

Effect of Stretching Exercise on Cervical ROM in Elderly

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노인환자의 스트레칭 운동이 목 가동범위에 미치는 영향

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<Abstract>

목적 : 이 연구의 목적은 스트레칭이 노인의 경부 통증과 관절가동범위에 미치는 영향을 알아보는 데 있다.

방법 : 치료에 따른 전, 후 경추 굴곡 신전 패턴을 이용한 스트레칭이 목의 관절가동범위 변화와 통증변화에 미치는 영향을 알아보기 위해 20명(남자 10명, 여자 10명)을 대상으로 치료 전, 치료 4주 후에 얻은 측정치를 대응 t-검정을 사용하여 분석하였다.

결과 : 치료 4주후 통증수치, 경추 관절 굴곡, 신전, 좌회전, 우회전 변화는 유의한 감소를 보였다.

결론 : 스트레칭이 노인 경부근막동통증후군 환자의 관절가동범위 증가와 통증 감소에 효과적이라는 것을 확인하였다.

핵심단어 : 신장, 근막동통증후군, 경부통

I. INTRODUCTION

As of year 2000, Korea has become the aging society since the number of people aged over 65 in Korea is now approximately 3.37 million which is over 7.1% of the whole population. In 2019, the

rate of the elderly is estimated to double up to 14.4% and Korea will enter the aged society. (National Statistical Office, 2001).

Aging in general refers to the physical imbalance and gradual resistance of the body structure and function that makes it difficult to adopt to the

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internal and external environment(Bae, et al., 1996). As aging process advances, not only all the functions but also the range of motion decreases as well(Kim & Shim, 1996; Engsborg, et al., 1993). Among those aging people, the number of people with neck pain is now increasing and neck pain is becoming a problem as serious as the back pain(Park, 2000).

If neck pain is not properly treated when it is limited only in the neck area, it spreads to the lower parts such as back, arms and even fingers. Or, it causes pain in upper part of the neck such as pain in the back of the head, migraine, dizziness and tinnitus(Lee, 1999). Therefore, many scholars recommend low-intensity stretching that is interesting and easy to do in order for the elderly to prevent their joints from declining and maintain their flexibility and strength of their joints to a certain level(Kim et al., 1995; Chappellear, et al., 1985).

Stretching activities are effective for musculoskeletal system disorders since it increases the coordination between the nerve muscles and reduces the pain in the muscles that are overused(Sun & Park 1997).

The fundamental principle of stretching is to expand the muscles more than the normal status by extending the length and it should be extended more than 10% compared to the natural length in order to improve the flexibility. When moving the fingers, actual resistance of the tissues can be felt while superficial tissues are adhered to the deep tissues and this is how mobility of the tissues in the area is increased(Park & Park, 2005; Bae, et al., 2002; Kim & Kim, 2002).

Static stretching which is the most-generally used method among all the stretching methods is to gradually and slowly extend the muscles and joints to the maximum and stay at that point for about five to ten seconds. It is also called 'Slow stretch' and it has been used for a long period of time. It is known to be effective in increasing the flexibility

(Lee & Jo, 2005).

For elderlies, stretching not only increases the flexibility but also relieves the tension in the muscles and prevents muscles from adhering too much. In addition, it expedites blood circulation and respiratory functions and improves environment adaptability(Park & Park, 2004).

Therefore, the purpose of this study is to properly and safely adopt cervical motion using the stretching exercises to the elderly patients with neck pain and identify the changes in cervical angle and pain before and after the treatment.

II. METHODS

1. Subject

The subjects of this study are twenty patients with myofascial pain syndrom who are in their 70s and 80s and went through the physical therapy sessions from March 2008 to May 2008 in 'H' hospital located in Namhaegun, Kyeongsangnamdo. Average age of 20 volunteers(10 male, 10 female) is 73.30 ± 6.38 .

