



Original Article

Comparison between Static Stretching Exercises and Eccentric Muscle Energy Techniques in Upper Cross Syndrome: Randomized Control Trial

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ABSTRACT

Neck pain is the most common complaint and Cervical pain is more common in middle-aged women than in males. The most prevalent reason for patients to seek medical attention is neck pain. **Objective:** To identify the effectiveness of stretching and muscle energy techniques along with mobilization of cervical segment in the management of upper cross syndrome. **Methods:** The randomized controlled experiment took place from August 2018 to January 2019 at Benazir Bhutto Orthopedic and Rehabilitation Centre in Pakistan (Rawalpindi) and included patients with upper cross syndrome that were randomly consigned to two equal groups using a lottery system. The Group-A patients management is eccentric muscular energy therapy with cervical segmental mobilization, although Group-B patients treatment protocol is static stretching exercises accompanied by segmental mobilization of cervical spine. Each patient received two sessions each week for three weeks, during which their visual analogue scale, and neck disability index were measured. An inclinometer was used to measure the cervical passive range of motion. Data was collected at the commencement of the study and again after three weeks of treatment. SPSS 21 was used to analyze the data. **Results:** Twenty (20%) of the 40 individuals were in each of the two groups. The average age in Group-A was 42.7511.13 years. It remained 40.509.14 years in Group-B. On all metrics, the eccentric muscular energy technique and static stretching approach equally demonstrated substantial results that is P Value is less than 0.05. **Conclusion:** Both approaches were shown to be equally successful in lowering neck impairment, enhancing cervical range of motion, and decreasing pain.

INTRODUCTION

In developed countries, neck pain is the most common complaint. Neck pain affects around 10-15% of the population. Cervical pain is more common in middle-aged women than in males, according to statistics. The most prevalent reason for patients to seek medical attention is neck pain [1]. Upper cross syndrome (UCS) is a type of neck pain caused by poor posture. This syndrome can create muscle imbalances in the head, neck, and shoulder region, as well as disordered posture [2]. According to research, 6-48% of UCS patients experience pain in the shoulder region

[3]. According to Janda, postural disorders revealed motor components of asymmetries in the frontal plane (sagittal axis) consequential in difficulty in recovering since long-lasting functional pain patterns. Muscle discrepancy is the major opponent of UCS [4]. While the deep cervical flexors, weakening and lengthening of the central and inferior trapezius are to blame [5]. Postural dysfunctions causes stress on muscles and joints surfaces that induces pain limited ROM [6]. Because diagnostic approaches are based on individual opinion, early detection and categorization

are frequently impossible. Quantification and detection of UCS at an early stage is achievable with the use of diagnostic processes, allowing for proper UCS prevention. Patients with muscular dystrophy can be helped in a more effective way if a thorough rehab plan is developed on a regular basis [7]. Different techniques such as muscular re-education, mobilization, strain-counter strain, relaxation of Soft Tissues, self-stretching, active isolated stretching (AIS), and various energy Techniques are nearly of the maximum conjoint management techniques for the management of spine impairments which reduces the ranges and postural dysfunctions [8]. MET has recently gained favor as a treatment modality for increasing the suppleness of contractile and non-contractile tissues [9]. Stretching exercises and manual therapy procedures, according to Cunha et al., both have a substantial effect on refining ranges of spine in individuals with stubborn neck discomfort [10]. Cervical mobilization is frequently used in conjunction along with physiotherapy and has been shown to be useful for the cure of neck pain and impairment in chronic patients with mechanical pain by lowering pain and improving neck ROM [11-13].

METHODS

The Randomized Controlled trial was conducted in Benazir Bhutto Orthopedic and Rehabilitation Department from August 2018 to January 2019. After receiving Institutional Review Board approval, sample size was estimated using Open Epi version 312 with a 95% confidence interval. The Visual Analogue Scale's mean values were calculated. A non-probability sampling strategy was utilised to increase the sample size. The lottery approach was used to assign patients to the control or interventional groups. Ages of UCS patients ranges between 30-65 years age, included both genders. Excluded patients which were suffered from trauma, tumors and degenerative changes. Informed patients consent was taken. Every individual gain 45 minutes of conventional physiotherapy sessions thrice a week for three weeks. In Group-A, standard TENS transcutaneous electrical nerve stimulation was utilised for 15-25 minutes with high-frequency (50-100 Hz), low-intensity (paresthesia), and small pulse width (50-100s) (interventional) [14]. Soft tissue techniques and pain were treated for 10-15 minutes with both TENS or a heating pad [15]. Cervical spine was managed with muscle energy technique. Patients were dictated to turn their heads in opposite manner. The therapist directed isometric resistance for 5 to 7 seconds ,before the patients utterly relaxed their muscles and joint surfaces after the completion of stretch techniques by the therapist. Repetitions were ranged from four to five [16,17]. Slowly,

