given Hot Packs for 15 minutes with 3 sets of Spinal Mobilization with Arm Movement(1 set contains 7 glides).

Group B: (Control group) includes 15 subjects and was given Hot Packs for 15 minutes and cervical traction for 10 minutes. The tension of the traction was kept as 1/8th of the body weight of the subject with 20 seconds of hold time and 5 seconds of rest time. A Pre treatment Neck Disability Index, Visual Analogue Scale and Range of Motion were assessed on the 1st Day of the of treatment and A Post treatment Neck Disability Index, Visual Analogue Scale and Range of Motion were assessed on the end of the last day of the 4th week of the treatment in order to evaluate Cervicobrachial pain. Active cervical spine range of motion (flexion, extension, bilateral side-bending and cervical rotation) is measured using a universal goniometer which has been shown to be a valid and reliable tool for the measurement of cervical range of motion in the sagittal, frontal plane and transverse plane.

Moist heat therapy Position of subject:- Subjects will be supine lying on examination table.

Procedure:- Each subject received hot packs for 15 minutes. Cervical traction Position of subject:- Subjects will be in supine lying while the therapist will place the traction collar firmly to the cervical region of the patient with the upper limbs of the patient resting at the side with pillows under the knee. Each subject will receive intermittent traction for 10 minutes in the treatment session. Tension of the cervical traction will be kept at 1/8th of the patient's body weight. A hold time of 20 seconds and rest time of 5 seconds was kept for the subjects.

Spinal Mobilization with Arm Movement: Mobilization should be performed depending upon the side of involvement, when he/she horizontally adducts the shoulder. 3 sets will be performed overall for the treatment purpose. 7 glides with respective arm movements will be given in 1 set of treatment. Therapist stands behind the seated patient. Cervical spine mobilization should be given depending upon the distribution of pain and symptoms. Because of the pain distribution say (cervical 5) on the right side, initially place the medial border of left thumb, on the right side of the spinous process of the 4th cervical vertebrae. Place right thumb of other hand on the other border on left thumb. Outer thumb pushes on its partner to move the spinous process across to the left and sustain this rotation as the patient horizontally adducts his right arm. Try to make as much contact with the spinous process as your thumb will allow, and not just the bifid tip which will hurt. 2 more sets of this pain free spinal mobilization with arm movement would be undertaken. But if the patient symptoms persists on abduction and this is the offending movement then the therapist places the thumb on spinous process which is reinforced by the index finger. The glide in the chosen direction must not be released until the patient's arm returns to the starting position. This is a very important rule for the technique.

Data analysis

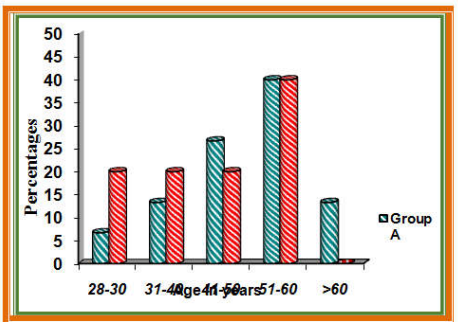
Descriptive statistical analysis has been carried out in the present study. Results on continuous measurements are presented on Mean ± SD (Min-Max) and results on categorical measurements are presented in Number (%). Significance is assessed at 5% level of significance. Mann Whitney U test has been used to find the significance of study variables between two groups and Wilcoxon Signed Rank test has been used to find the significance of study variables in Pre and Post. The Statistical software namely SPSS15.0, Stata 8.0, MedCalc 9.0.1 and Systat 11.0 were used for the analysis of the data and Microsoft Word and Excel have been used to generate graphs, tables etc.

