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Research Paper

A Study on Efficacy of an Ultrasonic Therapy and Knee Strengthening Exercise Programme for Osgood Schlatter Disease among Young Athletes

Rehabilitation

KEYWORDS : Osgood Schlatter disease, ultrasonic therapy, knee strengthening exercises, athletes

S. Senthilkumar — ICSSR FELLOW, PhD Research scholar, Holy Cross College, Tepakulam (Po), Trichirappalli – 620002, Tamilnadu, India.

Dr. P. Swarnakumari — Associate professor and research supervisor, Department of Rehabilitation science , Dept., of Rehabilitation science, Holy Cross College, Trichirappalli – 620002, Tamilnadu, India.

ABSTRACT

Osgood-Schlatter disease is easily recognized in the adolescent with complaints of pain which is Localized to the area of the tibial tubercle. Discomfort is usually generated with running, kneeling, ascending or descending stairs. In this work is presented the experience with Osgood Schlatters disease in young male athletes. From one overall number of 20 young male athletes with ages between 9 to 16 years is found that 20 or 8.9% had Osgood Schlatters disease. In control group of 20 young males (10-16 years) with sport activities is found 4 % of Osgood Schlatters disease. In experimental group of 20 were treated with ultrasonic therapy and knee strengthening exercises. The data obtained was tabulated and statistically analyzed using SPSS 14.0 package. Due to nature of outcome measures i.e. pain, parametric statistical tests, dependent t sample test and un paired t test were used. The two-tailed P value equals 0.0015 by conventional criteria; this difference is considered to be very statistically significant. This study was to prove the effective treatment of ultrasonic therapy and knee strengthening exercises programme in Osgood schlatters disease.

INTRODUCTION:

Osgoodschlatters disease is one of the most common sports limiting orthopeadic conditions that adolescent athletes between the ages of 9 and 14 years. It is more common in males than in females. Clinically, it is characterized by well localized pain to the patellar tubercle. The growth plate of the tibial tuberosity is unique, in that it is composed primarily of fibrocartilage and fibrous tissue. As the apophysis matures, ossification changes from membranous to enchondral. During the enchondral phase, the physis is less resistant to tensile stress, and failure may be manifested by fragmentation of bone at this site. Osgood-Schlatter disease is characterized by pain with kneeling and/or pain with activity involving quadriceps contraction. The tibial tubercle or tibial tuberosity is a bony prominence just below the knee at the front. It is the point where the quadriceps muscle tendon inserts into the upper tibia, and takes all the force of the knee muscle's activity. When standing up, go up stairs or run, all the force of our major knee power muscle is transmitted through the tibial tubercle. In adults this bony lump is firmly fixed to the shin bone, but in adolescents there is a growth plate present. Repeated vigorous activity causes traction (pulling) on this growth plate and this is thought to cause inflammation and pain. Usually settles once the growth plates fuse to the shin bone as we stop growing, at about 14 to 18 years of age. Pain is worse doing vigorous activities such as running and jumping, and better with rest or doing less stressful activities. An ultrasonic therapy a to relieve pain in the tibial tubercle and the strengthening exercises of knee to improve the quadriceps muscle activity.

OBJECTIVE OF THE STUDY

To prove the effectiveness of ultrasonic therapy and knee strengthening exercise programe can be relieve pain and improve quadriceps strength in athletes.

METHODOLOGY:

A convenience sample of subjects was solicited from Athletes in Anna stadium, Trichirappalli Tamilnadu, India.. Inclusion criteria included any person (9- 15 years), complaining of knee pain in unilateral or bilateral for the last three months., Subject to males All subject were screened as in acute and sub acute stage, Patient with painful knee and decreased range of motion Muscle spasm and inflammation of the tibial tubercle. Exclusion criteria included medically unstable patients, tumors, hyper mobility, septic arthritis Patients with inflammatory, condition and deformity of the joint. Non ambulant patients. Patients do not satisfy inclusive criteria.

Materials: Universal Goniometry, Visual analog scale,

PROCEDURE:

Participants were selected from athletes (n=20, age range= 15-21 years, mean age= 2 years, male young athletes and asked to fill questionnaire form about musculoskeletal symptoms and intensity or severity of pain experienced. Subjects were then allocated into two groups,

Group A (Experimental) subjects were treated by ultrasonic therapy and knee strengthening exercises given.

Group B (control) were just asked to take cold packs for 20 minutes with general exercises and advice given.