with varying rhythm and pace, cervical segmental mobilization was conducted. In the resting posture, grade I-II mobilization for pain relief (2-3 sets) approximately 3-4 minutes were given . Conventional physiotherapy treatment heating pack and mobilization of cervical spine as well as stretching techniques of upper ,middle and lower fibres of trapezius muscles remained given in group B(control), just as they were in the Group-A(interventional group). Slow stretching was used for 10-60 seconds [18]. To increase the stretch of lateral fibres of muscles, one arm leaning headside to the side opposite and pushing the head in sitting position. The muscle was stretched for 15-30 seconds with 2-4 repeats due to the change in ROM and flexibility [19].

Variables	Experimental Group -A n(%)	Control Group -E n(%)	Together Groups n(%)
Matrimonial status			
Wedded	15(75)	16(80)	31(77)
Single	3(15)	4(20)	7(17)
Others	2(10)	0	2(5)
Occupation			
Businessman	3(15)	2(10)	5(12)
Executive	5(25)	5(25)	10(25)
Government Job	2(10)	2(10)	4(10)
Housewife	7(35)	11(55)	18(45)
Retired	1(5)	0	1(25)
Others	2(10)	0	2(5)
Duty Hours			
<6 hours	2(10)	0	2(5)
<12 hours	8(40)	8(40)	16(40)
<18 hours	0	1(5)	1(2)
No job	10(50)	11(55)	21(52)
Onset of pain			
Sudden	5(25)	7(35)	12(30)
Gradual	15(75)	13(65)	28(70)
Duration of pain			
3 month before	4(20)	8(40)	12(30)
6 month before	5(25)	4(20)	9(22)
9 month before	2(0)	3(15)	5(02)
12 month before	3(05)	3(05)	6(05)
More than a year	6(30)	2(10)	8(20)
Previous Treatment			
No treatment	3(15)	3(15)	6(05)
Self-medication	5(25)	4(20)	9(22)
General Practitioner	1(5)	3(15)	4(10)
Orthopaedic	6(30)	12(30)	
Physiotherapy	5(25)	4(20)	9(22)

Table 1: Demographic Data Of Patients

Variable	Cluster	Middle IO	P-value
Mann Whitney U -Assessment through Clusters A & B (Post Interference)			
neck Flexion	Trial	42.00 ± 24.75	0.602
	Control	40.00 ± 18.75	
Right Side Rotation	Experimental	60.00 ± 10.00	0.554
	Control	55.00 ± 12.50	
Visual analogue	Trial	4 ± 1.75	0.092
	Mechanism	5. ± 2.00	
Wilcoxon test pre and post comparison in Group-A (Eccentric MET)			
Variables	Pre Mean ± SD	Post Mean ± SD	P - Value
Neck bending	33.50 ± 23.75	42 ± 24.75	0.001
Right Cross Revolution	50 ± 13.75	6± 10.00	0.001
Visual Analogue	7 ± 1.00	4 ± 1.75	0.001

Wilcoxon examination pre and support contrast in Group-B (Still extending)			
Variables	Pre Mean ± SD	Post Mean ± SD	P - Value
Neck Bending	35.0 ± 20.00	40.0 ± 18.75	0.001
Right cross spin	50.0 ± 8.75	55.0 ± 12.50	0.001
VAS	7.0 ± 2.00	5.0 ± 2.00	0.001

Table 2: Within the Group analysis/ between the group ,data was normally distributed

Autonomous Trial T trial among Clusters				
Variables	Cluster	Pre Mean ± SD	Post Mean ± SD	P - Value
Frontward Skull Position	Trial	16.65± 2.37	13.90± 2.53	0.08
	Control	16.55± 2.11	15.20± 2.01	
Cervical Extension	Experimental	35.25± 4.72	43.25± 5.14	0.817
	Control	39.50± 7.59	43.75± 8.10	
Right Side Bending	Experimental	32.50± 8.03	40.35± 7.80	0.751
	Control	34.25± 7.48	39.60± 7.02	
Left Side Bending	Experimental	32.50± 8.66	39.80± 8.00	0.346
	Control	34.25± 4.38	37.85± 4.45	
Left Rotation	Experimental	53.00± 14.90	58.75± 13.85	0.543
	Control	53.75± 9.98	56.45± 9.40	
Neck Disability Index	Experimental	17.75± 5.41	13.90± 3.39	0.343
	Control	17.15± 4.79	15.10± 4.45	

Table 3: Parametric Examination for through cluster Study.

