DOI:https://doi.org/10.54393/pbmj.v5i7.628

PAKISTAN BIOMEDICAL JOURNAL

https://www.pakistanbmj.com/journal/index.php/pbmj/index

Volume 5, Issue 7 (July 2022)

Original Article

Comparison between Strength Training and Endurance Training in Neck Pain patients: A RCT

Mahnoor Bugti[1], Rabia Khan[2], Muhammad Khan Bugti[3], Umar Shakoor[4], Muhammad Ammar Naveed[5], Muhammad Shahid Shabbir[6], Hanan Azfar[7], Danish Latif[2]

[1]Baqai Medical University, Karachi, Pakistan
[2]Bahria University Health Sciences, Karachi, Pakistan
[3]Nusrat Bhutto Women University, Sindh, Pakistan
[4]University of Chenab, Gujrat, Pakistan
[5]Shaheed Zulfiqar Ali Bhutto Medical University, Sindh, Pakistan
[6]Zohra Institute of Health Sciences Rawalpindi, Pakistan
[7]Al Shifa Future Hospital Gujranwala, Pakistan

ARTICLE INFO

Key Words:
Strength Training, Neck pain, physicians, chronic . neck pain

How to Cite:
Bugti , M. ., Khan , R., Bugti , M. K. ., Shakoor , U. ., Ammar Naveed , M. ., Shahid Shabbir , M. ., Azfar , H. ., & Latif , D. (2022). Comparison between Strength Training and Endurance Training in Neck patients: A RCT: Strength Training and Endurance Training in Neck patients. Pakistan BioMedical Journal, 5(7). https://doi.org/10.54393/pbmj.v5i7.628

***Corresponding Author:**

Mahnoor Bugti
Baqai Medical University, Karachi, Pakistan
mahnoorbugti@gmail.com

Received Date: 5th July, 2022
Acceptance Date: 14th July, 2022
Published Date: 30th July, 2022

ABSTRACT

Common Neck pain is one of the most common issues in this era. Every other working woman have been complaining about neck problems. **Objective:** To determine the effect of intensive isometric and mild endurance training of neck muscles in women with chronic neck pain. **Methods:** Female patients suffering from neck pain were randomly enrolled into three groups. Group A was of control patients and group B and C were Interventional group. Consent form was taken and participants were fully informed about the task. This process ensured that in each group patients distributed with equal severity of neck pain. These states were assessed mainly by medical history and clinical examination before entering the study. **Results:** In current study, exercise program was examined at different intervals of follow-up visits through interviews. **Conclusion:** Strength and Endurance training both methods are effectively improving discomfort and debility in females by nonspecific, long-lasting neckline discomfort. Aerobic exercises and stretching along with strength training are more effective as compare to perform alone aerobic exercise.

INTRODUCTION

Common Neck pain is of most common issue in this era. Every other working woman have been complaining about neck problems [1,2]. Probably 54 percent of Canadian population complain about neck pain within 6 months and 5 percent people got neck disability [3,4]. Neck pain mostly occurs in episode or relapse after intervals. Incidence rate of chronic neck pain occurred 7 percent in women [5]. Etiology of neck pain pathophysiology is still unclear because only few working women showed degenerative changes with age. The cause of neck pain can be multi factorial due to stress and tension in muscles which cause micro-trauma [6]. Degenerative changes in vertebra with

DOI:https://doi.org/10.54393/pbmj.v5i7.628

age are predictable and increase asymptomatically with age. That is why in most cases MRI doesn't rule out the cause of neck pain [7-10]. In previous studies traditional physical therapy only with stretching and aerobic exercises has been done which did not show significant improvement in neck pain recovery. However, combined with endurance training or strength training showed significant effects on chronic neck pain. In another randomized study conducted on two groups, control and interventional. Control group advised to do home plan aerobic exercise alone and interventional group underwent strength training session along with aerobic exercise sessions. The result were obvious, interventional groups showed significantly improvement in neck stiffness and pain [11]. Many studies have been done on neck pain but still somehow, the standard treatment is lacking. Treatment of neck pain should be comprising of both active and passive therapies instead of single effective one [11,12]. Nevertheless, these treatments done by physicians [13]. The goal of study was to find out the impact of intense isometric neck strength therapy and mild endurance therapy of neck muscles in treatment of women having chronic neck pain.

