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EFFECTS OF PNF STRETCHING EXERCISES ON NECK PAIN, TRIGGER POINT, AND RANGE OF MOTION OF NECK IN FEMALES WITH CHRONIC NECK PAIN

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Short Profile

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ABSTRACT:

Introduction: Chronic pains are one of the major health problems throughout the world. Around the world, chronic pains are the most common cause of human suffering, disability and seriously affect the quality of human life. In the meantime, neck pain and its complications are the most common causes of disability and pain in different societies. PNF stretching exercises as one of the non-pharmacological methods of pain relief, reduce pain, improve range of motion, and increase satisfaction. Methodology: in this clinical trial, ten people were chosen randomly among female employee aged 20-45 with chronic neck pain who had trigger points. Before starting the treatment, severity of pain was measured by Pain index Visual analog scale. Also, before and after the treatment, range of neck motion was measured by Goniometer. Then, ten treatment sessions were done by PNF stretching exercises with CR technique twice a week for five weeks. After finishing the treatment sessions, the severity of pain and the range of neck motion were assessed for the second time. Descriptive and analytical statistics were used to analyze the data. SPSS 20 was used for all calculations. Results: the mean of assessed pain severity before the treatment sessions was lower than the mean after treatment significantly ($p<0.05$). The range of motion of neck after treatment was improved significantly compared with the range of neck motion before the treatment ($p<0.01$). Average number of pain trigger points in the neck and shoulder girdle after treatment

was significantly lower than before treatment ($p<0.01$). Conclusion:PNF stretching exercises reduce the severity of chronic neck pain and the number of pain trigger points. Also, the exercises improve the range of neck motion.

KEYWORDS
neck pain, PNF exercises, range of motion, chronic pain, trigger points.

INTRODUCTION

In today's sedentary lifestyle, people spend a lot of time in a static situation, therefore, is a dynamics muscles are inhibited and postural muscles are been stiff and inflexible progressively. Imbalance between postural and dynamic muscles is developed gradually which may lead to pain syndrome (yap et al. 2007). Chronic pains are one of the major health problems throughout the world. Around the world, chronic pains are the most common cause of human suffering, disability and seriously affect the quality of human life (Lazro et al. 2001). Prevalence of neck pain is increasing in the world. Dysfunctional and insufficient tension of the neck muscles during work, exercise, or daily activities is an important factor for chronic pain in the neck (Falla 3004). This disease has many effects on individuals, their job, families, communities, health systems. The prevalence of neck pain in the society is about 23.1% and it has been seen in women more than men (Hooy 2010). Also, the neck pain is the cause of 21%, 30%, and 95% of referrals to orthopedic clinics, general clinics, and pain clinics respectively (BroogStingi 2002). In most cases, patients with neck pain have pain trigger points. According to the epidemiologic studies, trigger points are the main cause of pain in 85% of patients who refer to pain clinics (Gervin 1997). In some of studies, trigger points are introduced as the primary source of musculoskeletal pain (Taget It, 2007). Trigger points are the excitability centers which are located in muscle tissue or its fascia, ongoing pressure on these points cause to twinge at the spot and surrounding areas. Neck and shoulder's trigger points associated with public health and quality of life and decrease performance in the ordinary life and career (Farahani, 1380). Currently, treatment of the neck pain is generally focused on reducing pain and disability. Some of the used treatments include the use of medication such as acetaminophen, non-steroidal anti-inflammatory drugs, injecting anesthetics such as Lidocaine and in acute and chronic cases, neck corsets, physical therapy, cold therapy, heat therapy and treatment handy are used (Brinstin 2007). Facilitation practices of neuromuscular are the base of many motor patterns for facilitation and the correction of sensory-motor function. Accordingly, it has been stated that these practices modify the faulty messages that are sent by proprioceptive receptors in muscles (Ves 1985), thus, pain reduce and muscle tone will improve.Several studies on the impact of different therapeutic approaches have been performed on muscle aches, such as conducted study by Ziaifar and his colleagues (1392) that compared the effect of dry needle on pain severity of active trigger points in the upper Trapeziuswith the effects of ischemic pressure. The results showed that both methods had the same impact on reducing the severity of pain (Ziaifar et al, 1392). Also, Mohamadi in 1391 in a study on 80 women aged 20-40 with MS showed that massage therapy and aromatherapy, both have the effect of reducing the amount of pain, but the impact of aromatherapy was greater. The positive impact of non-pharmacological methods such as massage and movement therapy in preventing, reducing pain and increasing the ability of patients with low back pain in constant time have been shown by Richardson &Gamilton in 2002 (by Richardson &Gamilton 2002). Sadi in1982 compared Static PNF stretching techniques with Ballistic stretching on the shoulder, chest, and hamstring

