

CASE REPORTS

PHYSICAL EXERCISE AND LEG PAIN - WHAT IS THE RELATIONSHIP?

EXERCÍCIO FÍSICO E DORES NAS PERNAS - QUAL A RELAÇÃO?

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ABSTRACT

Shin splint, also known as tibial stress syndrome, results from an underlying stress reaction of the tibia caused by overuse. The patient typically refers a diffuse pain along the anteromedial side of the tibia, which is worse in late afternoon and associated with over-exercising days.

Diagnosis is confirmed by a prototypical history and physical examination findings. Radiological evaluation assists in differential diagnosis. Treatment consists of adequately resting or changing training routines, together with analgesic drugs.

Herein is presented the case of an adolescent referred to our Pediatric Rheumatology Unit with diffuse pain in the right pretibial region due to intensive exercise. Laboratory study and imaging exams were unremarkable. Clinical improvement following reduced exercise intensity supported diagnosis.

Keywords: exercise; overuse; shin splint; stress fracture; tibial stress syndrome

RESUMO

A síndrome “*shin splint*”, também designada por síndrome de stress tibial, resulta de uma lesão de stress sobre a tibia secundária ao seu uso excessivo. Tipicamente, o doente queixa-se de uma dor difusa ao longo da face anteromedial da tibia, de predomínio vespertino, agravada nos dias de atividade física intensa.

O diagnóstico é confirmado por história clínica típica e por achados ao exame físico. Os exames radiológicos auxiliam o diagnóstico diferencial. O tratamento inclui repouso ou alteração do plano de treino, assim como analgesia.

É apresentado o caso de uma adolescente referenciada à Unidade de Reumatologia Pediátrica por dor difusa na região pré-tibial direita relacionada com exercício excessivo. Os estudos analítico e radiológico não revelaram alterações. A melhoria clínica coincidente com a redução da intensidade do exercício físico sustentou o diagnóstico.

Palavras chave: exercício; sobreutilização; *shin splint*; fratura de stress; síndrome de stress tibial

INTRODUCTION

Lower extremity musculoskeletal (LEM) pain has several possible etiologies: trauma, infections, inflammatory processes, hematological or oncological diseases, idiopathic causes, and overuse.¹

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Regular physical activity has a number of health benefits, both physically and mentally, but awareness about risks associated with over-exercising is important. Persistent LEM pain may result from overuse syndrome or from stress fractures.¹

Overuse injuries may involve bone, periosteum, and tendon and occur when repetitive microtrauma to the bone exceeds the biological healing potential.²⁻⁵ These injuries are common in high school athletes, especially those who practice sports of cross country running and gymnastics.⁵

Shin splints refer to a stress reaction of the tibia from overuse, known as tibial stress syndrome (TSS).⁵ History and physical examination findings can distinguish tibial stress reactions from other leg pain causes.⁵

The significance of this condition is important to understand, so as to avoid unnecessary demand for health services.

CASE PRESENTATION

A 17-year-old, previously healthy girl was referred to our Pediatric Rheumatology Unit with diffuse pain in the right pretibial (medial third) region with approximately two months of evolution. Complaints appeared with exercise intensification during gymnastics training sessions. Pain was worse in the right pretibial crural region, but it was also present in the right knee and posterior calf muscle region of the homolateral leg.

The mechanical pain pattern was worse in mid-late afternoon and evening and it was coincident with exercising days. The girl had no systemic symptoms or local erythema/edema. Pain persisted even when treated with nonsteroidal anti-inflammatory drugs or acetaminophen and local ice application. The girl attended a sports course and was asymptomatic during scholar vacations.

On physical exam, clinical features were unremarkable except for the pain reported during circumferential touching of the right leg. The patient could support her weight on the right leg. No swelling or deformity were present, neither was pain on articular palpation or passive/active mobilization or articular swelling.

Laboratory study (complete blood count, erythrocyte sedimentation rate, C-reactive protein, and biochemistry including phosphocalcic metabolism) and leg radiography were normal. Osteoarticular scintigraphy was also normal, except for the stress fracture.

TSS diagnosis was assumed and reduction in exercise intensity suggested, with subsequent clinical improvement. Two years later, the girl remains asymptomatic.

DISCUSSION

Lower extremity musculoskeletal pain is common in childhood and affects up to 16% of the school-aged population.¹ Approximately half of sport pathologies in pediatric age are secondary to excessive

physical exercise (overuse).^{2,3} They are the result of a disequilibrium mismatch between activity intensity and duration and compensatory rest, leading to repeated microtraumas by exceeding the tissues' regeneration capacity.²⁻⁵

TSS, also known as shin splint syndrome, more frequently affects females.^{2,5,6} It usually manifests as a diffuse pain along the posteromedial side of the tibia, in the medial or distal third, usually with unilateral symptoms.^{2,4,5,7} The diagnosis is clinical, based on clinical history and physical examination.^{3,5,7,8} Diffuse pain triggered by posteromedial palpation of the tibia is the most sensitive sign.^{3,7} Treatment is conservative, based on partial rest and analgesic drugs.^{5,10}

In this case, unilateral pain led to the exclusion of a structural lesion, such as stress fracture.

Stress tibial fractures are common in athletes, with an incidence between 10 to 20%.⁸ The differential diagnosis between TSS and stress fractures is not always easy, particularly when pain is unilateral.⁷ Despite clinically similar, in stress fractures pain is usually more localized, present in the medial third of the anterior side of the tibia, and generally evident during exercise, rest, and even at night.^{4,7} Bone scintigraphy usually shows an increased radiotracer uptake in the fracture spot. Magnetic resonance imaging (MRI) is the gold standard to confirm diagnosis.^{5,8,10}

In this clinical case, age and presence of unilateral pain or a triggering factor excluded the diagnosis of growing pains. The exams further helped to exclude osteochondrosis and bone tumors.

Clinical improvement after reduction in exercise duration and intensity together with normal imaging exams corroborated the diagnosis.

According to the literature, management of stress fractures is based on the risk of fracture progression and injury severity at presentation. Patients with high-risk stress fractures should bear no weight on the injured leg by using crutches and be referred to an orthopedic surgeon. For all the remaining patients, treatment consists of adequate rest and exercise modifications. Some authors also recommend optimization of vitamin D and calcium intake in all patients.⁵

In conclusion, only knowledge of this condition can prevent diagnostic delay and unnecessary demand for health services, diagnostic tests, and detrimental therapeutics. In the present case, recognition of intense sports activity (consisting of daily exercise including impact sports, like running and jumping) was key for diagnosis.

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