

The effects of functional and isometric warm-up activities regarding the hip joint abductors

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Introduction

During unilateral movements the extent of the knee valgus gets augmented (Czasche 2017), (Distefano et al 2009). This constrained joint position puts tremendous pressure to the anterior cruciate ligaments (ACL). In our research, we hypothesise that an appropriately chosen, targeting and improving the hip joint muscle group's electric activity, warm up protocol becomes the solution of avoiding knee injuries.

Method

In our protocol 14 healthy, sport major university student women have taken part. None of them were an elite athlete and neither of them had any lower limb injury. All of the participants have carried out both the functional and isometric warm up protocols. Having placed EMG sensors and bipolar surface electrodes superficially onto the m. gluteus medius (GM), m. biceps femoris (BF), m. vastus lateralis (VL) the participants performed two MVC (Maximal Voluntary Contraction) tests. Both the bilateral and the unilateral CMJs (Countermovement Jump) were performed from a Tenzi powerslate. We measured the extent of the knee valgus and pelvis tilt via movement analysing sensors.

Results

The normalized activity of the GM, in the unilateral jump up tests, has increased due to the functional warm up protocol by 37,6%, while the activity of the same muscle in the isolated condition, has decreased by 47,2%. Knee valgus extent, as a result of the functional condition, has reduced, closely to the 0,05-significance level. Having the valgus results below 10 degrees erased from the database and despite the small number of participants, the result of significance was $p=0,154$. Performing the functional protocol, the activity of the GM has, nearly significantly increased, where $p=0,119$.

Conclusion

At the bi and unilateral jumps, following the isolated protocol the extent of the knee valgus shows an increasing tendency, presumably because of the fatigue the isolated protocol may have caused. Our results can have an outstanding role in the fields of sport studies as the increase of GM activity and simultaneously the reduction of knee valgus can lessen the risk of injuries.

Keywords: knee valgus, EMG, movement analysing sensors, functional, isolated warm up protocol