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ISOKINETIC STRENGTH PROFILE OF SUBJECTS WITH PROXIMAL PATELLAR TENDINOPATHY

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Introduction:

Patellar tendinopathy (PT) is relatively common among sportsmen. Its incidence is reported to be in the range of 7 – 40%. Even if there exist lots of study to understand its physiopathology, to evaluated its mechanical repercussions and to propose treatments, however, the quadriceps strength profile of subjects with proximal patellar tendinopathies remains poorly described.

Aim of the Study:

We aimed to determine the strength profile (difference of muscular performance between the healthy and pathological limb measure by an isokinetic dynamometer) of subjects suffering of this chronic pathology. This could perhaps provide the therapist with rationale information contributing to adapt their treatment for patient in such condition.

Material and Methods:

43 subjects with chronic proximal patellar tendinopathy were involved. It has been based on the evaluation of the quadriceps and the hamstrings muscular performance of the healthy and pathological member on isokinetic dynamometer at the speed of 60°/s (C60) and of 240°/s (C240) in concentric mode and at the speed of 30°/s (E30) in eccentric mode. A visual analogic scale of pain (VAS) has been also realized after each isokinetic test.

Results

The results of the isokinetic tests comparing the healthy to the pathological limb are meaningful for the different conditions of contraction and test speeds, just like the results of the VAS associated to those tests ($p<0,01$). Indeed, pathological knees had a maximum peak torque for the quadriceps in C60 lower than healthy. Table 1 shows the mean and standard deviation MT values obtained for each protocol. The MTm results are presented as whisker plots in Fig 1 and Fig 2. Looking at the values in Table 1, one can see that albeit the values for the E30 tests are fairly similar those for the C60, the difference between the healthy and the pathologic limb is not significant. This observation is to be attributed to the inter-individual variability (Fig 3). We report in Table 2 the mean values and standard deviation for the difference in VAS value between the two legs.

Table I. Maximum torque mean values and standard deviations for each isokinetic protocol. (*) indicates a significant difference between the healthy and the pathologic limb.

		E30	C60	C240
Quadriceps	Healthy (N.m)	199.6 ± 72.0	193.4 ± 35.6	123.2 ± 27.4
	Pathologic (N.m)	174.8 ± 67.3	170.5 ± 44.6 (*)	114.3 ± 30.0
Hamstrings	Healthy (N.m)		103.6 ± 22.8	66.0 ± 15.0
	Pathologic (N.m)		97.2 ± 21.9 (*)	63.1 ± 13.5

Table II: Pain difference between the pathologic and the contralateral limb assessed by a visual analog scale

Δ VAS QE30	Δ VAS QC60	Δ VAS QC240
5.08 +/- 3.02	3.43 ± 2.80	2.84 ± 2.35

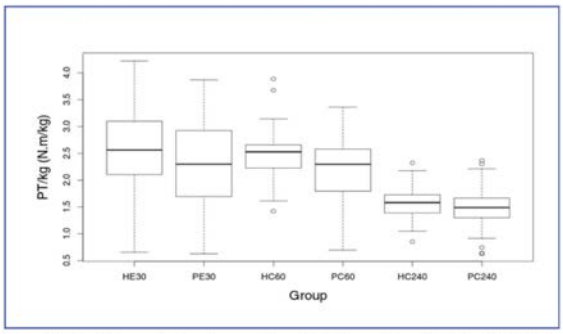

Figure 1: Bodyweight normalized peak torque whisker plot for the quadriceps. P=Pathologic, H=Healthy, E=Eccentric, C=Concentric

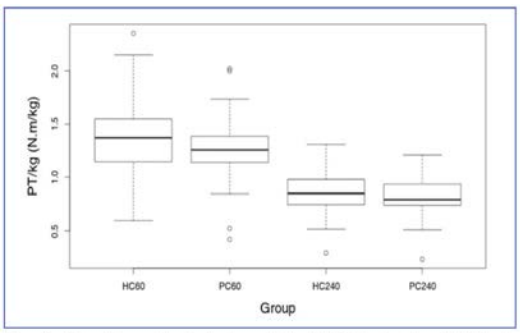

Figure 2: Bodyweight normalized peak torque whisker plot for the hamstrings. P=Pathologic, H=Healthy, E=Eccentric, C=Concentric

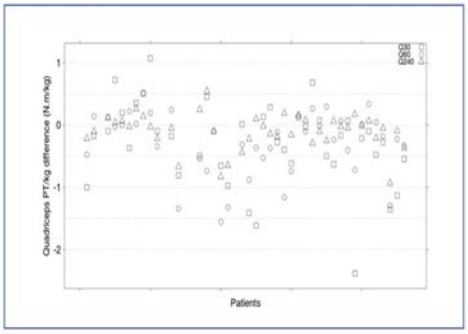

Figure 3: Bodyweight normalized peak torque difference scatter plot for the quadriceps

Conclusions:

In our study, the isokinetic results show a significant difference in performance isokinetic between the healthy and the pathological limb as well as VAS associated with these tests. However, the diversity of outcomes recorded in the patients suggests us that an individualized treatment is the case of patellar tendon pathology. Finally, it would seem that an isokinetic test in eccentric in some patients is, in addition to a test of provocation of the tendon, a pain assessment tool.