

ORIGINAL ARTICLE

Endurance Training vs Strength Training in Improving Functional Status in Women with Chronic Neck Pain

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ABSTRACT

Objective: The purpose of this study was to compare the effects of endurance vs strength training in improving functional status of women with chronic neck pain.

Study Design: Experimental, Randomized control study.

Place and Duration of Study: The study was conducted at Kulsoom International Hospital, Islamabad from February to July 2014.

Materials and Methods: Sample of 40 patients with chronic neck pain of age limit 20- 50 years were collected using purposive sampling technique and were randomly divided into two groups i.e. Endurance training and Strength training. Female patients having chronic neck pain (≥ 3 Months) were included in the study. Male patients, any pathology of neck and acute pain were excluded. Standardized treatment protocol including ultrasonic therapy, hot pack, shoulder dynamic exercises and postural education, was implemented to both groups. The improvement was measured by Shoulder Pain & Disability Index and Vernon Neck Disability Index. Data was analyzed on SPSS-21 and comparison among the two groups was analyzed using independent sample T-test.

Results: Mean age of the participants was 34.00 ± 5.67 years. 78 % females had pain for 5 months and 67% had radiating symptoms in to one or both upper limbs. Significant improvement was found in terms of reduced pain and disability in endurance training group for both tools (Disability Index and Vernon & Neck Disability Index) in comparison with strength training group.

Conclusion: It is concluded that Endurance training together is more effective than Strength Training in improving functional status in female patients of chronic neck pain of nonspecific nature.

Key Words: Endurance Training, Range of Motion, Shoulder Pain and Disability Index, Strength Training, Vernon Neck Disability Index.

Introduction

Cervical complaints are found to be one of the most emerging musculoskeletal complaints & requires attention of health professionals.¹ Neck pain is not only the most common musculoskeletal issue in West but it is also a recurrent source causing disability and badly effecting well-being.² Neck pain is categorized by ache, pain and soreness around the region of inferior surface of occipit to the first thoracic vertebrae. Chronic neck pain lasts more than 03 month of occurrence and affects the quality

of life of persons with neck pain.¹ Non-specific neck pain refers to the pain which is postural or mechanical in nature.³ There are different contributing factors for neck pain including poor posture; prolong sitting, computer users, work station and static posture. Young age and female gender are also risk factors for developing neck pain.⁴ Neck pain has direct and indirect cost on society and puts great burden on economy of countries.⁵

It is the need of hour to find better treatment option for neck pain. There are numerous treatment options in literature for managing chronic neck pain. The conservative treatment includes active exercises, manual therapy, posture education, resisted exercises, and manipulative therapies for managing pain intensity and stabilization of neck. Recent advancement shows that conservative management is good and cost effective, with good exercises.^{6,7} But there are certain limitations regarding long term effect and sustainability of muscles after treatment.^{8,9} The excessive stress and static posture continually putting greater pressure

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on neck region and the treatment relieves the temporary symptoms.¹⁰

Both endurance and strength training have impact on relieving neck pain. It is observed that long duration of work has reduced endurance of muscles around neck region and fatigue is common in people with neck pain. Endurance training has significant outcome regarding ranges and functional outcome.¹⁰ Whereas general strengthening is good for relieving pain and functional status but yet it is controversial that pain reduction is either due to strengthening of muscles or reduction in fatigability of muscles.^{11,12} So the current study is designed to further elaborate if strength training is more effective or endurance training for long term improvement in terms of functional status.

Materials and Methods

The study was randomized control trial and it was conducted at Kulsoom International Hospital, Islamabad from February to July 2014. Females with chronic neck pain for at least 3 months were included in the sample. Any patient with acute neck pain or any other pathology and males were excluded from the study. 40 patients with chronic neck pain were recruited through purposeful sampling technique. They were randomly allocated to each groups' i.e. Endurance Training Group (n=20) and Strength Training Group (n=20). Data was collected by physiotherapist. Written informed consent was taken.

Strength training group contained 20 patients who were treated with ultrasonic therapy followed by applying hot pack and intensive isometric neck strengthening exercises. Endurance training group contained 20 patients who were treated with ultrasonic therapy followed by applying hot pack and active neck exercises which included lifting the head up from supine and prone positions. Patients from both groups were given correct postural education and were made to do dynamic exercises for shoulder. Both groups were suggested to repeat the exercise plan once a day for 3 weeks. Their pain intensity was assessed by therapist through Visual Analogue Scale. Functional status was assessed through shoulder pain and disability index and Vernon neck disability index. Statistical analysis was done applying the statistical package for social sciences version 21 (SPSS - 21). Documented results were in the form of

Mean ± Standard Deviation. Test of choice for comparison among the two groups was independent sample t - test based on normality test. P value of < 0.05 was considered significant for analyzing both groups.

Results

Data of 40 female participants with chronic neck pain was included in the study. Mean age of the participants was 34.00 ± 5.67. Almost 78 % females had pain for 5 months and 67% had radiating symptoms in to one or both upper limbs. Independent sample t-test of homogenous data with comparison of mean and standard deviation is shown in table 1s.

