The myotendinous junction plasticity following aerobic exercise

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The myotendinous junction (MTJ) is the site where muscle contractile force is transmitted from the myofibrils across the plasma membrane to the tendon extracellular matrix (ECM), therefore it is a key structure for the locomotor system [1]. In this work, we investigated the relationship between ultrastructural adaptations and the MTJ protein complex modulation after aerobic exercise. In particular, the answer of this anatomical interface to a month of moderate aerobic exercise has been analysed in Sprague-Dawley rats by means of confocal and transmission electron microscopy. Morphological observations confirm the exercise ability to increase the contact area between tissues, increasing the complexity of tendon finger-like processes, which penetrate into the muscle mass. Moreover, these observations suggest a possible MTJ protein complex adaptation after exercise. Confocal images, associated to an immunofluorescence quantification, confirm these ultrastructural observations. Taking together these data reveal that MTJ is a plastic interface. This plasticity can be induced by exercise, which is able to increase the contact area between tissues and to induce a protein synthesis at MTJ level.

References


Keywords

Myotendinous junction, exercise, muscle, tendon, morphology, training