METHODS

Study is a randomized control trial was conducted in Holy Family hospital. Duration was between Feb 2018 to March 2019 Sample size was based on 180 female office working women, age between 24 to 63 years with non-specific, chronic pain for more than 6 months. The sampling technique was non purposive sampling. Women with history of neck trauma, disc prolapse and post-operative complications and other problematic causes were not included. Patient was randomly assigned into three groups. Group A is control group and group B and C Were Interventional group. Consent form was taken and participants were fully informed about the task. This process ensured that in each group patients distributed with equal severity of neck pain. These states were assessed mainly by medical history and clinical examination before entering the study. Both training groups performed upper extremities aerobic exercise. Strength training group performed highly intensive isometric neck exercises and durability exercise done lively movements which include elating cranium as of horizontal position. Both training groups performed stretching and aerobic exercise on regular daily basis 3 times per week. Both interventional groups underwent rehabilitation session including common traditional exercises i.e. cardio and relaxing training, motivational support to improve the pain as well. During this program each subject had four sessions of physical therapy which include mobilization techniques to improve the pain and to make them perform active muscle movements. To measure the pain and disability NDI, visual analog scale, and Vernon neck disability index scales were used. Variables include were age, height, weight, symptom and smoking. Measures were taken as pre and post treatment in all groups, at the base line and after a year when intervention period is completed. Neck pain of participants were perceived through vial analogue scale [14] Disability of neck was measured via Vernon neck disability scale modified neck and shoulder pain and disability index [15] and Vernon neck index [16]. Each scale represents 0 to 100 theoretical range. There was 1-year continuation. And patients had to define the neck pain on 6-point scale (level I show sever pain while 6 show no pain at all.) While on the other hand, control group participants came for pre and post measurements of strength. They performed recreational activities and they were advised to do aerobic 3 times in a week. Analysis was done by Stata Statistical Software type 8.0. Shaprio-wilk test was used to evaluate the normality of variables. Measures of outcomes variables sowed in means and SDs and median. Comparison between groups was done statistically by using the t test, Mann-Whitney U test. Analysis of variance with and Kruskal-Wallis test. Hommel adjust-ments were applied to get correct level of significance confidence interval was 95%. Thelevel was set at .05 for all tests.

RESULTS

After 12 months' follow-up, both pain and disability improved in both training groups. And showed significant outcomes as compared to the control group. P<0.001). Intensive isometric strength training group showed improvement in flexion by 110%, 76% rotation and 69% extension. Endurance training group showed improvement in respective terms 28%, 29% and 16%. While in control cluster there were 10%, 10% and 7% progress, correspondingly. ROMs also improved statically in both groups as compare to control group.

Variable	Control (60)	Endurance(59)	Training(60)
Height in cm	164(5)	165(6)	165(5)
Mass in kilogram	69(12)	68(10)	67(11)
BMI	26(4)	25(3)	25(3)

Table 1: Demographics

Variable	Control	Endurance	Training
Neck Pain Period	8(5)	9(6)	8(6)
Depression score	6(3)	6(4)	5(3)
Strength of grip, right	293(54)	299(50)	299(54)
handPower of grasp, leftwards	266(46)	270(53)	286(52)
02 uptake (max), mL/kg per min	31(5)	32(4)	33(5)
Smoking No (%)	10(17)	12(20)	10(17)

