



The Effect of Court-Type Thai Traditional Massage on Delayed-Onset Muscle Soreness in The Biceps Brachii Muscle After Resistance Exercise

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ABSTRACT

Introduction: Delayed onset muscle soreness (DOMS) when they perform a different type of sport or practice new skills. DOMS is different from the acute pain experienced during and shortly after exercise. It usually appears after a pain free period (12–24 h), peaks at 24–72 hours and disappears within 7 days of the exercise.

Objective: To investigate the Effect of Court-Type Thai Traditional Massage (CTTM) on DOMS in The Biceps Brachii Muscle After Resistance Exercise.

Methods: Mae Fah Luang University student female, aged 18-22 years, 30 people. This was a Randomized Control Trial study. The volunteers were divided into 2 groups, the first group was a Court type Thai massage experiment with 15 people and the second group was a control group of 15 people. The subjects tested the Visual Analogue Scale (VAS), Range of Motion (ROM) and swelling were measured before, immediately and 24, 48 and 72 hours after the exercise.

Results: The results showed by comparing the differences between the groups, it was found that there was a statistically significant decrease in pain level ($p < 0.05$) at 48 hours. Range of motion of the experimental group there was statistically increased ($p < 0.05$) at 72 hours. The swelling of the muscles was not statistically in both groups and between groups.

Conclusion: CTTM can help muscles relax, reduce muscle contraction and reduce DOMS symptoms after resistance exercise. which shows that the CTTM after the experiment in the experimental group, VAS was lower than the control group and increased range of motion.

Keywords: Court-Type Thai Traditional Massage (CTTM), delayed onset muscle soreness (DOMS), Biceps brachii

Introduction

Delayed onset muscle soreness (DOMS), also known as muscle fever, is a type of muscle strain injured is resulted in muscles had tenderness and stiffness. Most of the time, this condition occurs asymptotically, and tenderness tends to occur in the extremities of the muscles. The muscle pain receptors are located at the junction of muscles and tendons; difficulty moved pain occurs only when moved. The pain was present for the first 8-24 hours and the pain worsened after 24-72 hours after the exercise. Will had pain when touched the area.

There is stiffness, swelling and muscle weakness, etc. Symptoms last up to 96 hours (4 days) or more, and disappeared on their own, after 5-7 days of exercised is stopped depended on individual performance [1]. Treatment and prevention of DOMS, such as cold therapy with ice compress it would help reduced the inflammatory processed and swelled [2]. Stretched by warming up before exercise. Increased muscle flexibility and jointed range of motion would have a positive effect on reduced muscle spasm and increased blood flow [3]. Sports massage is popularly applied to

pained of DOMS is the Swedish massage used petri technique. Petrissage technique because it is a technique in the manner of pressed and released (Compression & Decompression) accorded to the pressure given to reduced pained swelled that occurs and increased blood flow, anti-inflammatory drug, ultrasound, electrical current techniques and homeopathy [4].

Court type Thai traditional massage (CTTM), Thai named Nuad Raja Sum Nak, is a practice of Thai traditional medicine. CTTM is a wisdom that has been passed down for a long time. Especially the group of diseases related to muscles, the massage used fingers and hands to massage the body according to the science and art of Thai traditional medicine that had been practiced in CTTM for therapeutic, disease prevention, rehabilitation. Helps relax muscles. This would be a good result in the treatment of pain, stiffness, fatigue in various parts of the body, reduced pain and swelling, etc. The benefits of CTTM, such as help the muscles relax and reduces muscle spasms, reduce muscle swelling, helps weaken the fascia, making the muscles more flexible and help to relax and relieve stress [5]

Therefore, the researcher is interested in studying the effects of CTTM on DOMS in the Biceps brachii muscle after resistance exercise because there are no research studies in this area. To be a guideline to fully rehabilitate the muscles after the next exercise as well as the integration of Thai traditional medicine in order to further disseminate wisdom.

Methodology

Participants

This study was approved by the Mae Fah Luang University Ethics Committee on Human Research (NO.EC-22029-25). This study was a clinical trial. This was a randomized compared study with a randomized control trial. Mae Fah Luang University student female, ages of 18-20 years, 30 people. The number of subjects was determined by a G*Power program, and the t-tests group data entry model was analyzed by means of the difference between two independent means (two groups). The effect size (effect size f) calculated from the above study was 1.09, which determined a confidence level of 95% and a power of the test (power of test) 80%. Total sample size: 30 people.