RESULTS

Table 1. Comparison of age distribution of patients studied

Age in years	Group A		Group B	
	No	%	No	%
28-30	1	6.7	3	20.0
31-40	2	13.3	3	20.0
41-50	4	26.7	3	20.0
51-60	6	40.0	6	40.0
>60	2	13.3	0	0.0
Total	15	100.0	15	100.00
Mean ± SD	48.73±10.59		43.13±11.61	

Samples are age matched with P=0.178

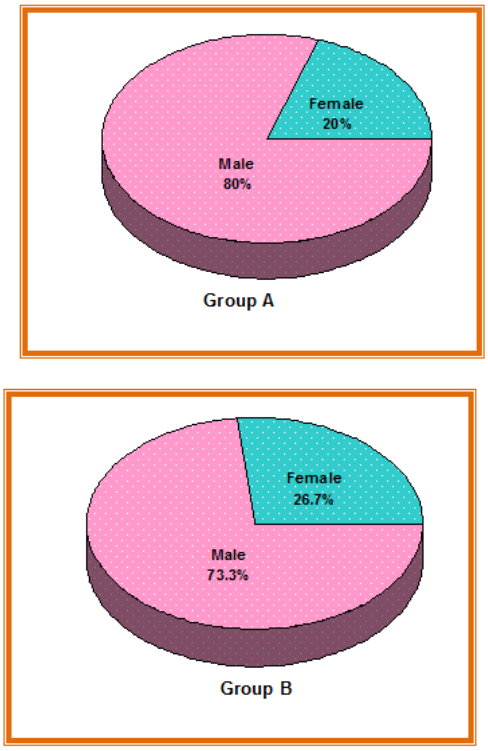


Graph 1.

Table 2. Gender distribution of patients studied

Gender	Group A		Group B	
	No	%	No	%
Male	12	80.0	11	73.3
Female	3	20.0	4	26.7
Total	15	100.0	15	100.00

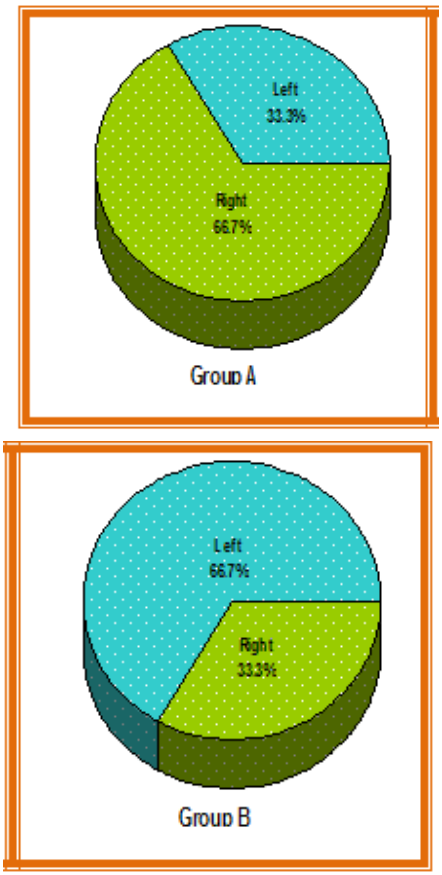
Samples are gender matched with p=1.000



Graph 2.

Table 3. Side involved (P=0.068+)

Side involved	Group A		Group B	
	No	%	No	%
Right	10	66.7	5	33.3
Left	5	33.3	10	66.7
Total	15	100.0	15	100.00



Graph 3

Table 4. Comparison of Cervical Range of Motion in Degree

Cervical Range of Motion	Pre/Post	Group A	Group B	P value
Flexion	Pre	66.06±10.23	62.33±9.96	0.137
	Post	68.53±10.13	63.40±10.55	0.148
	% change	3.7%	1.7%	-
	P value	0.003**	0.011*	-
Extension	Pre	56.40±8.40	54.47±10.14	0.624
	Post	58.53±8.92	55.46±10.27	0.345
	% change	3.8%	1.8%	-
	P value	0.001**	0.026*	-
Lateral Flexion-Right	Pre	22.20±6.44	25.07±7.55	0.345
	Post	24.67±6.90	25.87±7.68	0.595
	% change	11.1%	3.19%	-
	P value	0.003**	0.041*	-
Lateral Flexion-Left	Pre	28.40±9.10	21.80±4.88	0.013*
	Post	30.33±9.24	22.73±5.36	0.005**
	% change	6.79%	4.27%	-
	P value	0.001**	0.008**	-
Cervical rotation-right	Pre	53.60±5.99	55.40±5.63	0.412
	Post	55.60±5.99	55.93±5.62	0.775
	% change	3.73%	0.95%	-
	P value	0.001**	0.023*	-
Cervical rotation –left	Pre	55.86±6.73	53.87±5.61	0.567
	Post	57.20±6.54	54.53±6.69	0.367
	% change	2.38%	1.2%	-
	P value	0.001**	0.014*	-