INTERVENTION:

Ultrasonic therapy:

The drug to be driven in to the tissue is combined in a suitable gel or cream which forms the couplant. It is smeared onto the part using spatula so that it is not applied by the patient fingers. The treatment head used onto the skin in a usual manner. Relatively high intensities of 1 and 1.5 W/cm2 have been used. The depth of the target tissue determines the frequency used. The time of treatment 15 minutes for every 10cm2 areas is reasonable, although some suggest 5 minute for each 25 cm2 totally calculated by 15 minutes. The ultrasonic therapy applied to the tibial tubercle of the knee joint.

Knee strengthening exercises:

Wall slide: Leaning with your back against a wall, bend your knees 30°, sliding down the wall, then straighten up again. Move slowly and smoothly, using your hands on the wall for balance. Keep feet and legs parallel, and do not allow knees to go out over the toes. Repeat 5 -10 times.

Bent-Leg Raises: Sitting in a chair, straighten one leg in the air (without locking the knee). Hold for about one minute. Bend your knee to lower the leg about halfway to the floor. Hold for 30 seconds. Return to starting position. Work up to 4 reps on each leg.

Straight-Leg Raises: Sitting in a chair, rest your foot on another chair. Lift the foot a few inches off the chair while keeping your leg straight. Hold for 5 -10 seconds. Return to resting position. Repeat 5 -10 times. (Also work on increasing the time, up to 2-3 minutes if possible.)

Abductor Raise: Lie on your side, propped on one elbow. The leg on the floor bent, the other straight. Slowly lift the top leg, hold for 5 -10 seconds, then lower. (Ankle weights will increase the

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intensity). Do 1-3 sets with 12-15 repetitions each. Remember to rest in between sets.

Hamstring Curl: Stand with the front of your thighs against a surface (a table or wall). Flex one knee up as far as is comfortable. Hold for 5 - 10 seconds, and then lower slowly. If possible, do not touch the floor between repetitions. (Ankle weights will increase the intensity.) Do 1-3 sets with 12-15 repetitions each. Remember to rest in between sets.

Step-Ups: Stand in front of a step, like a sturdy bench or stairs, about two feet high (or less if necessary). Step up onto the support, straighten your knees fully (without locking them) and step down. Maintain a steady pace. If you are comfortable with your balance, pump your arms while doing this exercise.

RESULTS:

A total of 40 subjects were identified as potential participants for this study and were allocated to the control and experimental groups. Each group was divided into 20 subjects. The data obtained was tabulated and statistically analyzed using SPSS 14.0 package. Due to nature of outcome measures i.e. pain, parametric statistical tests, dependent t sample test and un paired t test were used. Subjects showed marked reduction in pain intensity when compared to baseline value. The improvement is almost where as Pain scores were recorded on day 0 and day 7.

Table.1 Pre intervention of pain for Group A and B

s. no	Statistical measurement	GROUP A	GROUP B
1.	Mean	7.7	7.8
2.	Standard deviation	0.923	0.833
3.	Variance(Standard deviation):	0.852	0.694
4.	Population Standard deviation:	0.9	0.812
5.	Variance(Population Standard deviation):	0.81	0.66

Graf.1 Pre intervention of control and Experimental group

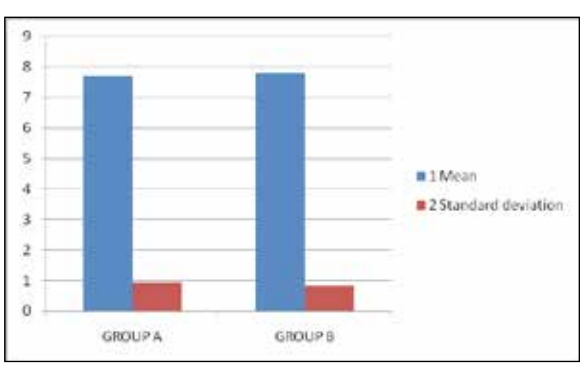

Table 2 Post intervention of pain for Group A and B

s. no	Statistical measurement	GROUP A	GROUP B
1.	Mean	0.85	2.85
2.	Standard deviation	0.489	2.560
3.	Variance(Standard deviation):	0.239	6.555
4.	Population Standard deviation:	0.476	2.495
5.	Variance(Population Standard deviation):	0.227	6.227