Table 2: Experimental Variables

DOI:https://doi.org/10.54393/pbmj.v5i7.628

DISCUSSION

Outcome of our studies indicated that endurance training and strength training reduce the neck pain and disability as compared to the control group. ROMs of neck and strength was significantly improved. A study showed same effects I group of subjects with neck pain. After training of strength exercises of neck pain get improved but different multi-disciplinary rehabilitation program did not show any drastic change in pain symptoms [17]. Hence, this study supports the outcome of current study. The findings of various previous RCT studies [18,19]. do not fully indicated positive results in effect of exercises used for neck functions and improvement was a minor. However, it is clear that patient with neck pain can bear the intensive neck strength exercises and show significant improvement [18,19]. In current study, exercise program was examined at different intervals of follow-up visits through interviews. That's why maintain the factor of complications as well. This strategy is not commonly used in last researches which can be a fact that results are lacking the long term progress. Reddy Shankar et.al [20] findings suggest that proprioception and neck endurance reflect distinct and independent dimensions of neck extensor muscle function in subjects with Chronic Neck Pain [21]. Pain that is often experienced with intensive exercise may be cause a fear of pain and prohibit the patient to perform exercise. Intuitional exercise program is built to make the patient to overcome. And this therapy motivated those to perfume exercise regularly. Extracting from literature review it is very clear that many study's outcomes overlap the result of our study and many studies lacking few factors that is effecting their results. It is indicated that strengthening and endurance training of one-year follow-up can effectively reduce the neck pain and disability in working women. And these outcomes can be beneficial in future rehabilitation based on evidence based practice.

CONCLUSION

Strength and Endurance training both methods are effective for improving discomfort and disability in females with nonspecific, long-lasting neckline discomfort. Aerobic exercises and stretching along with strength training are more effective as compared to perform the aerobic exercises alone.

REFERENCES

[1] Gallego Izquierdo T, Pecos-Martin D, Lluch Girbes E, Plaza-Manzano G, Rodriguez Caldentey R, Mayor Melus R, et al. Comparison of cranio-cervical flexion training versus cervical proprioception training in patients with chronic neck pain: a randomized controlled clinical trial. Journal of Rehabilitation Medicine 2016 Jan 1;48(1):48-55. doi: 10.2340/16501977-2034.

[2] Lluch E, Schomacher J, Gizzi L, Petzke F, Seegar D, Falla D. Immediate effects of active cranio-cervical flexion exercise versus passive mobilisation of the upper cervical spine on pain and performance on the cranio-cervical flexion test. Manual Therapy. 2014 Feb;19(1):25-31. doi: 10.1016/j.math.2013.05.011.

[3] Della Casa E, Affolter Helbling J, Meichtry A, Luomajoki H, Kool J. Head-eye movement control tests in patients with chronic neck pain; inter-observer reliability and discriminative validity. BMC Musculoskelet Disorders. 2014 Jan 14; 15:16. doi: 10.1186/1471-2474-15-16.

[4] Falla D, Lindstrøm R, Rechter L, Boudreau S, Petzke F. Effectiveness of an 8-week exercise programme on pain and specificity of neck muscle activity in patients with chronic neck pain: a randomized controlled study. European Journal of Pain. 2013 Nov;17(10):1517-28. doi: 10.1002/j.1532-2149.2013.00321.x.

[5] Lluch E, Arguisuelas MD, Coloma PS, Palma F, Rey A, Falla D. Effects of deep cervical flexor training on pressure pain thresholds over myofascial trigger points in patients with chronic neck pain. Journal of Manipulative and Physiological Therapeutics. 2013 Nov-Dec;36(9):604-11. doi: 10.1016/j.jmpt.2013.08.004.

[6] Gupta BD, Aggarwal S, Gupta B, Gupta M, Gupta N. Effect of deep cervical flexor training vs. conventional isometric training on forward head posture, pain, neck disability index in dentists suffering from chronic neck pain. Journal of clinical and diagnostic research: JCDR. 2013 Oct;7(10):2261-4. doi: 10.7860/JCDR/2013/6072.3487.

[7] Song WJ, Sohng KY. Effects of progressive resistance training on body composition, physical fitness and quality of life of patients on hemodialysis. Journal of Korean Academy of Nursing. 2012 Dec;42(7):947-56. doi: 10.4040/jkan.2012.42.7.947.

[8] Borisut S, Vongsirinavarat M, Vachalathiti R, Sakulsriprasert P. Effects of strength and endurance training of superficial and deep neck muscles on muscle activities and pain levels of females with chronic neck pain. Journal of physical therapy science. 2013 Sep;25(9):1157-62. doi: 10.1589/jpts.25.1157.

