

## Editorial

# Exercise for Patellar Tendinopathy

**Stasinopoulos Dimitrios\***

Chairperson Department of Health Sciences, Assistant Professor, Physiotherapy, Coordinator of MSc in Sports Physiotherapy, Coordinator of PhD in Physiotherapy Program, Director of Cyprus Musculoskeletal and Sports Trauma Research Centre (CYMUSTR EC) Physiotherapy Program, Dep. of Health Sciences, School of Sciences, Nicosia, Cyprus

**\*Corresponding author:** Stasinopoulos Dimitrios, Chairperson Department of Health Sciences, Assistant Professor, Physiotherapy Program, Dept. of Health Sciences, School of Sciences Coordinator of M.Sc in Sports Physiotherapy, Coordinator of PhD in Physiotherapy Program 6, Diogenes Str. Engomi, Nicosia, Cyprus

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Chronic patellar tendinopathy is one of the two most common tendinopathies of the lower limb. It is a degenerative condition and not an inflammatory one. Diagnosis is based on defining pain features for example localized pain in the inferior pole of the patella which is the most common site of patellar tendinopathy as well as reproducing pain with specific clinical tests and palpation. Although the signs and symptoms of tendinopathy are relatively clear, to date, no ideal treatment has emerged. Many physiotherapy techniques have been recommended for the treatment/rehabilitation of patellar tendinopathy such as electrotherapeutic (ultrasound, ESWT, laser, iontophoresis) and non-electrotherapeutic modalities (exercise programs, soft tissue manipulation, and acupuncture). All the above-mentioned treatments intend to improve symptoms (pain and function) of patellar tendinopathy but have totally different mechanisms of action. However, a treatment is effective when it reverses the pathology of the tendinopathy and not only improve the symptoms.

Nowadays, eccentric training of the “injured” tendon is the most commonly used conservative approach in the treatment of tendinopathy [1]. However, Malliaras and his colleagues [2] performed a systematic review of studies comparing two or more loading programs in achilles and patellar tendinopathy. They concluded that clinicians should consider eccentric-concentric loading alongside or instead of eccentric loading. Recently, isometric exercises have been recommended to reduce and manage patellar tendon pain [3] and initiate muscle-tendon unit loading when pain limits the ability to perform isotonic exercises [4]. Otherwise, isometric evidence is currently limited to the patellar tendon. Furthermore, eccentric training of the injured tendon alone is not effective for many patients with tendinopathies [5]. Therefore, eccentric training of the injured tendon is combined with static stretching exercises of the injured tendon in the treatment of tendinopathies as it was first proposed by Stanish et al [6].

A component lacking from evidence-based programs is adequate consideration of the kinetic chain. Poor lumbopelvic control has the potential to alter load distribution on the lower limb kinetic chain and increase the risk of lower limb tendinopathy. It is our belief that the improvement of lumbo-pelvic control can be achieved by performing simple exercises such as single leg bridging in supine and four point prone bridging exercises [7,8]. Future research is needed to confirm this suggestion.

In addition, hip extensor weakness has been associated with patellar tendinopathy [9]. Exercises to strengthen these muscle groups should be considered in exercise protocols and patellar tendinopathy. Functional activities such as jumping, cutting and sprinting should also be included in lower limb tendinopathy rehabilitation programs among athletes, but have so far not been included in popular programs in the literature [9,10].

According to previous reported issues, it is time to stop strengthening the tendon only eccentrically. Isometric, concentric-eccentric, stretching-eccentric and isolated eccentric loading may be indicated depending on factors multiple factors such as pain, function, age, site of tendinopathy, access to equipment, etc. The tendinopathy management should be based on a progressive loading of the lower extremity (kinetic chain), muscle-tendon unit, and tendon itself. However, the optimal protocol of exercise training needs to be investigated.

Patellar tendinopathy pain can also be reported, apart from the inferior pole of the patella, at the tibial tuberosity, at the superior pole of the patella and at the midportion of the tendon [10]. Future well-designed studies are needed to find out the appropriate protocol of exercise training for each site of patellar tendinopathy.

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