muscles, the findings showed that PNF stretching makes greater range of motion in each three joints significantly in comparison with other stretching methods (Sadi 1982).

Chronic neck pain impact on quality of life and make huge financial burden on the country's health system (Tagtit 2007). Searching non-pharmacologic and effective treatment options can reduce the pain and suffering caused by the disease and also reduces the financial burden as well.

The purpose of this study is to evaluate the effect of PNF stretching exercise on pain severity and the range of motion in people with chronic neck pain that have pain trigger points.

METHODOLOGY

In this clinical trial, among female employee patients aged 20-45 with chronic neck pain that their pain trigger points were diagnosed by specialist doctors and physiotherapists who referred to physiotherapy clinics of Razi Hospital in Ahvaz, ten people were selected randomly. Written and verbal consent were obtained of all participants. Before starting the treatment, severity of pain based on a numerical scale of pain and the range of motion were measured by Goniometer. Then, ten treatment sessions were done by PNF stretching exercises with CR technique twice a week for five weeks. After finishing the treatment sessions, the severity of pain and the range of neck motion were assessed for the second time. In this study, PNF stretching exercise is independent variable and pain severity and the range of neck motion are dependent variables.

INCLUSION CRITERIA

Employee women aged 20-45, having pain trigger points for 12 months, Identify trigger points by specialist physicians and physiotherapists

Exclusion criteria

Having disease such as Rheumatoid Arthritis, Spondylosis, Torticollis, history of fracture, surgery, and bone dislocation.

Used instruments in this study to measure the variables included:

-Scale Numerical Pain Index
-Neck Disability Index questionnaire
-Goniometer

Treatment plans of PNF stretching exercise:

First step:

1.The patient was put in the sitting position and lateral flexion was given in her neck. Then the therapist's hand was bent as resistance and the patient was asked to push the side of neck to the therapist's hand for 10 seconds.Thismotion causes the contraction which is as an isometric contraction. First, flexion was

performed in a direction that did not have trigger points.
2.In the next step, lateral flexion was performed in a greater range of motion than the previous stage for 10 seconds.
3.In the third stage, lateral flexion was performed in a greater range of motion than the previous stage for 10 seconds.

Note: All three steps were carried outconsecutively and at each stage, the neck was not returned to the first stage.

Second step:

1.The lateral flexion was hold for 10 seconds and then she was returned. Resistance provided by the therapist's hand and the contraction was as an Isometric contraction.
2.10 seconds lateral flexion (in greater range of motion) back to the first case
3.10 seconds lateral flexion (in greater range of motion) back to the first case

Resistance provided by the therapist's hand and the contraction was as an Isometric contraction.

Note:Each session consisted of three sets of three. Also, if trigger point was one-sided flexion was done in the normal side of the neck. The neck was not returned during contraction, but there was a side of trigger, the neck was straight and then took flexion. Flexion was done by therapist's hand again (Kisner 2007).
Analysis

Descriptive and analytical statistics were used to analyze the data. SPSS 20 was used for all calculations. In this study, independent and dependent t-test were used to hypotheses test and determining significant differences between the scores before and after treatment. Variables in this study including: severity of pain, reducing trigger points in neck and shoulder belt, and range of neck motion. Leven's test was used for equality of variance and the results show the equality and homogeneity of variance. Thus, the t-test with equal variances was used.

