

EFFICACY OF SOFT TISSUE MOBILIZATION WITH MEDIAL TAPING ON KNEE PAIN AND FUNCTION ON EXCESSIVE LATERAL PRESSURE SYNDROME (ELPS) IN COLLEGE STUDENTS

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ABSTRACT

Anterior Knee pain (AKP) is one of the common complaints among active individuals. AKP often results with tightness in the lateral patellar retinaculum which tends to rise of pressure in the lateral surface of patella which is termed as excessive lateral pressure syndrome (ELPS). The common management for the AKP is not effective in ELPS. Therefore, a separate form of management should be incorporated in ELPS. The aim of the study is to identify the efficacy of the Soft tissue mobilization with medial taping on pain and function in ELPS in college students. 58 students who are studying in selected colleges, with diagnosis of specifically ELPS were involved in the study using random sampling method. All the students were divided into equal groups. Group A with Soft tissue mobilization and medial taping was given and Group B with medial taping only. Study was conducted for 6 weeks. Pain was assessed by Numerical pain rating scale (NPR) and functional disability was assessed using Kujala patellofemoral scoring. Data were collected before and after the study were analysed using SPSS. The result of the study shows that there was a significant difference shown in both the groups. Study concludes that application of Medial Taping with the Soft tissue mobilization produce a better result in pain reduction and improvement of the function when compared to the Medial Taping only.

KEY WORDS: Soft tissue Mobilization, Medial Taping, Excessive Lateral Pressure Syndrome. Kujala Scale for Functional Disability.

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INTRODUCTION

Excessive lateral pressure syndrome (ELPS) is one of the common causes for anterior knee pain. It is the abnormal lateral tilt of the patella without lateral translation [1]. It affects adolescent and adults. It is usually characterized by pain in the knee without any injury and aggravated by physical activity [2].

There are multiple causes for the ELPS, which includes imbalance between the stabilizers of

the knee, tight lateral retinaculum, tight vastus lateralis and weakness of vastus medialis [3]. Repeated activity in the knee with abnormal position of patella cause the lateral patellar facet to move over the lateral femoral trochlea which result in chondral damage and osteoarthritis [4]. Excessive lateral tilt of the patella may lead to subluxation or dislocation in the later stages.

Knee bending would enhance the posterolateral

compression forces that are exerted on the lateral aspect of the patella [5]. This is the usual findings of most of the patients with anterior knee pain who don't tolerate prolonged knee flexion. During knee flexion, the contact pressure of the knee increase on the lateral patellar facet [6].

Alignment of the leg or the lower limb eventually results in poor tracking of the patella. Abnormal tracking creates pressure on the outer part of the patella. Stretch over the retinacular structures on the inner part of the patella. Overstretched retinaculum in the inner part could cause shortening on the outer part of the knee with the time [7].

Symptoms usually included pain with prolonged knee flexion, pain on climbing stairs, and pain on compression of patella [8]. EPLS subjects often reports constant anterior knee pain with localized pain in the inferomedial patella and anteromedial joint line with tenderness over the inferomedial patella and on the anteromedial patella. Usually pain aggravates when the knee is moved above 45° of flexion

Quadriceps muscle weakness is one of the reasons behind the malalignment of the patella. Reduction of the quadriceps peak torque has been identified in many patients with maltracking of patella [9]. Many authors have identified that weakness of Vastus medialis obliques (VMO) result in mal tracking of patella, other than that over activity of Vastus lateralis (VL). It was found that the imbalances of VMO & VL are the major cause of maltracking of patella [10, 11].

Common managements include pain medication, knee brace and regular physiotherapy, Arthroscopic lateral retinacular release is also encouraged but the success of the surgery is not much validated [12].

Physiotherapy measures include specific exercises like encourage vastus medialis obliques (VMO) activity, general quadriceps exercise and stretching of lateral structures [13].

There was little information about the application of taping over the patella for the anterior knee pain. Although there are many literatures support the application of taping which play a role in improving the muscle function, decrease

pain and improve the function [14]. The effect of taping was well detailed that it supports joint function by exerting an effect on muscle function, enhancing lymphatic system activity and endogenous analgesic mechanism as well as improve microcirculations [15].

