Volume : 5 | Issue : 3 | March 2016 • ISSN No 2277 - 8179 | IF : 3.508 | IC Value : 69.48

Research Paper

Study of the Comparison Between Inferior Tibiofibular Joint Mobilization and Myofascial Release Technique on Balance in Chronic Ankle Instability

Medical Science

KEYWORDS : Inferior Tibiofibular Joint mobilization; Myosfascial Release Technique; Chornic Ankle Instability;

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ABSTRACT

Chronic ankle instability is a condition characterized by recurring "giving way" of the outer (lateral) side of the ankle. This condition often develops after repeated ankle sprains. Usually the "giving way" occurs while walking or doing other activities, but it can also happen when you're just standing. Many athletes, as well as others, suffer from chronic ankle instability. People with chronic ankle instability often complain of: A repeated turning of the ankle, especially on uneven surfaces or when participating in sports, Persistent (chronic) discomfort and swelling, Pain or tenderness.[1]

INTRODUCTION

Chronic ankle instability usually develops following an ankle sprain that has not adequately healed or was not rehabilitated completely. When you sprain your ankle, the connective tissues (ligaments) are stretched or torn. The ability to balance is often affected. Proper rehabilitation is needed to strengthen the muscles around the ankle and "retrain" the tissues within the ankle that affect balance. Repeated ankle sprains often cause—and perpetuate—chronic ankle instability. Having an ankle that gives way increases your chances of spraining your ankle repeatedly .Each subsequent sprain leads to further weakening (or stretching) of the ligaments—resulting in greater instability and the likelihood of developing additional problems in the ankle.[1]

BACKGROUND

It is an experimental study which compared the effect of mobilizing inferior tibiofibular joint and myo-facial release technique of tibialis anterior and peroneus longus muscles in chronic ankle instability.

MATERIAL METHODS

CHRONIC ANKLE INSTABILITY (CAI)

CAI has been defined as the tendency of the ankle to "give way 'during normal activity and can occur in the absence of mechanical instability. Explanation for this tendency is that damage to the peripheral mechanoreceptors that provide proprioceptive input results in altered efferent modulation.

STAR EXCURSION BALANCE TEST (SEBT)

The Star Excursion Balance Tests (SEBTs) may offer a simple, reliable, low-cost alternative to more sophisticated instrumented methods that are currently available. The SEBTs are tests of dynamic stability that may provide a more accurate assessment of lower extremity function than tests involving only quiet standing

MYOFASCIAL RELEASE

Myo-fascial therapy can be defined as the facilitation of mechanical, neural and psycho physiological adaptive potential as interfaced via the myo-fascial system. This inclusive definition attempts to acknowledge the wide variety of techniques currently taught under the myo-facial procedure very significantly, running from prolonged stretching and soft tissue mobilization to subtle indirect techniques.

MOBILIZATION

Passive movement of a joint to restore motion or relieve pain. Small oscillatory motions that do not stretch the capsular or other soft tissue structures are often used for reducing pain, while larger oscillatory or sustained motions are used to stretch structures and restore accessory or joint play motions. Movements are slow enough that the patient can voluntarily stop them. (Dorland's Medical Dictionary).

INCLUSION CRITERIA

1. Previous history of unilateral ankle sprain but not occurred within past 6 week.
2. Previous ankle sprains the in contra lateral ankle.
3. Male and female subject's age group from 15 to 35 years of age.

EXCLUSION CRITERIA

1. If they had suffered a fracture to either lower extremity.
2. Previous ankle sprain the in contra lateral ankle.
3. If they have had ankle surgery.
4. Acute ankle sprain within the past 6 week.
5. Any Neuromuscular problem.

DISCUSSION

Students of Glocal University are regarded as the population. Subjects were selected on the basis of inclusion and exclusion criteria and SEBT. Within the group and between the group session comparisons elicited differences for paired T test, unpaired T test elicited non significant differences except for Dorsiflexion between the two groups.

After 5 session of mobilization protocol a significant improvement was found in the dorsiflexion range of motion between groups. The gain in range of motion by manual therapy parallels finding by **Green et al. (2001)**[22] found dorsiflexion improved by 5 to 6 degrees between the treatment sessions. This is also supported **by Hertel J (1999)**[23] who hypothesized that mechanical ankle instability is one of the causes of chronic ankle instability. According to **Denegar et al.(2002)**[23] abnormal ankle mechanics can be in the form of hypo mobility .According **to Hubbard et al.(2005)**[24]mechanical ankle instability research is the little consideration given to the role of positional faults at the ankle complex in the etiology of chronic ankle instability. Anterior fibular position is maintained by changes in peroneal muscle tone mediated through the gamma motor neuron system. The altered afferent input from musculotendinous and ligamentous mechanoreceptors may contribute to maintenance of the anterior position of the fibula. For distal fibula positioned anteriorly, manual therapy technique, mobilization of fibula need to be considered. Selection of mobilizing inferior tibiofibular joint is also based on the opinion of **Kavanagh (1999)**[25], who hypothesized that a positional fault occurs at the inferior tibiofibular joint in ankle sprain patient**.**

Application of mobilization in subjects with chronic ankle instability produced a significant and immediate improvement in dorsiflexion and plantar flexion range of motion but had no significant effect on myo facial activity of tibialis anterior and peroneus longus. **Mulligan (1993)**[26]suggested that individuals with Chronic Ankle Instability may have an anteriorly and inferiorly displaced the distal fibula .If the lateral malleolus is indeed stuck in this displaced position, the anterior talo fibular liga-

