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The Effects of Myofascial Release Massage on Arteriosclerosis Level Index in Elderly Women

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Abstract

Background/Objectives: This study aimed to investigate the changes in arteriosclerosis level index of elderly women after 8 weeks of myofascial release massage. Hence, experimental group and control group were set to compare the effects of treatment. **Methods/Statistical Analysis:** The massage sessions were 3 times a week for 8 weeks counting total of 24 sessions. Myofascial release massage was pushing, rubbing, massaging, shaking, traction. Analysis was performed using SPSS for Windows 18.0 Version. **Findings:** Among the factors related with arteriosclerosis level index Cardio Ankle Vascular Index (CAVI), R-cavi showed significant interaction effect between EG and CG with p<.05. L-cavi showed significant interaction effect between EG and CG with p<.05. Among the factors related with arteriosclerosis level index ABI, R-abi showed significant interaction effect between EG and CG with p<.05. L-abi showed significant interaction effect between EG and CG with p<.05. **Application/Improvements:** Through this process, arteriosclerosis such as CAVI and ABI showed interaction effects. Myofascial release massage showed positive effect on the arteriosclerosis level index of elderly women.

Keywords: Ankle Brachial Index (ABI), Arteriosclerosis Level Index, Cardio Ankle Vascular Index (CAVI), Elderly Women, Myofascial Release Massage

1. Introduction

Medical technology enabled us to extend one's life and this caused aging population to be a social problem not only in Korea but also globally.

According to the 'world health statistics report 2013' by the World Health Organization (WHO), the average life span of Korean men being 77 and the average life span of Korean women being 84, Korean women lives seven more years than Korean men. From this, the component ratio of the women older than 65 was 13.1% in 2010 and it is expected to increase by 26.7% in 2030, 40.4% in 2050. In addition, according to the report in 2011 the life expectancy of the Korean men older than 65 being 17 years and the Korean women being 22 years, women's life expectancy is shown to be higher than that of men[1].

It is thought to exert negative effects due to the decrease of physical activity, imbalance of nutrient intake, change of hormones by the menopause, and change of body structure caused by aging[2].

In the stage of elderly, as the overall physical functions decline, one gets hyperpiesia, diabetes, and chronic illnesses related with heart and lung. In this case, one gets into a severe condition frequently due to just a minor cause. Also, it is easy to get or be exposed to any disease by long-time fatigue and decrease of adaptability which are caused by lack of natural recovery function[3].

In the case of elderly women, they experience symptoms such as osteoporosis, arthralgia, headache, fatigue, lethargy, mood swings, and depression related with a rapid decrease of the estrogen amount and a change of the endocrine system after reaching menopause[4].

One of the ways to improve the body's functional movement is the myofascial release therapy and the fascia is a strong three-layered organic connective tissue. Fascia is closely connected with the body's organic movement in

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that the body can maintain its shape even after removing all the body parts except the fascia[5].

The myofascial release therapy cures the disorder of the fascia structure through an indirect technique. It is a treatment that helps the fascia to recover to its original shape by promoting the balance of the autonomic nervous system. The balance is promoted through regaining the balance between the nerves and musculature and stimulating the parasympathetic nerve[6].

After menopause, women experience physiological change and reduction of generation and functions of immunity substances. Aging, change of hormones, conflict according to change of role, and various life events influence mental adaptation abilities in which more physical changes than men are experienced. These physical changes are shown along with obesity and become the main factors of adult diseases.

Exercise therapy, behavior modification therapy, operation therapy, and drug therapy are used for health improvement, but they are not easily sustained for long periods in which there is an aspect that only partial advantages are emphasized. Various massage methods in the aspect of beauty and health are recently being introduced and interest on the effects are increasing.

In this study, myofascial release massage is applied to investigate the influence on arteriosclerosis level of elder women.

2. Study Methods

2.1 Subject of Study

The research subjects were elderly in 65s living in Gyeonggi-do Korea who does not exercise regularly, do not take dietary supplement, and wish to attend 8 weeks of myofascial release massage program. The Experimental Group (EG) participates in the myofascial release massage whereas Control Group (CG) does not participate in the treatment program of this study. Seven subjects were assigned to each group but one subject from CG quit from the program. Therefore, total of 13 subjects participated in this program. Individual traits of the participants can be seen in Table 1.

2.2 Treatment Program

The myofascial release massage was performed for a total of 24 sessions 3 times a week for 8 weeks each of 40 minutes. The myofascial release massage was performed classified into laying down posture and lying down posture.

Table 1. Physical characteristic of the subjects

	Experimental Group(n=7)	Controlled Group(n=6)
Age(yr)	69.01±2.14	68.66±2.58
Height(cm)	152.11±3.33	152.50±3.25
Weight(kg)	61.85±4.89	61.54±4.20

Pushing, rubbing, massaging, shaking, and traction were performed in order focusing on the spine in which low pressure was started and intensity was increased to optimum pressure (Table 2).

After the myofascial release massage, subjects rested on the massage table for 5 minutes.