Adhesions develop due to soft tissue trauma or stress can influence tissue mobility, alters neurodynamics and restricts the joint movements [16]. Soft tissue stretch or mobilisation is to rehydrate the connective tissue and to stimulate the production of ground substances thereby assists in orienting the collagen fibres which plays a major role in breakdown of adhesion [17].

Although there are various treatment perspectives in the management of ELPS the evidences are not conclusive. Many studies have demonstrated the role of taping separately and the role of Soft tissue mobilization separately, but the combination of the two treatments was not addressed. So the aim of this study was to compare the efficiency of Soft tissue mobilization with medial taping on pain and function in ELPS in collegiate students.

MATERIALS AND METHODS

Experimental study was performed with 58 subjects, after obtaining the authorization letter from ethical committee. Initially the study was started with 62 subjects with ELPS, who were critically diagnosed by two orthopaedic surgeons and clinical relevance of the symptoms were included in this study. A detailed screening was done for all the participants by the researchers. Written consent was obtained from every individual participant. They participants were randomly divided into two groups. A sealed cover was given to the office secretary who is not involved in the research and she gave the cover randomly to the participants who are visiting the front office, the cover with A was enrolled in the experimental group and the cover with B was enrolled in the control group.

Participants with the age group of 25—45 years, both gender, symptoms of anterior knee pain for more than two months. Pain in the anterior knee after prolonged sitting, climbing stairs and hopping, and those with positive Clark sign were involved in the study. Patients with other knee

problems, sensory problem, recent surgeries and recent knee injuries were not selected for the study. The participants in both groups were given 6 weeks of treatment, 3 times a week. In experimental group participants underwent Soft tissue mobilization with Medial Taping. Soft tissue mobilization was applied for 15 minutes, Technique includes fascial release for the lateral retinacular structures, IT band as well as the vastus lateralis muscle group, this was followed by Medial Taping was applied over the anterior patella. In addition to that 10 minutes of Vastus Medialis strengthening was done for every patient. In the Control group participants receive Medial taping applied over the anterior patella with 10 minutes of Vastus Medialis strengthening exercises. Home exercises also advised for the patient with same exercises.

Data were collected through visual analog scale for pain and Kujala patellofemoral scoring system for functional ability. All the data were collected by the Blinded assessor who is not in the study. The blinded assessor will do the analysis at the beginning of the study and at the end of the study. SPSS was used to analyse the data which are collected before and after the study.

RESULTS

Table 1: Showing the various variables in experimental and control groups.

Variable	Experimental	Control
Age	34.226 ± 5.44	35.192 ± 5.87
Male	33.429 ± 5.68	34.883 ± 6.48
Female	34.882 ± 5.31	35.50 ± 5.52
Duration of symptoms	2.3793 ± 0.494	2.4828 ± 0.574
Pain intensity	6.2069 ± 0.940	6.3793 ± 0.903
Kujala	59.655 ± 8.53	61.586 ± 6.80

A total of 58 subjects were participated in the entire study out of 62 participants who enrolled initially, 4 subjects dropped (2 in each group) from the study because of increased symptoms, transfer of the work place, change of address and hospitalization following severe cardiac problem. The study completed with 58 subjects and the result were analysed for the 58 subjects only. Each group has 29 subjects. The variables of age, gender and duration of symptoms were analysed, shown in table 1.

The age group of participants in experimental group was 34 years and in control was 35 years.

Both genders were included in the study, male with average age of 33 years and female with 34 years in experimental group and in control group male averages 34.8 years and female 35.5 yrs. The symptom duration was not significantly differed. Both groups have symptoms of duration as 2 weeks.

The total of pain intensity for the experimental group was 6.2069±0.940 and the control group was 6.3793±0.903 and the kujala scale for disability in experimental group was 59.655±8.53 and the control group was 61.586±6.80

Table 2: shows the value of the Pain scale and Kujala patellofemoral scoring system.

