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MASSAGE: HYPOTHETICAL MODEL

Massage treatment and medial tibial stress syndrome; A commentary to provoke thought about the way massage therapy is used in the treatment of MTSS

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Summary As students and practitioners we are taught about the treatment and causative factors of medial shin pain, in particular' shin splints' or the more recent term; medial tibial stress syndrome (MTSS). During the years there have been many theories, conjecture and misunderstandings about the mechanisms of 'shin splints/medial tibial stress syndrome' however the ramifications of these mechanisms on how massage treatment is delivered have not being discussed. The evidence for the treatment of MTSS is largely clinical with little evidence of any treatment being proven to be effective in treating MTSS. The aim of this article is to present a summary of the mechanisms of MTSS and a commentary to provoke thought about the way massage therapy is used in the treatment of MTSS based on these mechanisms.

The terminology and background

Medial shin pain has been referred to over the years by many names from 'shin splints', medial tibial stress syndrome (MTSS), medial tibial traction periostitis and the overarching term exercise-related lower leg pain (Beck, 1998; Brukner and Khan, 2007; Kortebein et al., 2000; Krivickas, 1997; Mark Blue and Matthews, 1997; Moen et al., 2009; Mubarak et al., 1982; Sommer and Vallentyne, 1995; Stickley et al., 2009; Whiting and Zernicke, 1998).

The most widespread opinion in the literature is that MTSS is an overuse exercise-induced injury producing an inflammatory soft tissue and deep fascial reaction in the middle and distal thirds of the medial border of the tibia (Bennet et al., 2001; Mubarak et al., 1982; Whiting and Zernicke, 1998; Yates et al., 2003). For many years medial shin pain was referred to as shin splints (Kortebein

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et al., 2000; Krivickas, 1997; Moen et al., 2009; Mubarak et al., 1982; Whiting and Zernicke, 1998). The terms MTSS, stress fracture and compartment syndrome have replaced shin splints' (Moen et al., 2009; Mubarak et al., 1982). These terms reflect the differences in presentation and anatomy between each cause of lower leg pain.

Stress fractures are fractures of a bone resulting from clinically significant stress reactions causing structural failure (Grimston and Zernicke, 1993; Jones et al., 1989).

Research suggests that MTSS is a distinctly different pathology from compartment syndrome (Stickley et al., 2009) but that that the relationship between stress fractures and MTSS is less clear with many believing that stress fractures and MTSS are on the same continuum (Beck, 1998; Galbraith and Lavallee, 2009).

Issues with the terminology

Despite the change of terminology from shin splints to MTSS, there is still controversy over the term. Bruknar and Khan believe that the term MTSS is somewhat meaningless and they think that medial tibial traction periostitis is preferable as it more accurately reflects the pathophysiology (Brukner and Khan, 2007).

Current treatment for MTSS

Therapies other than massage

Despite plentiful research into the risk factors and causes of MTSS there is little research on the treatment of MTSS. The majority of treatments are based on clinical experience and or expert opinion (Galbraith and Lavallee, 2009). The conservative treatment options for MTSS include:

Acute phase

Rest, decreasing load (usually by decreasing activity) and ice (Galbraith and Lavallee, 2009). Ice is generally applied after exercise to reduce inflammation) (Galbraith and Lavallee, 2009). Anti-inflammatory medication may also be prescribed in this phase. Therapies such as ultrasound, whirpool baths, phonophoresis, augmented soft tissue mobilisation, electrical stimulation and unweighted ambulation many be used in this phase also (Galbraith and Lavallee, 2009).

Recent research has investigated the use of Kinesio tape to reduce the load in MTSS (Griebert et al., 2013).

Sub-acute phase

Modification of training including graded increases in activity, addressing biomechanical abnormalities and training surfaces/gradients to provide more shock absorption and cause less strain. Cross training options are often provided to the sufferer (Galbraith and Lavallee, 2009).

Strengthening and stretching exercises are often prescribed in this phase. Stretching of the calves and strengthening of the tibialis anterior are common exercises. Addressing core stability may also be prescribed (Galbraith and Lavallee, 2009).

Manual therapy including osteopathic manipulation, physical therapy, physiotherapy, and or massage therapy is commonly used to treat MTSS in this phase (Galbraith and Lavallee, 2009).

Addressing risk factors such as footwear, biomechanics, use of orthotics, proprioceptive training, and female issues, are treated in the sub-acute phase (Galbraith and Lavallee, 2009).

Splinting and bracing may also be recommended but only for more severe cases of MTSS (Galbraith and Lavallee, 2009).

Despite its clinical use, there is very little evidence of benefit for any of the above mentioned treatments of MTSS. The current evidence shows little effectiveness for any therapy including lower leg braces, low energy laser treatment, stretching and stretching exercises, sports compression stockings, and pulsed electromagnetic fields (Winters et al., 2013). The study by Griebert et al (2013) found that Kinesio tape reduced loading, however the effectiveness of the tape in treating MTSS was not investigated.

Massage

In clinical practice massage therapy is used in the treatment of MTSS to decrease inflammation (lymphatic drainage, ice massage) and or to relieve hypertonic muscles associated with MTSS such as the muscles of the calves, and anterior lower leg. However, there is little evidence of any benefit from massage treatment of MTSS. The most commonly cited massage treatment for MTSS is ice massage (Moen et al., 2009; Tolbert and Binkley, 2009; Winters et al., 2013). A systematic review of the treatment of MTSS found that ice massage could be effective when compared with a control (no treatment) however it showed no significant difference between the other three treatment interventions administered (Iontophoresis, Ultrasound and Phonophoresis) (Winters et al., 2013).

The two hypotheses

The two most common hypotheses as to what precisely occurs in the lower leg to cause the symptoms seen in MTSS are the periosteal traction hypothesis and the bony overload hypothesis.

The periosteal traction hypothesis, suggests that anatomical structures have the potential to impart a traction force on the tibia and its periosteum (Beck, 1998; Brukner, 2000; Brukner and Khan, 2007; Moen et al., 2009). The tissue source of pain in MTSS was long believed to be the origin of the tibialis posterior muscle however anatomical studies have shown that the site of pain corresponds to the origin of the medial soleus and not tibialis posterior (Beck, 1998; Brukner and Khan, 2007). The soleus, the deep crural fascia (DCF) and flexor digitorum longus (FDL) muscles all have attachments on the posteromedial aspect of the distal two thirds of the tibia and it has been suggested that soleus might prove to be the main culprit in MTSS (Brukner, 2000; Yates and White, 2004). Further research has disputed this stating that the soleus muscle does not commonly attach to the medial distal one