Table 1: Comparison of Mean ± Standard Deviation of Assessment Tools for Strength Training Group and Endurance Training Group

Variables	Strength Training Group Mean ± SD	Endurance Training Group Mean ± SD	P- VALUE
Shoulder Pain & Disability Index (Baseline)	42.34 ± 7.87	40.09 ± 8.67	0.152
Shoulder Pain & Disability Index (Post Intervention)	33.72 ± 9.35	26.49 ± 8.67	0.015*
Vernon Neck Disability Index (Baseline)	17.23 ± 4.56	18.02 ± 3.65	0.071
Vernon Neck Disability Index (Post Intervention)	13.60 ± 3.69	11.15 ± 2.96	0.026*

* = P < 0.05

Above table shows that after applying intervention significant improvement was seen in endurance training group with p value <0.05.

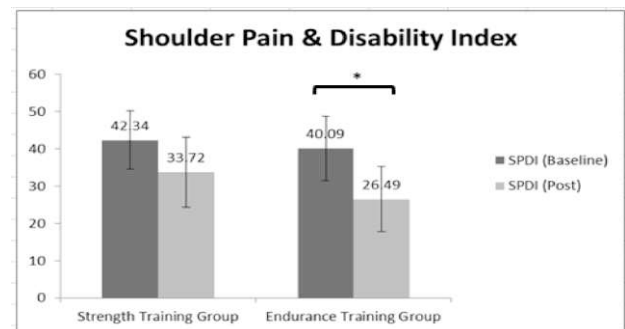


Fig 1: Comparison of Mean & Standard Deviation of Shoulder Pain & Disability Index after Treatment across Groups

Above figure shows mean and standard deviation on Shoulder pain and disability index for both groups. Significant P - value was found after intervention in endurance training group.

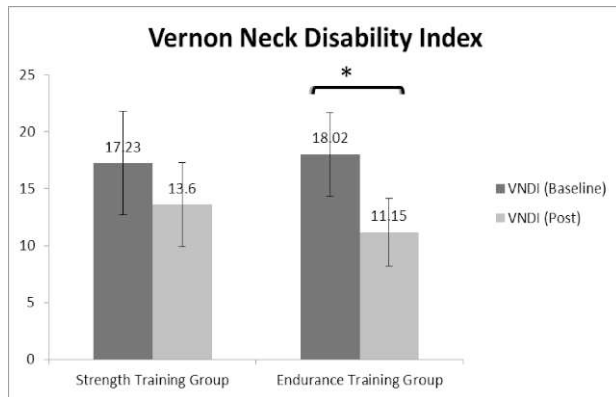


Fig 2: Comparison of Mean & Standard Deviation of Vernon Neck Disability Index after Treatment across Groups

The P value of Post-Total Vernon Neck Disability Index (NDI) is 0.026 ($P < 0.05$) showing that there is a significant improvement in endurance training group

Discussion

The study summarizes that the endurance training has significant improvement in functional status in females with chronic neck pain as compared to strength training in addition to conventional therapy. The endurance training also reduces the disability level as compare to strength training. A similar study done by Taimela also reported that active exercises and endurance exercises along with posture re-education in chronic neck pain gives better results in reducing the disability level.¹³ Ylinen J and colleagues in their study also supported that the intensive endurance exercises for non-specific neck pain notable effects on pain intensity, ranges and functional level.¹⁰ Another study was conducted to evaluate similar training in the treatment of chronic neck pain in 2007, in which individuals of both strength and endurance training groups showed marked reduction in neck pain and disability. Contradictory study was carried out for longer duration and both genders were part of it.¹²

In 2001 Bronfort G concluded that active neck exercises has good results in long term, regarding the functional and disability level of chronic neck patients.¹⁴

Falla D, Jull G, Hodges P & Vicenzino B conducted a

study on effect of endurance-strength training regime in reducing myoelectric manifestations of cervical flexor muscle fatigue in females with chronic neck pain and also reveals results similar to current study that endurance training has capability to improve the muscle flexibility and reduces the fatigability for prolong postures and hence it is a good treatment option for patients with chronic neck pain.¹¹ Ninaknder reported that the energy expenditure have strong links with severity of symptoms in chronic neck pain, disability level and functional status in females. The specific exercises are beneficial and endurance exercise with specific frequency are beneficial for relieving the symptoms in female with chronic neck pain.¹⁵ The study emphasizes that endurance training in females also reduces re-occurrence of neck pain. This type of training also improves the quality of life and improves functional status while working for prolong duration after episodes of neck pain.¹⁶

Peolsson conducted a similar study on females having non-specific neck pain and compared with healthy individual, he concluded that endurance exercise increases the muscular endurance and decrease the impairment after neck pain. The specific designed treatment is effective in improving the functional status of patients.²

Further studies should be conducted with larger sample size and longer duration.

Conclusion

Conclusion derived from the current study is that endurance training is more effective as compared to strength training in improving functional status in subjects of chronic neck pain of non-specific in nature. Endurance training yields significant additional benefits with regards to pain, function or disability. Endurance training should be considered as a therapy of choice for patients with chronic neck pain of nonspecific nature caused by poor postural habits due to muscular imbalance.

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