The subjects were neck pain patients in the subacute stage without other ailments such as herniated intervertebral disc, spondyloarthropathies and past surgical operations. The subjects were able to fully understand the directions from the researcher and provide full cooperation.

2. Method of experiment

They were classified randomly and treated three times a week with 15 minutes of hot pack, 10 minutes of ultrasonic waves and ten minutes of transcutaneous electrical nerve stimulation and stretching activities. The ultrasonic wave treatment was provided as 1MHz, $1.5W/cm^2$ 12 times in 4 weeks. The part treated was the trapezius muscle.

Before measuring the angle, they were told to do a light exercise that will not affect the results. They were also told to mark on the visual analogue scale: VAS every time they are measured for pain evaluation.

The maximum scale was 10 and minimum was 0.

3. Data Analysis

SPSS(12.0 for Window) was used for the analysis and t-test was used as the statistic analysis to identify the changes in neck pain and cervical angle after four weeks of stretching treatment.

III. RESULT

1. The change of the pain

In terms of the changes in the pain along with the period of stretching treatment, the average and standard deviation was 6.05±1.64 and changed to 3.25±1.92 after four weeks of treatment which showed significant difference. The average difference between before and after the treatment was(p<.00) and it also showed statistically significant difference

Table 1. The change of the pain

	VAS scale (mean±SE)	t	p
Pre	6.05±1.64	7.34	.00*
Post	3.25±1.92		

p<0.5

Table 2. The change of the cervical flexion, cervical extension, left rotation, right rotation range of motion

Motion	pre-range (mean±SE)	post-range (mean±SE)	t	p
Flexion	54.35±5.35	55.59±4.62	-2.85	.010*
Extension	61.45±6.28	62.52±5.84	-4.12	.001*
Left Rotation	66.89±5.15	67.64±4.95	-3.55	.002*
Right rotation	66.50±4.72	67.35±4.48	-4.20	.000*

p<.05

(p<.05)<Table 1>.

2. The change of the cervical flexion, cervical extension, left rotation, right rotation range of motion

In terms of the changes in the flexion along with the period of stretching treatment, the average and standard deviation was 54.35±5.35 and changed to 55.59±4.62 after four weeks of treatment which showed significant difference(p<.05). In terms of the changes in the extension along with the period of stretching treatment, the average and standard deviation was 61.45±6.28 and changed to 62.52±5.84 after four weeks of treatment which showed significant difference(p<.05).

In terms of the changes in the Left Rotation along with the period of stretching treatment, the average and standard deviation was 66.89±5.15 and changed to 67.64±4.95 after four weeks of treatment which showed significant difference(p<.05). In terms of the changes in the right rotation along with the period of stretching treatment, the average and standard deviation was 66.50±4.72 and changed to 67.35±4.48 after four weeks of treatment which showed significant difference(p<.05) <Table 2> <Fig. 1>.

IV. DISCUSSIONS

The positive effects of stretching can be understood in the same context with many studies

