

A comparative study to investigate the effect of myofascial release technique versus cryotherapy for delayed onset muscle soreness in college students

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ABSTRACT:

Myofascial release (MFR) technique is a form of manual therapy that involves the application of a low load, long duration stretches to the myofascial complex, intended to restore optimal length, decrease pain, and improve function. The objective of the study is to investigate the efficacy of myofascial release technique for reducing muscle soreness in comparison with a group receiving cryotherapy application. 36 college students were participated in the study. Group A received MFR and Group B received cryotherapy. Pre and post comparison of pain scores were analysed with the help of outcome measures. Results were analysed to interpret the impact of both the techniques with the analysis of within the group and between the groups. This study results provide the evidence for the myofascial release technique intervention is more effective than cryotherapy intervention for muscle soreness in college students.

Key words: cryotherapy, myofascial release technique, muscle soreness, physical activity, soft tissue release.

INTRODUCTION:

Physical activity has plethora of health benefits. Current generation is keen on gaining the fitness through the exercises. To be fit an individual needs proper training. A sudden and new form of exercise protocol will give stress on the muscles. If the exercise protocol is not well organised or not supervised for the correct direction, will lead to muscle injuries and soreness. Soreness which develops after 12-24 hours of sudden increased physical activity is called as Delayed Onset of Muscle Soreness (DOMS). Pain increases to its peak by 24-72 hours.⁽¹⁾There are many theories which tries to explain the possible causes and development of DOMS. The common proposed mechanism models are muscle spasm, lactic acid, inflammation, muscle damage and enzyme efflux theory are some hypothesized theories. ⁽²⁾Eccentric activities will cause micro trauma. Muscle damage level depends on the intensity of the exercises. DOMS will show up the result in the physical activity performance after induction of DOMS, causes alteration in the muscle sequencing and recruitment. ⁽³⁾

Fascia is a thin and tough structure covered all over the body. The fascial restrictions are observed in many conditions; it will cause tightness, joint restriction, pain and reduces range of motion in the particular region. Myofascial release is one the manual soft tissue mobilization technique helps to treat muscle immobility, trigger point release, fascial restriction. Myofascial release technique can be applied with direct and indirect methods.





Post eccentric activity muscle soreness if observed due to sudden activity.⁽⁴⁾ It causes intra and extra muscular fascial restrictions, leads to muscle function limitation. It shows notable pain, reduction in range of motion and decreased muscle strength. Self-application of myofascial release technique is very popular method of intervention used to enhance the mobility of fascia.^(5,6)

Delayed onset of muscle soreness is very common in people who suddenly start physical activity or changes exercise intensity suddenly. There are many treatment approaches to treat delayed onset of muscle soreness. Rest, cryotherapy, stretching exercises are commonly applied treatment strategies. There is still paucity in the application and immediate effect of treatment for DOMS.

Objective of the study:

The main objective of the study is to find the immediate effect of myofascial release and cryotherapy. The study aimed to compare the efficacy of both the interventions for delayed onset of muscle soreness. Study design: Experimental study design

Sample group: Garden City University students

Sample size: 36 subjects were participated in the current study.

Inclusion and Exclusion criteria: The students who has delayed onset of muscle soreness in quadriceps muscle post exercises were included in the study. 18-30 years age group students were included in the study. Male and female both the gender were part of the study. Students who have soreness in other muscle were excluded from the study. Subjects with back pain, knee pain, neurological conditions, regular exercisers, cardio respiratory conditions were excluded from the study.

Methodology:

This study was approved by Ethical Committee of Garden City University. Sample was collected from the university campus. Before sample selection, from students who were interested to be part of the study, initial physical activity assessment was taken to know their physical activity level. Moderate physical activity students were included in the study. Consent was taken from the subjects. Sample selection was done with simple random sampling method. Randomization software was used to allocate the sample in two groups. Total 36 subjects were included in the study. Participants were blinded of the treatment they received. 18 samples were allotted in each group with the help of randomizer software. Group A has 18samples. This group received Myo fascial release technique. Group B has 18 samples. This group received Cryotherapy application.Pre-test measurements were taken. Two outcome measures reading were recorded, Numeric pain rating scale (NPRS) and Pain Pressure Threshold(PPT). Pre- test and post-test reading of both the outcome measures were recorded. Group A subjects received Myo fascial release technique. The students were first analysed for muscle soreness area. Pre-test readings of NPRS and PPT were recorded before the application of myofascial release technique. For the application of myofascial release procedure, they were positioned in supine lying position. The researcher position was towards the side of leg depending on painful side. Soreness point was identified and marked. Leg is abducted 15 degrees and positioned on the towel roll. Researcher is positioned in walk stance





