

Medial tibial stress syndrome in military recruits

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Military basic, or entry level, training has been known to cause very high levels of injury in recruits. In some cases, 60 to 70 percent of trainees have been injured in an eight week period^{1,2}. The majority of these injuries have been overuse injuries of the lower limbs - patellofemoral dysfunction, Achilles tendonitis, stress fractures, plantar fasciitis and shin splints (medial tibial stress syndrome) being the most prominent. Some of these injuries are well defined, clearly understood clinical entities; others, particularly patellofemoral dysfunction and shin splints, are often subject to quite different diagnostic criteria.

Shin splints have been described as 'pain and discomfort in the leg from repetitive running on hard surfaces or forcible, excessive use of foot flexors; diagnosis should be limited to musculo-tendonous inflammations, excluding fractures or ischaemic disorders'³.

The confusion that surrounds just what does constitute shin splints is reflected in the multitude of alternative names for the condition: posterior tibial tendonitis, anterior (or medial) shin splints, soleus syndrome, tibial periostitis. It has often been equated, usually in lay athletic journals, with tibial and fibular stress fractures. A more precise definition is provided by Slocum⁴: 'a sterile mechanical inflammation of the muscle-tendon unit brought about by over exertion of the muscles of the lower part of the leg during weight bearing'. It is a descriptive, rather than diagnostic, term. It also appears that 'medial tibial stress syndrome' is becoming established as the appropriate term to use when considering shin splints, and will educe the ambiguity that has abounded.

The only prospective study on shin splints was undertaken on a US Naval Academy cohort of 2,777⁵. Out of this group, 97 suffered shin splints during training, a rate of 3.5 percent. On average, each patient had to stop running for 8 to 10 days. No prophylactic regimen was found to result in a significant reduction in incidence of shin splints. It was concluded that the major contributor to the causation of shin splints was over exertion without proper conditioning.

A retrospective study conducted on recruits at the RAAF Recruit Training Unit, Edinburgh⁶, demonstrated that shin splints were

not a major cause of significant injury, where the definition of significance was the loss of sufficient time from the course (usually greater than 5 days) to result in backcoursing of the recruit. Only 16 out of 8,644 recruits required physiotherapy and other treatment modalities for shin splints. It was generally possible to continue to function with the injury, but a large amount of morbidity was inflicted on the recruits.

Not all the studies looking at injury rates in military recruits identified shin splints as a separate entity. This further demonstrates the ambivalent attitude towards the syndrome.

Medial tibial stress syndrome has been found to have a distinctive scintigraphic appearance⁷, with a 'diffuse linear uptake of technetium 99 in the delayed static phase' along the medial border of the tibia. Roentgenograms are invariably normal, as are, by definition, compartment pressures.

Clinical features are predominantly of pain over the medial tibia, more pronounced over the distal half, occurring on weight loading of the leg, and resolving on rest. There may be some swelling associated with the pain, and irregularity of the tibia may be noted.

The course of the disease is almost always self-limiting. Treatment should involve relative rest, ice packs, and NSAID's. Injections of the medial tibial border with corticosteroids have met with limited success⁸.

Preventive methods can be divided into extrinsic and intrinsic, extrinsic being those factors associated with the training programme, and intrinsic those factors associated with the individual. The best defined risk factors for lower limb overuse injuries in general, and stress fractures in particular (there have been essentially no studies specifically dealing with the prevention of shin splints) are those intrinsic factors of female sex, high Body Mass Index, poor pre-training level of physical fitness, the presence of a lower limb deformity and a history of lower limb injury.

Extrinsic factors are also thought to have a major impact on injury, but have not been exclusively demonstrated in studies to date. They are inappropriate footwear, drilling on hard surfaces, inadequate warmups, a too rapid in-

crease in exercise demand, exercising in cold weather and a heavy work load in the third week of training when the bone is at its weakest. This last cause is because of bone remodelling in response to repeated microtrauma⁹.

Specific causes of shin splints are generally very similar to other lower limb over use injuries. Training techniques must be addressed, with care to not be overly ambitious in the build up of training, and the improvement of leg musculature through exercises and stretching. Orthotics also have their role, and should be considered in patients before a return to a training programme.

Shin splints are thus a specific clinical entity, which generally respond to simple therapeutic measures. Shin splints are, however, painful, and may indicate that other overuse injuries could develop and that aspects of the individual and/or the training need to be reviewed. All cases of shin splints in basic military training are preventable, if recruits are adequately prepared for the physical demands of the course, and if courses are modified to minimise trauma to the lower limbs, without compromising terminal objectives.

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