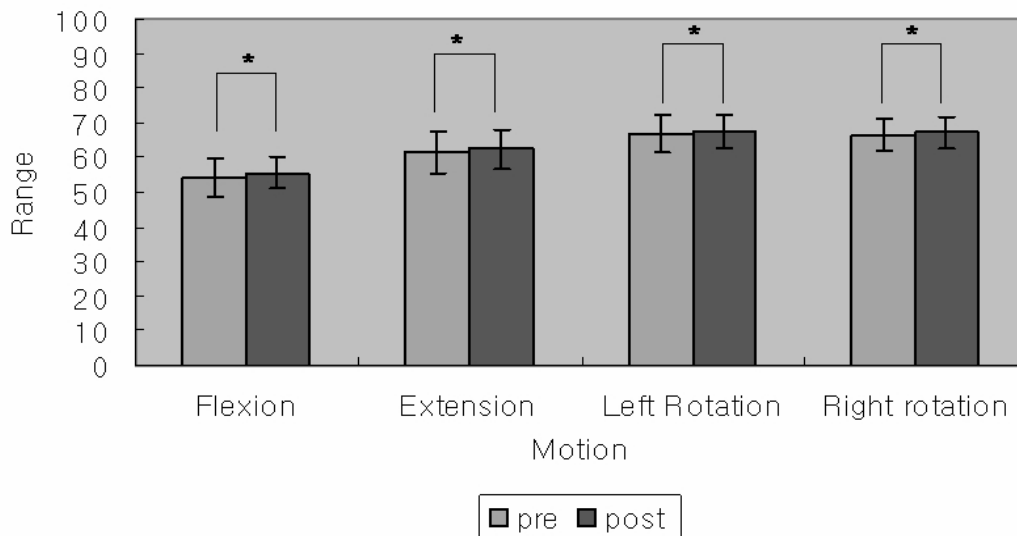


Fig 1. The change of the cervical flexion, cervical extension, left rotation, right rotation range of motion

(Worrel, et al, 1994; Godges, et al, 1993) on accidental training effective in muscle functions, range of motion and performance of the elite athletes.

Oddis(1996), Krug, et al.(1994) recommended stretching as the exercise to increase the range of motion and as the method to prevent arthritis.

In this study, among the twenty patients in their 70s and 80s with myofascial pain syndrom, ten of them were males and ten were females which had no significant statistically difference by the gender.

In this study, an experiment was conducted to examine the effects of stretching. The pain and range of motion was measured before and after the four weeks of treatment.

As a result, level of pain was 6.05 ± 1.64 before the treatment and 3.25 ± 1.92 after the treatment which showed statistically significant reduction.

In the studies done by Revel, et al(1994) and Kim(2003), the group treated with sports therapy had significant improvement in the pain. This study showed similar results.

Stretching increases the strength and flexibility of

the joints while reducing the muscle tone and adhesion, expedites blood circulation, improves environment adaptability and increases range of motion. Regular and low-intensity stretching exercises are being recommended(Chappelear & Landin, 1985).

Anderson(1990) mentioned that stretching is very effective in increasing the range of motion, relaxing both mentally and physically and preventing damages such as rupture of the muscles. He also pointed out that stretching has advantage of helping the body coordination, improving the perception, expediting blood circulation and increasing the flexibility.

The results of the comparison in flection, extension, left turn and right turn after the treatment are as follow. The flection was 54.35 ± 5.35 before the treatment and changed to 55.59 ± 4.62 after four weeks. The extension was 61.45 ± 6.28 before the treatment and changed to 62.52 ± 5.84 after four weeks. The left turn was 66.89 ± 5.15 before the treatment and changed to 67.64 ± 4.95 after four weeks. The right turn was 66.50 ± 4.72 before the treatment and changed to 67.35 ± 4.48 after four

weeks. All of those showed significant difference.

In the biomechanic aspect, stretching changes the characteristics of viscoelasticity in the muscle fibers and increases the body flexibility by changing the length of the fibers. It reduces the damage in skeltal muscles and relieves the anxiety and depression for those suffering from the pain. Therefore, stretching is recommended during the rest time in work(Ku, et al, 2003) since it satisfies psychological needs and provides stability (Nicolakis, et al, 2002).

Toilson and Michael(1998) mentioned that exercise can have indirect effects as well by reducing the stress, chronic muscle pains that patients had before. This results were as same as the study done by Burkner and Khan(1993) that stretching therapy was effective in increasing the range of motion.

By the results of this study, it is confirmed that stretching is effective in increasing the range of motion and reducing the pain for patients with myofascial pain syndrom. Therefore, the therapists should develop various techniques by making the best efforts and learning the patterns in order to have the maximum effects for the patients.

V. CONCLUSION

The present research investigated 20 patients with neck myofascial syndrome, dividing them into a doing of stretching. This study examined degree of recovery from neck pain by comparing their neck myofascial pain syndrome before and after the treatment, and compared to find difference in the degree of recovery from myofascial pain syndrome.