position. Right hand fist was used to apply the light to intermediate pressure on the painful area. With the hand movement the sore area was glided from inferior to superior area. Subject was instructed to slowly flex the painful leg from the knee extension position towards flexion. Myo fascial release technique was performed for 3-5 minutes.⁽⁷⁾Like this 3 continuous days Myofascial release technique was applied for the subject. After 3 days post-test outcome measures were recorded. NPRS and PPT reading were noted for each subject.

Group B subjects received cryotherapy application. The students were first analysed for muscle soreness area in supine position. Pre-test readings of NPRS and PPT were recorded before the application of cryotherapy. Assessment of painful area was done to mark the area. Then ice pack was wrapped in the towel was applied on the painful area for 5 minutes. After 5 minutes ice pack was removed.⁽⁸⁾ Like this, 3 continuous days cryotherapy application was done. After 3 days post-test outcome measures were recorded. NPRS and PPT reading were noted for each subject. After interventions post-test readings were collected. Follow up data was collected after one week of post-test.



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RESULTS:

Data was analysed with the help of SPSS software, in version 22.0. The raw data was categorised analysed first for descriptive statistics parameters, mean, and standard deviation. Comparison of data was done in within groups and between groups for NPRS, PPT in Group A and NPRS, PPT in Group B. Difference between the groups were also compared and analysed. T test was used for analysis of the data.

Pre NPRS, Post NPRS, Pre PPT and Post PPT



Graph 1: Group A NPRS and PPT differences were analysed to interpret the results.



Pre NPRS, Post NPRS, Pre PPT and Post PPT

Graph 2: Group B NPRS and PPT data differences were also analysed to interpret the results.

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Between the groups analysis also was done to analyse the effect of the interventions.



Graph 3: Between group analysis of PPT

DISCUSSION:

This study was mainly focused to compare the efficacy of myofascial release technique and cryotherapy technique for delayed onset of muscle soreness. Both the groups were analysed to find the efficacy and impact of both the interventions. One is myofascial release technique and other is the conventional cryotherapy technique.

The commonest area of the muscle which is prone to get more soreness during the eccentric activity of the leg quadriceps was chosen for the study. In sports population and people who do sudden physical activity with various degree of training will generally face the issue of muscle soreness. Due to muscle soreness, the physical activity participation and performance of the activity also would be reduced. The major aim of the study is to restore the muscle activity for the better maintenance and regularity of the performance.

Many researches are available on the systematic and meta-analysis of the intervention for delayed onset of muscle soreness. Erich et.al.in the study of his meta-analysis on the impact of cryotherapy in post exercise recovery, results suggested there is a significant impact of the use of cryotherapy intervention in reducing soreness symptom. ⁽⁹⁾ JamesG.Synder et.al.also suggested in his study the cryotherapy has many various benefits. ⁽¹⁰⁾Kazme et.al. has compared the efficacy of cryotherapy with the electrotherapeutic modality transcutaneous electrical stimulation effect. The results suggested cryotherapy was more effective than TENS application. ⁽¹¹⁾

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Cheatham et.al.has compared the self myofascial release technique with the use of foam roll method to improve the joint range of motion in DOMS condition to know the recovery impact. The researcher suggested as the self MFR is still emerging technique, suggested self MFR may be effective intervention for improving range of motion. ⁽¹²⁾Gulliame et.al. research was also suggesting that the self myofascial release technique has shown the 50% reduction in the pain. ⁽¹³⁾

There are many types of cryotherapy applications, stretching techniques, interventions were followed for treatment of DOMS. Many research articles are focused on self myofascial release technique, cryotherapy individual application methods and evaluation of its efficacy. This current study mainly focused on the application of cryotherapy technique and myofascial release technique to reduce the impact of muscle soreness. (14)

CONCLUSION:

Both the interventions are effective for reducing the impact of muscle soreness post eccentric activity. There is minor difference in the follow up result evaluation, myofascial release group subjects has shown the better symptomatic relief and range of motion compared to cryotherapy group of subjects. The further research has to be done for understanding the strong efficacy of intervention impact on DOMS.

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