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Treatment Interventions for Medial Tibial Stress Syndrome

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Abstract

Medial Tibial Stress Syndrome (MTSS) or more commonly referred to as “shin splints” is characterized as an overuse or repetitive stress injury that causes vague pain over and around the tibia. Researchers are yet to determine a definitive cause though numerous risk factors have been noted. They are as follows; over training, type of surface, poor footwear, muscular imbalances at the ankle, over tight or weak triceps surae muscles, imbalances at the thoracolumbar complex, other muscular imbalances and BMI above 30. Rehabilitation and treatment interventions often call for a pause in training entirely or at the very least an immediate scaling back of running or training. Most other interventions call for either a change in running or playing surfaces and a change or upgrade in footwear. For athletes competing at high levels, ceasing or lessening the workload can be detrimental to their seasons. Treatment interventions that call for rehabilitation plans that address the muscular imbalances are better suited for the competitive athlete. With this paper we intend to look at the rehabilitation plans for MTSS that address as many of the risk factors as possible. Once an ideal rehabilitation plan is drafted it would then be put it in to a preventative exercise plan that would hopefully minimize the risk of athletes and active people getting MTSS.

Background

Medial Tibial Stress Syndrome (MTSS) or more commonly referred to as “shin splints” is characterized as an overuse or repetitive stress injury that causes vague pain over and around the tibia. MTSS is one of the most common injuries that affects runners of all levels of experiences. This injury is most likely to occur in new runners who start off by jumping in to high volumes of running rather than properly pacing themselves and gradually increasing running distance. It can also often times be attributed to improper footwear due to lack of education or access to the proper footwear. But although it is most prevalent in new runners it is something that often affects experienced runners that have proper footwear and have proper conditioning. These cause for these athletes are much more complex and have not necessarily been pinpointed. Most researchers attribute the development of MTSS in these experiences runners to muscular imbalances all along the kinetic chain. The purpose of this study is to look at rehabilitation techniques that are commonly used to treat MTSS and look at how they could be used as a preventative technique.

Methods

We looked at around twenty peer reviewed articles that addressed the causes, treatment and potential preventative interventions that could be done in relation to MTSS. Most of these studies were cohort studies and were mostly small scale. Very little research has been done on preventative measures.

Hypothesis

Rehabilitation techniques can be used as preventative interventions in order to lessen the chances of MTSS forming in runners.




RUNNING PHYSIO 

Exercise programme for MTSS **Please note this is an example programme **not** a recipe!**


1. Step ups
Step up using the foot on the step not pushing up from the foot on the floor. Aim for 3 sets of 10-12 reps on each leg.



2. Soleus squat
On both legs. Slide down the wall so your knees are flexed to around 80°. Push up on your toes. Hold for 20-30 seconds. Repeat 4-6 times.



3. Bent leg calf raises
Similar to the straight leg calf raise but with the knee flexed about 30°. 3 sets of 12 reps, slow and controlled. Add weight as able.



4. Single leg soleus bridge
Place your forefoot on the edge of a step. Use your arms for support and lift your bottom off the floor using one leg. 3 sets of 8-12 reps on each leg.




5. Hip hitches
Stand on the edge of a step. Keep your leg straight and hitch your pelvis up then slowly lower. 3 sets of 8-12 reps on each leg. Add weight as able, in the opposite hand.



6. Calf raises
3 sets of 15 reps (one each leg) on the edge of a small step, holding a 4kg weight. Keep it slow and controlled. Increase weight as able.



7. Side lying leg lift
Lie on one side and lift the upper leg up, keeping the knee straight. Do 3 sets of 12-15 reps on each leg (until the glutes feel tired).



Results

After reviewing the literature it can be concluded that there are three main causes of MTSS. They are; improper footwear/ running surfaces, overtraining and a plethora of biomechanical factors. The biomechanical factors that are thought to cause shin splints are numerous and as follows; navicular drop, tightness/ weakness of the triceps surae, arch weakness, external hip rotation, weak glutes, ankle instability, weak core musculature, poor balance and over pronation and supination. Most rehab plans addressed some of these biomechanical imbalances but not all of them. The primary treatments that were used was immediately ceasing exercise or lessening running load, ice and some stretching of the gastrocnemius. Only one study could be found that had utilized preventative exercise in MTSS. This study found no correlation but the exercises were performed at home with no verification that they were actually performed or performed properly. Many articles touched upon the possibility of preventative exercise but many of them only initiated those exercises after the fact.

Conclusion

As we did not conduct any research of our own we can not speak to how our research may have compared to others. However after looking at over twenty different articles there can be some conclusions drawn. All of the articles that were read cited the three main causes of MTSS mentioned above; overtraining, poor running surface/ shoes, and numerous biomechanical factors. The primary difference between the articles and research studies were the specific biomechanical factors that cause MTSS. More studies addressing specific biomechanical factors must be conducted in order to narrow down the causes. Once this is done a more specific preventative exercise plan can be initiated. Until those factors can be confirmed a study should be conducted doing a general preventative exercise plan.

References-

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