The Effects of Self Stretching on Patients with Cervical Pain

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Purpose The present study aimed to investigate the effects of stretching on the range of motion and pain in the neck and to present an effective stretching technique. ***Methods*** The subjects of this study were 17 adult in South Korea. Measurements of ROM, VAS, RAC of neck were taken prior to the program, in the 8th weeks(3 time/week) after the neck stretching training program was finished, and after the program. CROM Instrument(C5060, Performance Attainment Associates) was used for measuring the range of motion in the neck. Neck pain was measured as the pressure threshold by using the VAS and REMANUFACTURED ALGOMETER COMMANDER(RAC). ***Results*** Neck range of motion showed a significant increase in flexion in the standing position($p<0.05$), but the other categories did not show any significant differences($p>0.05$). Neck pain showed a significant decrease in the VAS($p<0.05$). RAC showed a significant increase in left SCM($p<0.05$) and significant decrease in right supraspinatus($p<0.05$), but the other categories did not show any significant differences($p>0.05$).

Key words CROM, VAS, RAC, Stretching

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I. Introduction

Neck pain is a general symptom that occurs in more than two-thirds of the population, more commonly in adolescents and adults.[1)] Despite complaints of neck pain and restricted movement, people do not aggressively treat the condition, which consequently causes social and financial loss.[2)] Therefore, a simple treatment technique that anyone can use, regardless of time and place, is needed.[3,4)]

Universal treatment methods for neck pain include heat therapy, traction therapy, active exercise, joint mobilization, stretching exercises, isometric muscle strengthening exercises, endurance exercises, and proprioception exercises [5,6)] In particular, stretching is the most fundamental, yet most effective, treatment approach for joint contracture and pain.[7)] Stretching increases blood flow, eliminating fatigue-causing substances and alleviating pain, and helps to relax and strengthen muscles that have not been used for a long time.[8)] Moreover, because stretching does not require high physical skills or special equipment, anyone—male or female, young or old—can perform it. As it does not have to be forced or does not entail high costs, it can be performed easily, without the burden of time and place.[9)]

The present study aimed to investigate the effects of stretching on the range of motion and pain in the neck and to present an effective stretching technique.

II. Materials and Methods

1. Subjects

The subjects were selected the top 17 people through VAS and FABQ (fear-avoidance beliefs questionnaire). General characteristics of the study subjects are as shown in Table 1. Measurements of ROM, VAS, RAC of neck were taken prior to the program, in the 8th weeks(3 time/week) after the neck stretching training program was finished, and after the program.

Table 1. General characteristics of the subjects

	mean±SD (M=6, F=11)
age	20.71±0.59
height(cm)	165.65±9.21
weight(kg)	61.35±9.15

2. Methods

CROM Instrument(C5060, Performance Attainment Associates) was used for measuring the range of motion in the neck. Flexion and extension in the standing position, and flexion, extension, rotation, and lateral flexion in the sitting position were recorded as active range of motion of the joint.

Neck pain was measured as the pressure threshold by using the visual analogue scale (VAS) and REMANUFACTURED ALGOMETER COMMANDER(RAC, JTECH Medical). During the measurement of pressure threshold, pressure was applied vertically to the active pain triggering point located in the sternocleidomastoid (SCM) and trapezius. When the subject gave a verbal signal in the form of an "Ah," the value at that point was recorded.

The study subjects performed active self-stretching on their neck. Accurate movement was demonstrated, and training was conducted until proper movement had been learned. Details of the stretching method are shown in Table 2. Stretching was performed slowly, and the final position was held for approximately 10 seconds.

The results of this study were processed using SPSS 12.0. Wilcoxon signed-rank tests were used to analyze the results in order to examine the changes in ROM, VAS, RAC of neck; the significance level was set to $\alpha<0.05$.

III. Results

1. Changes in the ROM of Neck

Neck range of motion showed a significant increase in flexion in the standing position($p<.05$), but the other categories did not show any significant differences($p>.05$). (Table 3)

Table 2. Stretching method

Stretching region	Method
cervical stretching	lateral rotation
	diagonal flexion
	flexion
	extension
	lateral rotation
	flexion maintain
	extension maintain Ⅰ
	extension maintain Ⅱ
shoulder stretching	deltoid posterior stretching
	serratus anterior stretching
	triceps stretching
	pectoralis major stretching
	levator scapula stretching
	fold one's hands behind the neck

2. Changes in the pain of Neck

Neck pain showed a significant decrease in the VAS($p<.05$).