Table 2. Myofascial release massage program

Detailed classification	Massage Program
Initial (5±2min)	Spine/Abdominal Core muscle Kneading, Wrining, Tapotement, Compression
Medium-term (20±5min)	Spine/Abdominal Core muscle Kneading, Wrining, Tapotement, Compression, Friction, Petrissage
latter (5±3min)	Spine/Abdominal Core muscle Friction, Petrissage, stroking, Vibration

2.3 Measurement

Level of arteriosclerosis test was conducted between 9-10 AM in empty stomach condition since 22 PM in the previous day. VS-1000 (IMTEC, Korea) was used for level of arteriosclerosis in which they were measured as Cardio Ankle Vascular Index (CAVI) and Ankle Brachial Index (ABI).

2.4 Data Analysis

Predictive Analytics SoftWare (PASW) 18.0 statistical program was used on the pre-test and post-test data to identify the effect of 8 week treatment. Descriptive statistics was suggested for each measurement period and two ways Ronnie Gardiner Method (RGRM), ANalysis Of VAriance (ANOVA) was applied to find the interaction of the treatment effect. The significance level was set to be .05.

3. Results

3.1 Chang of CAVI

The difference of investigation results between the control group and the experimental group can be seen in Table 3. Among the factors related with arteriosclerosis level index CAVI, R-cavi showed significant interaction effect between EG and CG with p<.05. L-cavi showed significant interaction effect between EG and CG with p<.05.

Table 3. Chang of CAVI in after application of myofascial release massage program

Variable	Group	Pre	Post	Interaction (group*period)	
R-cavi	EG	10.21 ± 0.88	9.86 ± 0.93	F=8.097	.016
	CG	10.02 ± 1.20	10.01 ± 0.99		
L-cavi	EG	10.15 ± 1.02	9.37 ± 0.98	F=5.437	.040
	CG	10.01 ± 0.87	10.03 ± 0.93		

3.2 Chang of ABI

The difference of investigation results between the control group and the experimental group can be seen in Table 4. Among the factors related with arteriosclerosis level index ABI, R-abi showed significant interaction effect between EG and CG with p<.05. L-abi showed significant interaction effect between EG and CG with p<.05.

Table 4. Chang of ABI in after application of myofascial release massage program

Variable	Group	Pre	Post	Interaction (group*period)	
R-cavi	EG	2.25 ± 0.20	2.09 ± 0.18	F=5.177	.044
	CG	2.13 ± 0.18	2.14 ± 0.33		
L-cavi	EG	1.93 ± 0.23	1.77 ± 0.15	F=5.428	.041
	CG	1.91 ± 0.22	1.90 ± 0.21		

4. Discussion and Conclusion

In modern society, it is reported that the number one cause of death of the aged is the death related with cardiovascular disease. About 80% of cardiovascular disease is caused by the disorder of arterial function[7]. Low elasticity of blood vessel is closely related with cardiovascular disorders and it can have a highly negative effect if not prevented in early stages, The elasticity of the blood vessel decreases as the age increases[8,9]. According to[10], the decrease in the elasticity of blood vessel increases the myocardial oxygen consumption, decreases the cardiac output, and increases the arterial stiffness. This forms a major cause to stimulate atherosclerosis by applying stress to the artery wall. As the age increases, there is a decrease in the elasticity of blood vessel for both men and women but it is shown that it rapidly decreases in the case of women starting from age 50.

ABI is the value when the systolic blood pressure measured from the ankle is divided by the systolic blood pressure measured from the upper arm. Generally, there is a high possibility of the leg veins being exposed to coronary artery occlusive disease compared to the arms. Limping caused by Peripheral Arterial Disease (PAD) is a major symptom of arteriosclerosis and it becomes a risk factor that causes cardiovascular disorders[11].

CAVI shows the relation between the pressure applied to the artery blood vessel and the blood vessel diameter. It can also easily measure the stiffness of the artery blood vessel walls non-invasively[12].

According to the preceding research about the degree of arteriosclerosis of the aged[13], made a report on the improvement of blood vessel elasticity of elderly women through pilates exercise[14] showed a significantly low rate of arterial stiffness of elderly men through long term regular exercise.

Reported[15] a positive effect on the structure and function of the blood vessel of elderly women through aerobic exercise, anaerobic exercise, and complex exercise[16] reported a positive effect on elderly women through aerobic exercise rather than resistive exercise. Myofascial release therapy is known to help the improvement of physical body type and health. It also helps excrete body wastes by stimulating blood lymph circulation intenerate the movement of the muscles, joints, and chords, and is effective for curing chronic fatigue and muscle fatigue[17]. This research showed to have a positive effect on elderly women through 8 weeks of myofascial release massage with an interactive effect in ABI and CAVI. This cause

makes the blood vessel expand due to the increase of the blood flow and blood vessel pressure[18,19].

In addition, it brings activation of the sympathetic nervous system, making the sympathetic nervous system more stable after taking exercise than before so it corresponds with the research on the positive effect of the blood vessel elasticity. Therefore, as well as any exercise, myofascial release massage is thought to have a positive effect on the blood vessel elasticity.

According to[20] senior citizens of 65 years or older are physically weak and have high possibility of occurrence of chronic diseases such as hypertension, diabetes, cardiac diseases, dementia, and cancer that quality of life is lowered in which it is rising as a severe social issue.

Especially, it is not easy for senior citizens with uncomfortable physical activities to improve health through exercise. In this aspect, it is judged that the health improving method using massage will have meaning of physical activity more than exercise. It is considered that the positive improvement of arteriosclerosis index through myofascial release massage has significance.

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