Inclusion Criteria

- Mae Fah Luang University students female, aged between 18-22 years
- Do not exercise regularly about using the arm area.
- Never received massage therapy before for at least 1 month.
- There are no contraindications to massage, fever above 38.5 degrees Celsius, high blood pressure of more than 140/90 millimeters points.

Exclusion Criteria

- The volunteer had symptoms related to disease in the jointed tendon or muscle which affects the inability to exercise according to the prescribed program.
- The volunteer was injured during the exercise program.

Experimental Design

This study was a clinical trial. This was a randomized compared studied with a randomized control trial. The volunteers were divided into 2 groups, the first group was the CTTM experiment and the second group was the control group the details are as follows. The first group, the experimented group, received a CTTM. The duration of the massage is 30 minutes. The second group was the control group. The volunteers were given bed rest and self-cared education for anterior forearm pain after resistance exercised.

The subjects tested the Visual Analogue Scale (VAS), Range of Motion (ROM) and swelling were measured at before the experiment, immediately and 24, 48 and 72 hours after the exercise.

Exercise

The armed training Scott-curl program causes muscle soreness on Biceps brachii. All volunteers performed eccentric exercise of biceps brachii muscles using a preacher curl bench. Weight of the dumbbell was 80% of the pre-exercise MIF. Place the upper arm on the cushion wider than your shoulders. By placing the elbows against the cushion. The volunteer lift the dumbbell from the elbow elastic to the elbow extension position and holds it for 5 seconds. Repeat 20 times, count as 1 set, do 3 sets.

Statistical Analysis

All analyses were performed using program SPSS for windows. Mean and the standard deviation (SD). Paired t-Test to compare the difference of the test resulted between the groups. Repeated measured to compared the differences of the test resulted within the group. Test for statistical significance at the 0.05 level.

Results

In a study on the Effect of Court-Type Thai Traditional Massage on Delayed-Onset Muscle Soreness (DOMS) in The Biceps Brachii Muscle After Resistance Exercise. A total of 30 volunteers were tested in both groups, including the Court type Thai Traditional massage group and the control group, 15 people each, as shown in table 1.

Table 1 General characteristics of participants

Volunteer attributes	Experimental group (n=15)	Control group (n=15)	P- value
Age (years)	20.80±0.91	21.10±1.10	0.39
Weight (kg)	58.85±8.48	57.30±10.70	0.66
Height (cm)	159.85±4.42	158.90±5.32	0.83

The VAS scores of the experimental group and the control group after massage (48 hrs.) were significantly different ($p<0.05$) as shown in figure 1.

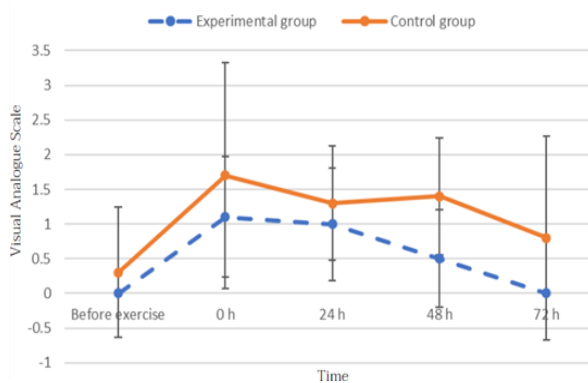


Figure 1 Comparison of VAS scores between experimental and control groups, *($p<0.05$).

Range of motion (ROM) values between the experimental group and the control group after massage there were no significant differences as shown in figure 2.

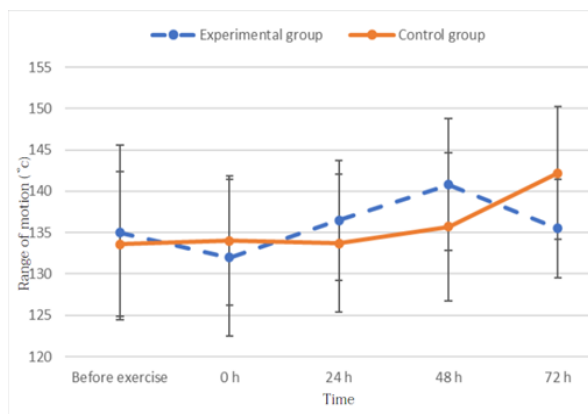


Figure 2 Comparison of ROM between experimental and control groups.

