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EFFICACY OF ERGONOMICS AND ISOMETRICS WITH STRETCHING IN TREATMENT OF MECHANICAL NECK PAIN

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ABSTRACT

Background: Neck pain is one of the most common musculoskeletal disorders in the general population. Point prevalence ranges from 6% to 22% and up to 38% of elderly population. Now days there is increasing demand of computer, industrial and physical workloads so poor ergonomics work design and certain psychosocial factors plays major role in development of mechanical neck pain. Such disorders have long been dealt as pain syndromes and first line of intervention used to be the medical treatment. But in past decades, due to advance researches and evidence, role of physiotherapy especially those of therapeutic exercise and ergonomics guidelines proved to be very helpful. **Objective:** The purpose of this study is to evaluate the efficacy of ergonomics and isometrics with stretching in treatment of mechanical neck pain. **Methodology:** RCT was conducted at Shalamar hospital Lahore. 50 patients were recruited in the study and divided into two groups with 25 patients in each group. Group A received therapeutic ultrasound along Ergonomics and Group B received therapeutic ultrasound along cervical isometrics and cervical stretches. Patient included in both groups have age between 20 and 40 years. Neck Disability Index (NDI) was used in this study. **Results:** Paired sample t-test was used within groups for analysis and independent t-test was used in intra-comparison of treatments. ($p < 0.05$). Statistically significant improvement is found in both groups. **Conclusion:** The result shows both the treatment techniques, muscle energy technique and static stretching were effective in alleviating the non-specific neck pain in terms of decreasing pain intensity and increasing active cervical range of motion as there was no significant difference between the two groups, however MET was superior than static stretching in decreasing pain intensity and increasing active cervical range of motion.

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INTRODUCTION

Neck pain is one of the most common musculoskeletal disorders in the general population. Pointprevalence ranges from 6% to 22% and up to 38% of elderly population while life timeprevalence ranges from 14.2% to 71 %.[1]

Chronic pain is defined as pain arising from superior nuchal line superiorly and inferiorly fromimaginary line along first thoracic spinous process tip inferiorly according to classification in(IASP) international Association for the study of pain.[2]

Mechanical neck pain is generalized neck and shoulder pain with mechanical characterization including symptoms provoked by maintained neck postures, neck movements or palpation ofcervical muscle.[3]

The source of symptoms in mechanical neck pain is not completely understood, but has been purported to be related to several anatomical structures particularly Zyg-apophyseal or uncovertebral joints of cervical spine.(4)Most common factors causing neck pain are weightlifting, stress, anxiety, awkward occupational postures and excessive physical

work.[5]

The contributing factors of neck symptoms are physical workloads; poor ergonomics work design and certain psychosocial factors.[6] In a Canadian study 54% of the general population had experienced neck pain for 6 months in which 5% were highly disabled by neck pain.[7] Alarge variety of therapeutic interventions are available for treatment of mechanical neck pain in which exercise therapy is widely used treatment. The Verhagen 2004 update indicated the use of active interventions was more effective than passive ones.[8]

Range of motion become restricted due to constant pain and localized tenderness also felt without sensory loss and decrease muscle strength.[9] According to Kurt and Pekunlu in 2015, both strength and endurance of muscles were improved by isometric exercises in cervical region. Cervical muscle stretching was used to increase flexibility of muscles as well as range of motion.[10]

METHODOLOGY

A randomized clinical trial was conducted at Physiotherapy department of Shalamar hospital, Lahore. Study was completed in six months duration from 6thjune 2015 to 6th December 2015after the endorsement from the moral audit advisory group from respective association dated 4thJune 2015 with reference no RCRS-RE/ON/spring15/020. Fifty female patients between age group of 20-55 years along mechanical neck pain and pain radiating to shoulders were included by using simple random sampling technique. Those female patients who suffered from inflammatory conditions, discogenic disease, spondylolysthes is and nerve root involvement were excluded. Consent was taken before preceding the Physiotherapy treatment. Both groups received the conventional therapy which was therapeutic ultrasound (ITO US 100) in continuous mode for five minutes and remained same throughout the treatment.25 patients were allocated to each group by flip a coin method. Group A was treated with the rapeuticultra sound along with printed representation of ergonomics and was explained to maintain it throughout the treatment. Group B was treated with conventional therapy along cervical muscle isometrics involving flexors, extensors, side flexors and rotators for 5 times a day with hold of 5seconds of each contraction and cervical muscle stretches were repeated 5 times a day with a maintained stretch of 30 seconds. Information was gathered at two levels one is before treatment and second is after 12 weeks of treatment. Neck disability index (NDI) was used to measure physical disability due to pain.

