Overuse Lower Extremity Injuries in Sports

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KEYWORDS

• Medial tibial stress syndrome • Achilles tendonopathy • Iliotibial band syndrome
• Stress fractures • Eccentric strengthening • Core strength

KEY POINTS

- Medial tibial stress syndrome is a common overuse injury, particularly in new runners. Diagnostically one must differentiate between a stress fracture and soft tissue injury. Treatment may include a relative rest period, and athletes are encouraged to participate in cross-training. Strengthening and sport-specific training are imperative before return to activity.
- ITBS is most common in distance runners and cyclists. Stretching plays a part in the treatment but it has been proved that strengthening of the core muscles, in particular the hip abductors, is the most important aspect of treatment.
- Stress fractures typically present with an insidious onset and pain increasing as the activity progresses. Radiograph should only be considered an initial screening tool and a negative result is not conclusive as far as a fracture is concerned. MRI, CT scan, and bone scintography should all be used to make a proper diagnosis.
- A sports medicine professional has an obligation to make a diagnosis and treat the cause of the injury to safely return the athlete to their respective sport.

INTRODUCTION

Physical fitness has become an important lifestyle choice for a portion of the population. When athletes train harder, the risk of injury increases. This article explores several common overuse injuries to the lower extremity including medial tibial stress syndrome (MTSS), iliotibial band syndrome (ITBS), and stress fractures. Many articles[1–3] have shown that these are among the most commonly diagnosed lower limb injuries caused by overuse. Our charge as sports medicine professionals is to identify and treat the cause of the injuries and not just treat the symptoms. Symptomatology is an excellent guide to healing and often the patient leads the physician to the proper

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diagnosis through an investigation of the athlete's training program, past injury history, dietary habits, choice of footwear, and training surface.

MEDIAL TIBIAL STRESS SYNDROME

MTSS in layman's terms is often referred to as "shin splints." It is a more common complaint for the novice athlete. There are several differential diagnoses that fall under this term but most commonly the athlete is experiencing MTSS. There are often intrinsic and extrinsic factors causing this injury including gastrocnemius-soleus tightness, deep posterior muscle group weakness, tibial varum, improper biomechanics, training on hard surfaces, training errors, and worn-out running shoes.

To date, there is a lack of high-quality level one evidence studies on the subject. In a recent article Hamstra-Wright and coworkers[4] state "There is a need for high-quality, prospective studies using consistent methodology evaluating MTSS risk factors." Newman and colleagues[5] published a meta-analysis of the last 40 years on risk factors for MTSS and found that it affects 5% to 35% of runners and includes a prior history of the injury, increased body mass index, increased navicular drop, and increased external hip rotation in males to all be factors but the causative factors remain inconclusive. Yuksel and colleagues[6] found that some athletes with MTSS have an imbalance of inverters and everters of the foot and ankle. Strengthening these groups of muscles was shown to be helpful. Note that the strengthening exercises to follow in the IT band portion are also applicable for MTSS.

These patients typically exhibit more pain at the start of a run. Although it subsides during the run, the patient then has more pain after stopping. MTSS pain occurs along the lower third of the posterior medial surface of the tibia, which coincides with the origin of the posterior tibial muscle and the soleus muscle.[7] Yates and Bennett found that a pronated foot type was statistically significant for predicting MTSS to occur in naval recruits and high school runners, respectively.[8–10] In chronic cases of MTSS, one notes pain with palpation along a diffuse portion of the medial tibia and palpable scar tissue.

Treating Medial Tibal Stress Syndrome

There are different phases to the treatment of MTSS. The first phase is aimed at reducing pain and inflammation. Relative rest is required during this phase but one can allow cross-training as long as it does not increase any of the symptoms. Biking, swimming, the elliptical trainer, and pool running are all excellent ways to maintain aerobic fitness. One should use physical therapy modalities, deep tissue massage, stretching, ice massage with frozen paper cups, and/or the Alter G treadmill.

Shockwave therapy when compared with a control group was found to allow runners to return to activity in 59 days versus 91 days.[11] Shock-absorbing insoles, strengthening including the core muscles, and a gradual return to training have all proved to be effective at reducing symptoms and faster return to activity.[11–13]

The next phase involves the introduction of strength and proprioception training as tolerated while the patient maintains many of the tasks he or she initiated in phase one. Once the patient is pain-free and can perform isometric and isotonic strengthening exercises with no pain, he or she can then start the final phase, which involves eccentric and plyometric exercises aimed at strengthening the muscles in the way that they are used during running. Jumping on a mini-trampoline and jumping rope are two excellent plyometric type exercises that help to strengthen the posterior muscle groups that become weakened during MTSS.