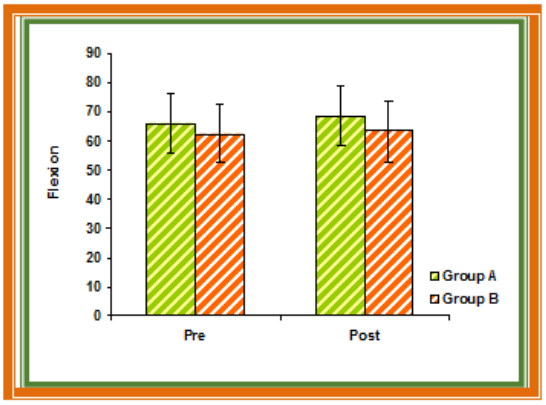
Interpretation of result

Comparison of V.A.S in group A was strongly significant (P=0.001) and was moderately significant in group B (0.010) with percentage change of 28.45% in group A and 12.06% in group B. Comparison of cervical range of motion in group A was strongly significant when compared to group B. Neck Disability Index scores was strongly significant with P=0.001 in group A when compared to a moderately significant P=0.017 in group B.

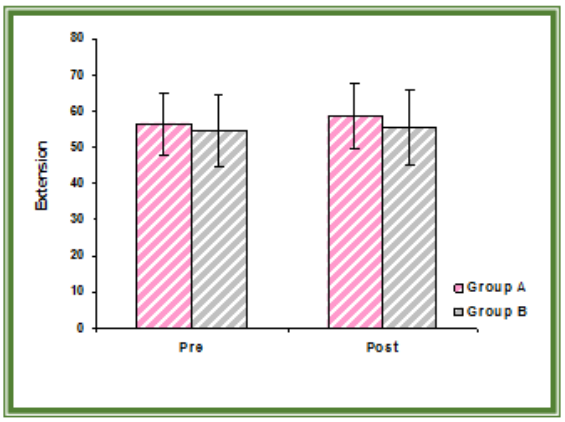
DISCUSSION

The purpose of the study was to evaluate the effect of Spinal Mobilization with Arm Movement in the treatment of Cervicobrachial pain syndrome. An Experimental study with 30 patients experiencing Cervicobrachial pain for greater than 3 months were randomly assigned into two groups with 15 patients in Group A (Hot packs and Spinal mobilization with arm movement was given) and 15 patients in Group B (Hot packs and Cervical traction was given). The results of the study showed a highly significant increase in the cervical range of motion (flexion, extension, lateral flexion and cervical rotation) in the experimental group when compared to the control group which showed a moderately significant increase in the cervical range of motion.

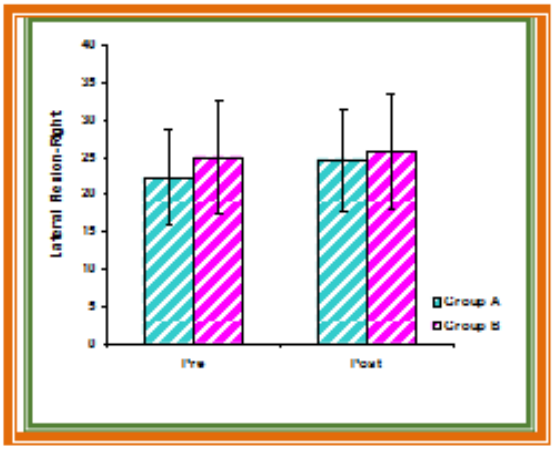
The results also showed 28.23% change in the experimental group when compared to the control group which showed a change of 5.69% in the N.D.I scores. The results of the study showed a highly significant change in the V.A.S scores in the experimental group when compared to the control group which showed a moderately significant change in the V.A.S scores. The cervical range of motion had a highly significant increase in the experimental group. The possible mechanisms for this increase may be due to the reason that the SMWAM may have caused stimulation of joint receptors via passive mobilisations would have had an reflex effect on segmental muscle activity and thus increased the cervical range of motion. This finding was in accordance with the studies done by (Thabe 1986;