RESULTS

Out of 50 female patients, the mean age of group A was 30.32 with S.D 4.98 where as for group B mean age was 30.20 with S.D 5.033.

By applying paired t-test for Group A (t-cal-8.81, critical region 2.064) so we conclude that there was significant difference after treatment. After applying paired t-test on group B (t -calculated =20.73, critical region 2.06) so we conclude there was significant difference in neck disability index after treatment.

Out of 50 total patients (all females), 25 female patients in Group A showed improvement in NDI score after applying treatment. The mean score was for Group A after treatment 30.24 (S.D=5.39, n==25) .Another 25 female patient in Group B also showed improvement after treatment, the mean score was 9.4(S.D=2.84, n=25) after treatment. The standard deviation of d for group B was 4.96 and for group A was 2.04 which showed marked improvement in group B comparative to group A. After applying independent t-test on both Groups A and B after treatment (t-calculted= -17.086, critical region -2.0106), we concluded that there was significant difference in neck disability between Group A and B while calculating consistency for Group A=5.605 and Group B=3.3062 so Group B showed more

consistency and improvement.

Table 1.NDI Measure

Groups	Pre-treatment Score	Post-treatment Score	Standard deviation of d	p-value	Age	
					Mean age	Std Age
Group A	33.84	30.24	2.0412	0.00	30.32	4.98
Group B	28.72	9.4	4.9588	0.00	30.20	5.033

NDI= neck disability index

DISCUSSION

The studies which were conducted in the past really support the result of current study. According to this study combined physiotherapy treatment that is therapeutic ultrasound along cervical muscle isometrics and stretches can improve cervical range of motion and can decrease the symptoms of neck pain than therapeutic ultrasound and ergonomics alone.

Systemic review and meta-analysis of randomized clinical trials published in 2012 showed efficacy of cervical muscle isometrics in management of chronic neck pain.[11] A Randomized clinical trial in 2014, result showed that cervical muscle isometrics, stretching with ergonomics were more effective than ergonomics alone.[12] Therapeutics ultrasound along TENS was used in the treatment of mechanical neck pain in 2003.[13] A research was published in journal of Rehabilitation Sciences in 2007, showed that stretching and manual therapy both were effective treatment in reduction of mechanical neck pain.[14] A research was published in IJIR in 2016. It was an experimental study and showed that the group who receive isometric and ergonomics has got more relieve than ergonomics alone for neck pain in physiotherapy. Another experimental study published in 2009 showed that neck stabilization exercises along physical therapy agents were more effective than neck isometric alone.[15] A quantitative design study published in 2014 showed that active strengthening exercises for management of neck pain appear to be more effective in multi-modal therapeutic regime than alone.[16]

As indicated by Cochrane review in 2016, there was evidence of cervical muscle stretching along strengthening exercises in relief of mechanical neck pain. There were few studies available for physiotherapy management of mechanical neck pain.[17]

CONCLUSION

The Physiotherapy regime involving exercise therapy along thermal treatment (the rapeutic Ultrasound) was more effective in relief of pain in neck problem. Current study addressed the effect of comparative treatment which was lacking in previous literatures. Physiotherapists can work in a better way with this treatment regimen and can decrease the financial burden of patients. Further RCT's are required involving both genders and on national level.

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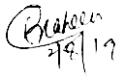
AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author's Full Name	Contribution to the paper	Author's Signature
1	Farah Shaheen	Conception, design, collection and assembly of data, statistical analysis, interpretation and drafting of article	
2	Sara Khawar Butt	Critical revision and statistical expertise