Variables	Experimental Group			Control Group			Unpaired 't' test
	Mean	S.D	Paired 't' value	Mean	S.D	Paired 't' value	
Visual Analog Scale	5.07	1.19	22.9 (P <0.000%)	2.1	1.45	7.82 (P <0.000%)	10.33± 1.16 (P <0.0001)
Kujala patellofemoral scoring system	30.9	10.4	16 (P <0.000%)	18.2	12.3	8 (P <0.000%)	6.81± 6.00 (P <0.0001)

Table II shows the value of the Pain scale with the value of 22.9 ±1.19 in the experimental group and the control group has 7.82±1.45. The paired t value for the pain scale was 7.82 and 22.9 which were greater than the table value. This shows the study rejects null hypothesis, and it also state that there was significant improvement between the pre-test and post-test values in both the groups. The unpaired t value is 10.33 ±1.16 which was also greater than the table value. This shows that there were significant differences between the experimental and control group subjects. So, this study rejects null hypothesis.

Table II shows the value of the Kujala scale with the value of 16.0 ±10.4 in the experimental group and the control group has 8.00±12.3. The paired t values for the experimental group were 16.0 and the control group was 8.00 which were greater than the table value. This shows the study rejects null hypothesis, and it also state that there was significant improvement between the pre-test and post-test values in both the groups. The unpaired t value is 6.81 ±6.00 which was also greater than the table value. This shows that there were significant differences between the experimental and control group subjects. So, this study rejects null hypothesis.

DISCUSSION

The result of the study showed that 6 weeks

using Soft tissue mobilization and medial taping with only Medial taping improved all the variables include pain and function. The result of the study shows that Soft tissue mobilization with Medial Taping has significant improvement when compared to Medial Taping alone. Soft tissue mobilisation applies specific and progressive manual forces that promotes changes in the Myofascial structures which elongate the shorten fascia [18]. It also balances the fascial structures around the knee joint and it balance the tensile loads around the knee, it also reduce the biomechanical abnormality which are associated with the patellofemoral pain syndrome [19].

Soft tissue mobilisation helps to rehydrate the connective tissue and stimulate the ground substances which aids in breakdown of the micro adhesions [17] as well as it orients the collagen fibres [16,20]. It also recued the stress on the pain sensitive structures and improves the knee function [21]. Researchers shows that soft tissue mobilisation over the fibrous joint capsule and over the patella tendon improve the extensibility of the tendons and capsule and aids in improvement of the elasticity of the soft tissue structures [22].

Taping supports the joint by exerting the muscle function, enhance the lymphatic system activity and endogenous analgesic mechanisms as well as improve microcirculation [12]. Application of the tape helps to provide proper positional stimulus to the patella [23] and it improves the patellar orientation within the trochlear groove, thus improving the patellar tracking [24].

Some authors have identified that the pain reduction following application of the patellar tape is associated with reduction of the force in patella [25]. The Patellofemoral joint reaction force (PFJRF) has shown consequent reduction following patella taping [26]. Certain authors have also stated that due to reduction of the loading to the knee by tape application reduces the sensitive innervated peripatellar tissues rather than permanently changing any malalignment [27]. The inflamed tissues have not healed by tape application but it restores the homeostasis due to sufficient length of time on load reduction [28].

General strengthening exercises to the muscles around the knee help in reduction of force in the patellofemoral joint [29]. VMO strengthening is one of the cornerstones for the tracking problem of knee. However, the evidences are less identified; VMO plays a major role in reduction of maltracking and pain in the knee [30].

Many authors have supported that the taping and exercises has shown improvement in PFPS. This study has shown significant improvement in the group with Soft tissue mobilization, taping and exercises when compared with the other group of taping and exercises. Addition of Soft tissue mobilization has shown that there is a significant reduction of the pain and improvement of the function.

There are limitations were found that the study measures the outcome with 6 weeks of treatment. The long-term outcome was not measured. This study does not consider any biomechanical dysfunction causing excessive lateral pressure syndrome (ELPS). Further research can be recommended to apply taping along with soft tissue mobilization in athletes with patellar tracking dysfunction for sports specific rehabilitation.

CONCLUSION

The taping with combination of exercises and Soft tissue mobilization has found to be very effective and significant difference was found in function and pain scale. Hence the results provide important information for the clinical practice in treating patients with Patello femoral dysfunctions.

Conflicts of interest: None

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