REFERENCES

Anderson TP. Rehabilitation of patients with complete stroke, In Kottke FJ Lehmann JF(eds):Krusen's handbook of physical medicine and rehabilitation, ed 4. philadelphia: WB Saundes Co. 1990;656-78.

- Bae SS, Choi JW, Lee KH, et al. Diagnosis and Treatment of Connective Tissue Massage. The Journal of Korean Society of Physical Therapy. 2002;14(4):231-9.
- Burkner P, Khan K. Clinical Sports Medicine. Mc Graw-Hill Book Company. 1993.
- Chappelear J, Lindin RJ, Linnemeier TJ, et al. Exercise testing and training of the elderly patient. Cardiovasc Clinic. 1985;15 (20):201-18.
- Engsborg JR, Grimstom SK, Hanley DA, et al. Differences in ankle joint complex range of motion as a function of age, The Foot Ankle, May, 1993;14(4):215-22.
- Godges, JJ, Macrae, PG, Engelke KA. Effects of exercise on hip range of motion, trunk muscle performance, and gait economy. Physical Therapy. 1993;73:468-77.
- Kim, HJ. The Effects of Joint Mobilization on Neck Pain. Daegu University. Graduate School of Rehabilitation Science. 2003.
- Krug HE, Mahowald ML, Yetterberg SR. Exercise for arthritis. Ballieres Clinical Rheumatoid. 1994; Feb,8(1):161-89.
- Hwang JY, Shim DW, Kim WS. Measurement on the sargent jump of Decade in Korea. The Korean society of sports medicine. 1996;14(1):208-15.
- Kim JI. 30 Days method by stretching diet. Ilsong-media. 2002.
- Kim JT. Power up stretching diet by photo. Seoul; Samhomedia. 2002.
- Kim MH, Kim YS, Kim EH, et al. An exercise program to improve fitness and health of the elder. report on athletics and science research. 1995;1-45.
- Lee HH. The effects of Evjenth-Hamberg stretching on range of motion of knee joint and isometric, isokinetic muscle strength. The Graduation School of Education Yonsei University. 2003.
- Lee HS, Cho BM. Korea society of Sports and Leisure studies. 2005;23:379-90.

- Lee SH. Cervical intervertebral Disc Herniation. Yeuleumsa. 1999.
- National Statistical Office. A report on population of world and Korea Seoul. Korea. 2001.
- Nicolakis P, Erdogmus B, Kopf A, et al. Effectiveness of exercise therapy in patients with myofascial pain dysfunction syndrom. J Oral Rehabil. 2002; 29(4):362-68.
- Oddis CV. New perspectives on osteoarthritis. American Journal of Medicine, 1998;9(1):187-211.
- Park HJ. Job pain according to Jobs. 2000;69: 12-5.
- Park HS, Park TS. The comparison of stretching for prevention of shoulder disease in elders. The korean journal of physical education. 2005;44(1) 675-81.
- Park HS, Park TS. The comparison of stretching techniques on the range of motion in elders. journalof physical growth and motor development. 2004;12(3)63-9.
- Revel M, Minguet M, Georgoy P, et al. Changein cervicocephalic kinesthesia after a proprioceptive rehabilitation program in patients with neck pain. a randomized controlled study. Arch Phys Med Rehabil. 1994;75:895-9.
- Shankar K. Exercise Prescription. The publishing company Youngmoon. 2001.
- Sun OS, Park SJ. Basic Fitness Q&A for a coach. The publishing company. HongKyeong. 1997.
- Toilson CD, Michael LK. Physical exercise in the treatment of low back pain. part I: A review Orthop Rev. 1998;17(7):724-8.
- Worrel TW, Smith TL, Winegardner J. Effect of hamstring stretching on hamstring muscle performance. J Orthop Sports Phys Ther. 1994; 20:154-9.