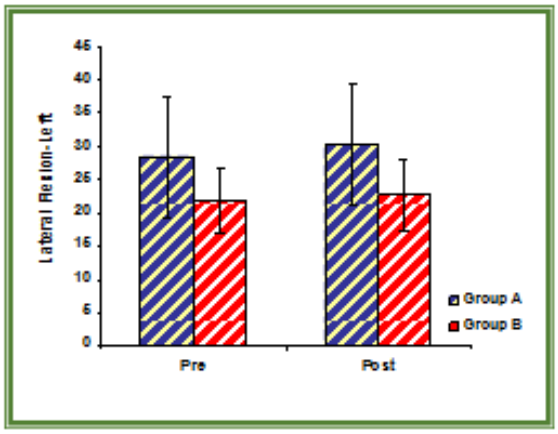
Graph 4 (a)



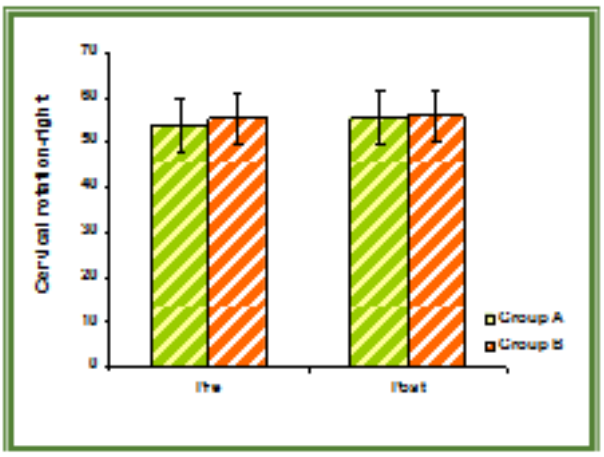
Graph 4 (b)



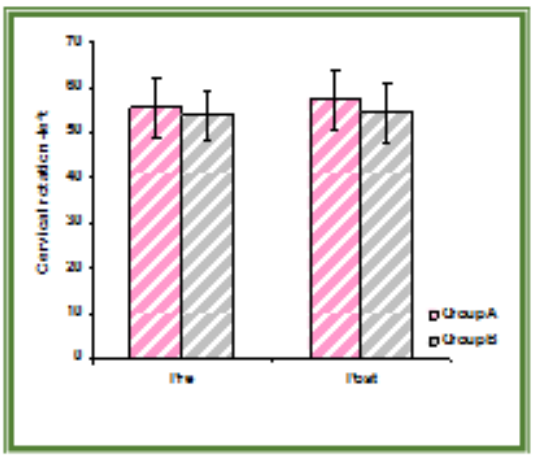
Graph 4 (c)



Graph 4 (d)



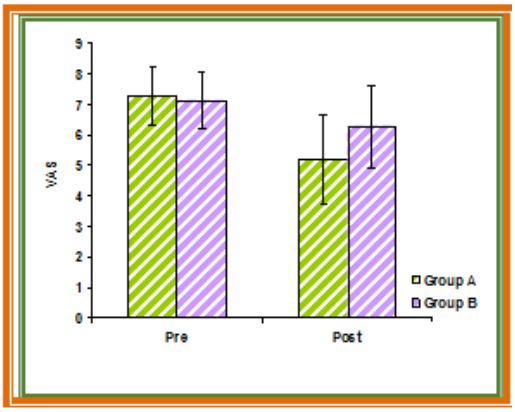
Graph 4 (e)