[9] Schomacher J, Falla D. Function and structure of the deep cervical extensor muscles in patients with neck pain. Manual therapy. 2013 Oct;18(5):360-6. doi:

DOI:https://doi.org/10.54393/pbmj.v5i7.628

10.1016/j.math.2013.05.009.

[10] Gross A, Forget M, St George K, Fraser MM, Graham N, Perry L, et al. Patient education for neck pain. Cochrane database of systematic reviews 2012 Mar 14;(3):CD005106. doi: 10.1002/14651858.CD005106.pub4.

[11] Damgaard P, Bartels EM, Ris I, Christensen R, Juul-Kristensen B. Evidence of physiotherapy interventions for patients with chronic neck pain: a systematic review of randomised controlled trials. International Scholarly Research Notices. 2013 Apr 15; 2013:567175. doi: 10.1155/2013/567175

[12] Sihawong R, Janwantanakul P, Jiamjarasrangsi W. Effects of an exercise programme on preventing neck pain among office workers: a 12-month cluster-randomised controlled trial. Occupational and environmental medicine. 2014 Jan 1;71(1):63-70. doi: 10.1136/oemed-2013-101561

[13] Ludvigsson ML, Peterson G, O'Leary S, Dedering Å, Peolsson A. The effect of neck-specific exercise with, or without a behavioral approach, on pain, disability, and self-efficacy in chronic whiplash-associated disorders: a randomized clinical trial. The Clinical journal of pain. 2015 Apr;31(4):294-303. doi: 10.1097/AJP.0000000000000123.

[14] Fritz JM, Thackeray A, Brennan GP, Childs JD. Exercise only, exercise with mechanical traction, or exercise with over-door traction for patients with cervical radiculopathy, with or without consideration of status on a previously described subgrouping rule: a randomized clinical trial. journal of orthopedic & sports physical therapy. 2014 Feb;44(2):45-57. doi: 10.2519/jospt.2014.5065.

[15] Don Kim K, Lee HJ, Lee MH, Ryu HJ. Effects of neck exercises on swallowing function of patients with stroke. Journal of physical therapy science. 2015 Apr;27(4):1005-8. doi: 10.1589/jpts.27.1005.

[16] Falla D, O'Leary S, Farina D, Jull G. The change in deep cervical flexor activity after training is associated with the degree of pain reduction in patients with chronic neck pain. The Clinical journal of pain. 2012 Sep;28(7):628-34. doi: 10.1097/AJP.0b013e31823e9378.

[17] Price J, Rushton A, Tyros I, Heneghan NR. Effectiveness and optimal dosage of resistance training for chronic non-specific neck pain: a protocol for a systematic review with a qualitative synthesis and meta-analysis. BMJ open. 2019 Feb 19;9(2): e025158. doi: 10.1136/bmjopen-2018-025158.

[18] Ferguson B. ACSM's guidelines for exercise testing and prescription 9th Ed. 2014. The Journal of the Canadian Chiropractic Association. 2014 Sep;58(3): 328.

[19] Schomacher J, Falla D. Function and structure of the deep cervical extensor muscles in patients with neck pain. Manual therapy. 2013 Oct 1;18(5):360-6. doi: 10.1016/j.math.2013.05.009.

[20] Reddy RS, Meziat-Filho N, Ferreira AS, Tedla JS, Kandakurti PK, Kakaraparthi VN. Comparison of neck extensor muscle endurance and cervical proprioception between asymptomatic individuals and patients with chronic neck pain. Journal of Bodywork and Movement Therapies. 2021 Apr; 26:180-186. doi: 10.1016/j.jbmt.2020.12.040.

[21] Blomgren J, Strandell E, Jull G, Vikman I, Röijezon U. Effects of deep cervical flexor training on impaired physiological functions associated with chronic neck pain: a systematic review. BMC musculoskeletal disorders. 2018 Nov 28;19(1):415. doi: 10.1186/s12891-018-2324-z.