

Testing, performance and injury prevention of the hamstring in sprinters.

Hamstring strain injuries have a high prevalence in many sports that involve high-speed running. The risk of strain is at its highest in the late swing phase of sprinting. During this last, the hamstrings are undergoing an active lengthening contraction (i.e. eccentric) and reach their peak force. From a kinematic point of view, this phase brings the hip into flexion at an angle of more than 70°, with the knee extending to less than 40° of flexion. The combination of hip flexion and knee extension induces a substantial elongation stress on the hamstrings.

Current hamstring injury-prevention programs are based on eccentric training. It has been shown to be an efficient method to address some injury risk factors (e.g. weakness, lower hamstring to quadriceps ratio, decrease in optimum length, ...). However, most of the investigations on this topic have used trainings methods with either no or nonspecific hip flexion (e.g. Nordic hamstring exercise). The hamstrings were, then, not stretched to the extent they are at the end of the swing phase.

Therefore, the aim of this doctoral thesis is 1) to investigate the influence of hip flexion on hamstring activity (peak force, EMG activity, fatigability, ...) and 2) to compare the effects of two programs based on eccentric training: one without and one with a specific hip flexion.

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