Graph 4 (f)

Table 5: Comparison of VAS score

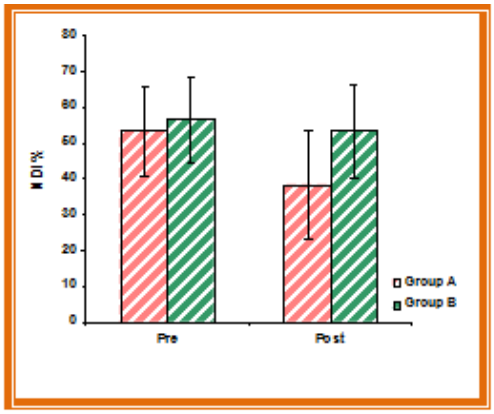
VAS	Group A	Group B	P value
Pre	7.27±0.96	7.13±0.92	0.742
Post	5.20±1.47	6.27±1.33	0.057+
% change	28.45%	12.06%	-
P value	0.001**	0.010*	-



Graph 5.

Table 6: Comparison of Neck disability Index

NDI %	Group A	Group B	P value
Pre	53.33±12.75	56.55±12.19	0.595
Post	38.27±14.96	53.33±13.17	0.013*
% change	28.23%	5.69%	-
P value	0.001**	0.017*	-



Graph 6.

Taylor et al. 1994; Murphy et al.1995) who demonstrated similar effects on segmental muscle activity after passive mobilization or manipulations (Thabe, 1986; Taylor et al., 1994; Murphy et al., 1995). SMWAM may have also corrected the joint positional fault which may have in turn increase the cervical range of motion. SMWAM may have caused changes in the internal microcirculation and axonal transport which may have reduced the segmental dysfunction thus improving the R.O.M. (Lundborg G) (Lundborg, 1988). SMWAM may have caused decrease in the excitability of the spinal neurones that link sensory afferent pathways with motor neurones (Cook et al. 1986) which may have normalised the altered muscle activity thus increasing the cervical R.O.M (Cook, 1986). The N.D.I scores also showed a highly significant change in the experimental group. This could be due to the reason that SMWAM may also have caused a rapid hypoalgesic effect, a centrally mediated neurophysiological mechanism resulting from activation of a descending pain inhibitory system (Wright 1995) (Wright, 1995). This finding was in accordance with a study done by Deepti Chhabra et al which reported a similar change in the N.D.I scores following lateral cervical glide mobilization in Cervicobrachial pain syndrome. As discussed above, the cervical range of motion also increased which may had an impact on the N.D.I scores. The V.A.S scores also showed a highly significant change in the experimental group. SMWAM may have caused a reduction in the sustained nociceptive barrage (Sugimoto et al. 1989). SMWAM may have caused reducing mechanical forces on nerves, dispersing irritating chemicals and fluids in and around nerves and neurons, enhancing vascularity and stretching scar tissue (Deepti Chhabra et al). SMWAM may also have caused reduction in the oedematous inflammatory nature of the nerve root complex by restoring the normal pressure gradients, existing between the extra- and intra- funicular elements of the nerve roots within the intervertebral foramen (Sunderland 1978).

Conclusion

Purpose of the study was to evaluate the effects of Spinal Mobilization with Arm Movement in the treatment of Cervicobrachial pain syndrome and to compare the effectiveness of Spinal Mobilization with Arm Movement (SMWAM) with the conventional therapy in the treatment of Cervicobrachial pain syndrome. Results shows that out come in the form of V.A.S, N.D.I percentage and R.O.M showed significant difference in subjects having Cervicobrachial pain syndrome who received SMWAM in comparison to conventional therapy treatment. Hence this study concluded that the effects of SMWAM will produce significant difference in the treatment of Cervicobrachial pain syndrome. There by the experimental hypothesis is accepted and the null hypothesis is rejected based on the outcome of the statistical analysis.

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