Patients were demanded to stand with 90 degree bent and lean towards forward along with upper trapezius and pectorals major stretch. Stretch is maintained for 10 to 25 seconds along with repetitions 3-4. To stretch or relax the levator scapulae stretch, the patients were recommended to sit in a chair with one hand and gently bring it down toward the armpit to sustain the depressed of shoulder and rotate opposite side of neck with the other hand on the back head. They were inculcated embrace the stretch for 10-30 seconds on each side with the 2 to 3 repts. Neck Disability Index and forward head posture analysis were used. Via Inclinator the rom of spine was calculated from the 1st session before intervention to last rehabilitation session. SPSS 21 version was used to estimate the data.

RESULTS

After treatment strategy 3 of patients were skipped due to not capable of completing the treatment plan. Total sample was 41 in which 21 were allocated in two different groups. There were 7 Male patients and 13 females in Group A. On the other hand, 4 males and 16 female patients in another group B. Age of Patients was estimated as 43.7611.10 years. The most frequently affected females acquiring 55% of housewives, 25% administrators, 13% of businessman and 10% of employees and others are 5%. The popular of the subjects (70%) had a steady commencement of discomfort, whereas 30% had a rapid onset of pain. In Group A, 25% of people had quick pain and 75% had plodding onset, whereas in Group B, 35% had sudden pain and 65% had deliberate onset. In terms of cervical flexion, right-side rotation, and VAS, no statistically significant difference between the groups when post-treatment data were compared (p>0.05 each). Within-group analysis, however, revealed substantial differences in before and

after intervention data (Table 2). The evaluation of after treatment outcomes through sets publicized no significant difference that is p value was less than 0.05. In both groups the difference was statistically significant before and after the treatments strategies.

DISCUSSION

The aim of this study was to see if employing static stretching and energy techniques in grouping with mobilization along with the TENS and heating pack may help patients with UCS improve their pain along with the cervical ranges. Because there is a severe lack of evidence for UCS, consequences are compared to impairments that is triggered by UCS. In this investigation, eccentric MET stayed originate to be similarly effectual for dropping pain and taming cervical ROM when compared to static stretching, as reported by another study [21]. MET improves stretch tolerance, which minimizes pain perception. Stretching and isometric contraction stimulate mechanic- and propio-receptors in muscles and joints [22]. Would lessen pain perception, making stretching more stress-free and acceptable. In addition, MET was found to be effective in relations of mobility for the cervical, thoracic, and lumbar spines in a study [19]. Stretching's effectiveness in falling neck pain and augmenting range of motion may be accredited to the effects of joint surfaces [23]. A study on the effects of stretching on neck discomfort and range of motion found that stretching can greatly improve pain and range of motion [24]. According to a recent study, stretching in combination with other therapies is useful in the management of pain and range of motion. Duration of four-week treatment procedure was used to examine the value of MET on patients in a study and to find out the effects of energy techniques of muscles on fit people as well. It involved 18 participants with limited cervical range of motion who were assigned to one of two groups: control or experimental. With MET, the results showed a considerably larger improvement in ROM. The findings showed that MET was a useful strategy for increasing cervical range of motion. This research backs up previous findings that MET improves ranges [6]. Both were shown to be similarly valuable in dropping neck pain and impairment. A study of 30 people indicated that both were beneficial in reducing aches and functional disorders in those with low back pain [25].

CONCLUSION

Both approaches were found to be effective therapy alternatives, according to the findings. Both strategies, however, were not used in isolation. TENS, IR, and mobility were used in conjunction with MET and stretching. Both

Interventional strategies together with conventional physiotherapy and manual therapy mobilization of cervical spine were reassuring in dropping the symptoms of upper cross syndrome.

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