Swelling between the experimental group and the control group (72 hrs.) were not significantly different as shown in figure 3.

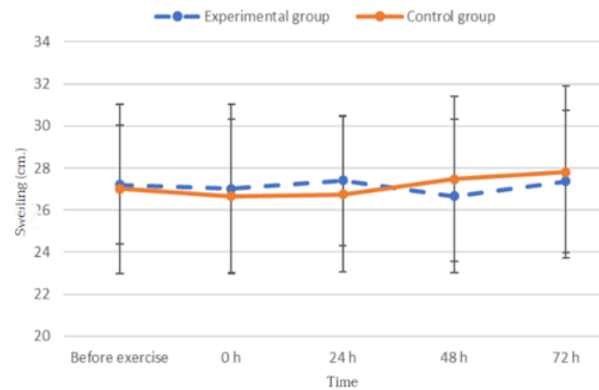


Figure 3 Comparison of Swelling between experimental and control groups.

The pain level of the experimental group and the control group showed that after massage VAS of the two groups there was no difference within the group, as shown in table 2. The ROM of elbow flexion between experimental and control groups. It was found that after massage ROM of both groups was not statistically different and there was no difference within the group. The range of motion of the experimental group's elbow flexion was increased after massage, as shown in table 3. The swelling of muscle between the experimental group and the control group found that the swelling after massage in both groups There were no statistically significant differences within and between groups, as shown in table 4.

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Table 2 Comparison of VAS values within the experimental and control groups

Period	Pain Scale (VAS)				
	Before	After			
		0 hr	24 hr	48 hr	72 hr
Experimental group (n=15)	0.00±0.00	1.10±0.87	1.00±0.81	0.50±0.70	0.00±0.00
Control group (n=15)	0.30±0.94	1.70±1.63	1.30±0.82	1.40±0.84	0.80±1.47

Table 3 Comparison of ROM of elbow flexion within the experimental and control groups

Period	Range of motion (ROM)				
	Before	After			
		0 hr	24 hr	48 hr	72 hr
Experimental group (n=15)	135.00±10.54	132.00±9.48	136.50±7.26	140.80±8.01	135.50±5.98
Control group (n=15)	133.60±8.73	134.00±7.84	133.70±8.35	135.70±8.99	142.20±8.05

Table 4 Comparison of circumference length within the experimental and control groups

Period	Arm circumference length				
	Before	After			
		0 hr	24 hr	48 hr	72 hr
Experimental group (n=15)	27.21±2.84	27.40 ±3.10	27.37±3.38	27.53±2.87	27.44±3.36
Control group (n=15)	27.01±4.02	26.66±3.66	26.74±3.69	27.48±3.94	27.81±4.07

Discussion

VAS of the experimental group and the control group. There was a statistically insignificant reduction. When comparing the differences between the groups, it was found that There was a statistically significant decrease in pain level ($p<0.05$) at 48 hours. ROM of the experimental group there was a statistically significant increase ($p<0.05$) at 72 hours. And the control group When comparing the differences between the groups, it was found that There were no statistically significant differences. In addition, the swelling of the muscles There was no statistically significant in both group and between groups. The mechanisms of massage affect DOMS will reduce emigration of neutrophils and/or higher levels of serum cortisol [6]. Massage therapy after strenuous exercise could be effective for alleviating DOMS and improving muscle performance [7].

Conclusion

CTTM can help muscles relax, reduce muscle contraction and reduce DOMS symptoms after resistance exercise. Which shows that the CTTM after the experiment in the experimental group, the pain level was lower than the control group and increased range of motion. Future studies should include an exercise program that induces the whole arm and should increase the sample size. To support that CTTM can relieve DOMS symptoms after resistance exercise.

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Author contributions

Conceptualization and methodology: C.V., L.K., K.S. and B.S. Visualization: L.K., K.S. and B.S. Formal analysis: C.V., S.K. and T.T. Writing-original draft preparation: C.V., S.K. and T.T.

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