Findings

The mean age of participants was 34.40, Average height and weight were 162.5 cm and 58.1 kg respectively (Table1).

Table1.Demographic characteristics

N	Sex	Age	Height	Weight
10	Female	38 ±2.03	159±1.45	61±2.29

The pain scores in the participants before and after treatment were 20.3 and 11.9 respectively. The T-test showed a significant difference (p=0.014). The average number of pain trigger points in the neck and shoulder girdle was 26.9 and it was 11.9 after treatment. T-test showed significant difference between the number of trigger points before and after treatment (p=0.009). The mean range of neck motion and lateral

flexion in the before treatment was 2/38 and 4/43 after treatment.T-test showed significant difference between the range of neck motion and lateral flexion before and after treatment (p=0.003)(Table2).

Table2.mean & SD of parameters

parameter	Before the Intervention	After Intervention	p
Number of Trigger point	26/90±5/527	5/527±15/10	0/009
Range of Motion	38/20±5/287	43/40±2/591	0/003
Pain Severity	20/3±4/057	11/90±7/8	0/014

DISCUSSION

This study aimed to determine the effect of PNF stretching exercises on the severity of neck pain, range of motion and trigger points in individuals with chronic neck pain which had pain trigger points. Pain and muscle weakness are two common symptoms of neck pain in patients with chronic neck pain. Proprioceptive neuromuscular facilitation is an exercise therapy method based on the anatomy and physiology of human performance, this method uses the intramuscular, subcutaneous and hearing inputs deep to develop the motor skills performance. PNF is a vital component in the rehabilitation of sports injuries trend. The techniques recommended to increase strength, flexibility and the range of motion (Farahani 1380).Few studies have been done on therapeutic exercise program or doing stretching exercise on chronic neck pain. Linen and his colleagues reported that exercise therapy program is effective for treating chronic neck pain (Yline et al 1994). In a study that compared the effectiveness of neural facilitation exercise with traditional exercise on severity of pain among men and women showed that neuromuscular facilitation exercises significantly reduce chronic neck pain. Also, Taniva in 2012 in a study on 28 pregnant women investigated the effectiveness of pelvic stability exercise and Proprioceptive neuromuscular facilitation; they stated that both practices have a significant impact on the relief of pain. The results of our study have shown that PNF stretching exercise with CR technique reduces severity of chronic neck pain significantly. According to the new theory, spasm of muscle spindles is the key factor in the development of trigger points. Muscle stretching is a fundamental component of treatment in the patients, thus, it can reduce the pain. Also, stretching increases the blood supply, releases the pain, reduces fatigue and increases the threshold of pain receptors and thus reduces the severity of pain. In this study PNF stretching exercises reduce the pain trigger points in patients with chronic neck pain. These results are in line with previous studies. Also, the results of this study have been shown that PNF stretching exercises improve the range of neck motion. Sedaghati in his study examined the effect of static stretching and PNF stretching exercise on the static and dynamic range of the thigh muscles. The results showed that proprioceptive neuromuscular stretching exercises significantly increase the range of motion, static power, and dynamic power in hip muscles compared with static stretching exercises (Sedaghati 1376). Folan& Marin in a study investigated the effect of different intensities of static contraction in the PNF stretching exercises with CR techniques on hamstring stretch range. The results showed that increasing the flexibility was not significantly different between subject groups, but it was more than the control group significantly. Finally, they concluded that PNF stretching with CR technique by using submaximal contractions as useful as maximum contraction in developing the range of motion and it might reduce the risk of injury due to the PNF stretching with the maximum voluntary isometric contraction (Felan 2004).

CONCLUSION

PNF stretching exercises with CR technique in the subjects of the study is the useful method to reduce pain, decrease pain trigger points, and increase the range of neck motion in patients with chronic neck pain. So, using this method for people who suffer from chronic neck pain caused by trigger points is recommended.

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