RAC showed a significant increase in left SCM ($p<.05$) and significant decrease in right supraspinatus($p<.05$), but the other categories did not show any significant differences($p>0.05$)(Table 4).

IV. Discussion

The present study aimed to investigate the effects of stretching on the range of motion and pain in the neck and to present an effective stretching technique.

The stretching method proposed in the present study included stretching of the shoulder area. This was based on the fact that neck pain can cause pain and restricted movement in other body parts such as the arms and that aligning the shoulder area can have a positive effect on neck pain.[10)]

The intervention method used in the present study was an active stretching technique that involved neck movements, on the basis that passive stretching by therapists or of other parts of the body has a negative effect on increasing neck range of motion and alleviat-

Table 3.

		mean±SD		z	p
		pre	post		
standing	flexion	22.176±8.172	34.118±13.238	−2.842	.00
	extension	20.353±5.396	25.529±11.737	−1.321	.18
sitting	flexion	51.118±14.335	53.882±14.739	−.853	.39
	extension	68.118±13.573	60.412±13.271	−1.801	.07
lateral flextion	left	37.706±8.260	39.412±9.559	−.595	.55
	right	43.118±8.123	40.235±8.743	−.742	.45
rotation	left	56.353±7.115	54.471±8.048	−.713	.47
	right	61.412±6.114	59.059±10.957	−.687	.49

*p<.05

Table 4.

		mean±SD		z	p
		pre	post		
VAS		5.880±1.533	5.230±1.623	-2.223	0.26
SCM	left	2.876±1.186	4.241±1.579	-2.463	0.01
	right	3.247±1.033	4.494±1.732	-1.8	0.07
Trapezius	left	5.035±3.257	6.253±3.606	-1.35	0.17
	right	4.888±2.445	6.318±1.971	-1.862	0.06
Supraspinatus	left	6.312±3.081	6.124±3.328	-0.474	0.63
	right	7.706±2.800	6.447±2.983	-1.965	0.04

*p<.05

ing neck pain.[11)]

Moreover, the neck stretching technique presented in this study involved stretching in all directions, based on the fact that neck structures are in a position that enables complementary movements in each direction. That is, when a side is flexed, the opposite side must be extended.[12)] Accordingly, all the study subjects were instructed to stretch in all directions, regardless of the pain area.

In the present study, the neck range of motion showed a significant increase in flexion in the standing position($p<0.05$), but the other categories did not show any significant differences($p>0.05$). In regard to this, Morgan and Proske[13)] indicated that continuous stretching can sometimes not have a major effect on range of motion. Moreover, we believe that because the subjects in the present study were in their 20s, they did not exhibit much restriction in their neck range of motion.

On the other hand, the effect of neck stretching was significant, according to the VAS pain score. Although the subjects in the present study were selected for having overall neck pain and were not distinguished based on whether the pain was induced from certain diseases, we believe that active self-stretching can have a universal effect. With regard to changes in pain threshold, no significant differences were observed in any of the categories, except for the SCM left and supraspinatus right. In the supraspinatus right, the measured values actually showed a significant decrease, resulting in the complaint of pain at even weaker pressures ($p < 0.05$). In regard to this, Marshall et al[14)] stated that stretching elicited no changes in tolerance for stretching defined according

to pain severity. It was further stated that uncontrolled stretching can actually cause problems associated with changing the mechanical properties of muscle function. In addition, some studies indicated that repetitive stretching cannot be viewed as effective for stiffness or extension, and can even reduce muscle strength, which is similar to the findings in the present study.[15] Besides that, we believe that because the subjects in the present study were not distinguished according to the part of the neck that caused the neck pain.

In the present study, subject selection was limited to those in their 20s and the number of subjects was small, which made the findings unfit for generalization. However, the present study is significant in that it presents a universal stretching technique for neck pain, which occurs often even in persons in their 20s, that anyone can perform easily, and some of its effects.

The present study aimed to investigate the effects of stretching on the range of motion and pain in the neck and to present an effective stretching technique. Measurements of ROM, VAS, RAC of neck were taken prior to the program, in the 8th weeks(3 time/week) after the neck stretching training program was finished, and after the program.

1. Neck range of motion showed a significant increase in flexion in the standing position($p<0.05$), but the other categories did not show any significant differences($p>.05$).
2. Neck pain showed a significant decrease in the VAS($p<.05$). RAC showed a significant increase in left SCM($p<.05$) and significant decrease in right supraspinatus($p<.05$), but the other categories did not show any significant differences($p>.05$).

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