Graf.2 post intervention of experimental group A and control group B

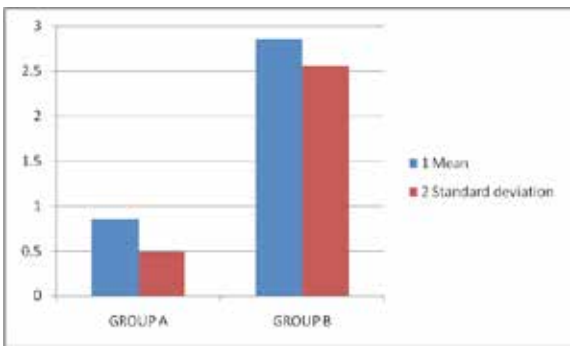

Table 3 Un paired T test

S. NO	VARIABLES	t value	difference	standard error of difference	Results
1.	PAIN	t = 3.4318	df = 38	0.583	SIGNIFICANT

This study was designed to know the efficacy of Ultrasonic therapy with strengthening exercises in the treatment of Osgood–Schlatter disease by comparing with hot packs and home advise alone While analyzing the outcome measurement, both group show significant improvement .Statistical analysis of the data in pre- and post intervention VAS values show that extremely statistical satisfaction in Group A than Group B.

P value and statistical significance: The two-tailed P value equals 0.0015 by conventional criteria; this difference is considered to be very statistically significant. Confidence interval: The mean of Group A minus Group B equals -2.00000. 95% confidence interval of this difference: From -3.17978 to -0.82022

DISCUSSION:

Repeated and hard straining of patellar tendon on attachment on tibia bulge is a cause of mechanical trauma, which causes a change of phatoanatomic shape of tibia bulge that in a certain moment can transform in "inflammable" – non infected faze when pain appears. One of the factors that enhance the appearance of this disease surly is an inadequate practice of young sportsman, which is consisting of greater and frequent practice with intensity that is not justified with biomechanical characteristics of bones-joint system in children and adolescents. Frequency of Osgood–Schlatter disease at young Athletes in our work is 8.9% which is a little bit less from Finland author studies who found that 13.0% of Finland teenagers have a sings of this disease (Visuri et al, 2007) (Visuri, Pihlajamäki, Mattila, & Kiuru, 2007), yet Brazilian authors showed prevalence of this disease in the same age group of Brazilian children from 9.8%. (Gildasio, Gomes dos Santos & Guerra, 2010) However, beside a simple and easy discovery of this disease, at the biggest number of patients it occurs very late, almost in a phase of fragmentation dividing of a tibia bulge when is required a long period of healing. This study suggests that the ultrasonic therapy and knee strengthening exercise programme can be incorporated as a treatment tool for os good schlatters disease.

SUGGESSIONS AND LIMITATIONS:

Negligence of symptoms of this disease with inadequate healing and sooner return to a leg working process, could lead to impossibility of returning to a specific sport practice at all. Reinforced physical effort of children and adolescents are not excluded cause of formation of this disease, which is proven in this work, where we showed that at children and adolescents who are not exposed to reinforced physical effort also comes to appearing of this disease, but in less percentage. Prevention of Osgood–Schlatter disease includes exclusion of activity which leads to it. It is known that chronicle, repeated stress on a tendon of patella and its attachment on a tibia bulge cause this disease. Possible ways of prevention includes, beside else, adequate pe-

riod of worm-up before competition activity or practice, which has for a cause a preparation of muscles and tendons for activity and increase their flexibility and resistance on well programed sports activity adjusted to a biochemical abilities of competitor, strengthening the quadriceps which leads to reducing a stress of patella tendon, and at the end establishment of a balance between the power of the front muscle (m. quadriceps) and rare (mm. hamstrings) group of upper leg is a very important for preventing reinforced stress of patellar tendon. This study can be conducted further in following manners. Increase the time duration of the study. Increase the sample values more settings and long duration of the study, Will help to further improvement of the study.

CONCLUSION:

Sport has an important role in every area of human life. Physical activity influences positively

On a healthy way of life, improvement of a health, and on quality of a life. One of main factors for healthy life is regular physical activity. It is impossible to count all positive aspects of physical activity, but without a doubt, some of them are: improvement of a health and quality of life, long lasting life and less risk for certain diseases, like heart and blood drain diseases, diabetes, malignant diseases, etc.Beside all positive features of sports, regarding, certain sports activity, especially if they are done not respecting the age and gender of sportsman, could lead to appearance of certain diseases. One of them, which can appear because of hard sports activities, is sourly apofizitis of tibia bulge (Osgood–Schlatter). Reinforced sport activities in adolescent period are one of reasons for frequent appearance of apofizitis of tibia bulge, known Osgood–Schlatter disease. Inadequate legwork process by intensity and frequency surly plays a big role in a formation of these diseases. These disease can be controlled and prevented by the physical therapy intervention, thus the study was determined to prove the efficacy of the ultrasonic therapy and quadriceps strengthening exercise programme was reduce the bulge and relief of pain in the tibial tubercle. The young athletes are return to the sports activities.

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