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ment may be more slack in its resting position. Thus when the rear foot begins to supinate, the talus can go through a greater range of motion before the anterior talo fibular ligament become taut. This positional fault of the fibula may result in episodes of recurrent instability, leading to repetitive ankle sprains

During ankle dorsi flexion (physiological motion), the talus glide posterior (accessory motion) and externally rotate in relation to the mortoise. Calcaneal eversion also causes the talus to tilt laterally. These motions of the talus in relation to the mortoise produce a superior –posterior glide and lateral displacement of the distal fibula in realation to the tibia. At the same time, at the proximal tibiofibular joint the fibula glides anteriorly and superiorly on the tibia, fixing the fibula.

Despite the increase in range of motion achieved by mobilization, it did not produce a significant change in MFR activity**. Gerrard and Matyas (1980)**[27] were unable to demonstrate any changes in muscle activity with gentle mobilization technique performed in the resistance free part of the range. This seems to indicate that to affect muscle reflex via joint afferents the mobilization technique must be performed into resistance.

According to **Cobb et al.(1975)**[28] to achieve the desired effect on muscle the mobilization must be performed into resistance without excessive pain as this would lead to an adverse effect on the segmental muscle. This can be demonstrated clinically when a mobilization performed too strongly results in pro-active muscle spasm.

RESULT:

Paired t-test was used to compare Dorsi flexion, Plantar flexion and VAS between Pre for 1st day and Post for 5th day with in the same groups. Un Paired t-test was used to compare Dorsi flexion, plantar flexion and VAS between the two groups for differences. The significance level (P) has been selected as a 0.05.

TABLE 1-1: Comparisons of Mean and Standard Deviations of Variables within the Same Group A

PAIR	t-Value	P Value
VAS 0 Vs VAS5	12.475	<0.05
PF 0 Vs PF 5	-5.850	<0.05
DF 0 Vs DF 5	-5.120	<0.05

GRAPH1.1- Shows comparisons of means for VAS, DF and PF with in group A

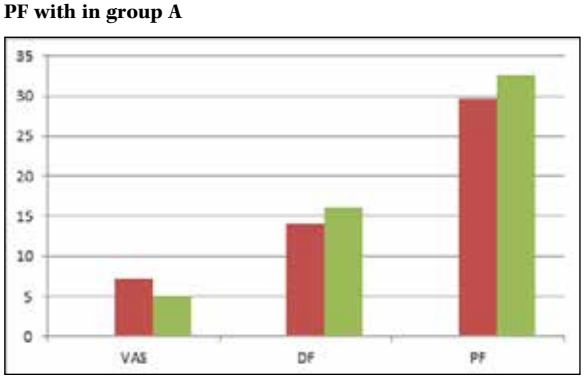


TABLE 1-2: Comparisons of Mean and Standard Deviations of Variables within the Same Group B

PAIR	t-Value	P Value
VAS0 Vs VAS5	9.057	<0.05
PF 0 Vs PF 5	-5.488	<0.05
DF 0 Vs DF 5	-5.033	<0.05

GRAPH1.2- Shows comparisons of means for VAS, DF and PF with in group B

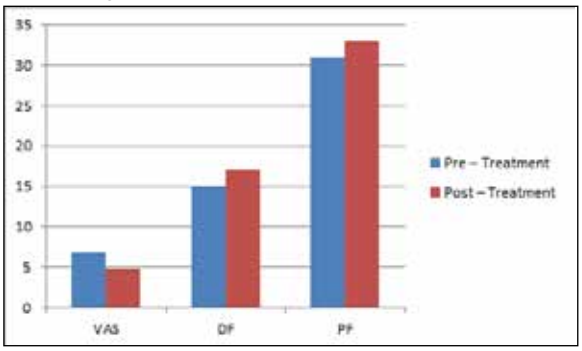
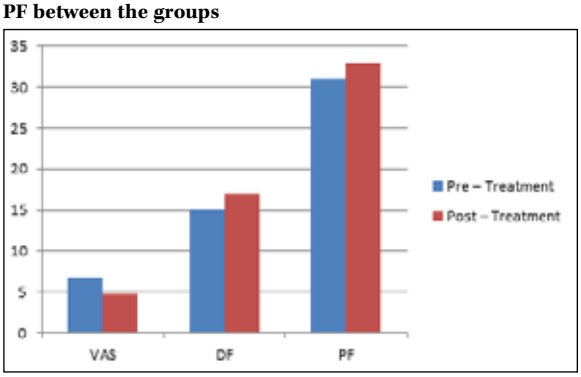


TABLE 1-3: Comparisons of Mean and Standard Deviations of Variables between the Groups

Group A vs Group B	T –value	P-Value
VAS Vs VAS	0.223	>0.05
PF Vs PF	-0.496	>0.05
DF Vs DF	-2.143	<0.05

GRAPH1.3- Shows comparisons of means for VAS, DF and PF between the groups



CONCLUSION

From the study it can be concluded that mobilization and Myofascial release technique both produce effective changes in range of motion and pain in Chronic Ankle Instability, no one technique is more effective than other when compared for efficacy. Furthermore mobilization has more direct role in improving joint ranges.

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