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Musculoskeletal

Neurodynamic exercises for hamstring flexibility

...are they more effective than other interventions?

Author : José Pedro Correia

This meta-analysis found that neurodynamic exercises were effective in increasing knee extension range of motion (ROM) and passive straight leg raising (SLR) when compared to no intervention and other techniques.

Effect sizes ranged from -2.28 to -0.21 for knee extension ROM and from 0.44 to 2.55 for passive SLR when compared to control groups or other interventions. However, the authors did warn that study heterogeneity was a concern.

Limited posterior chain flexibility is commonly found in athletic subjects; neurodynamic interventions, which may target both neural and non-neural structures, have been the focus of multiple studies to improve this limitation.

Given the fact that a recent systematic review found no effect of traditional stretching on hamstring injury prevention, this review investigated the effects of neurodynamic exercises on hamstring muscle flexibility compared to traditional interventions.

Six randomized controlled trials involving 294 participants were included in the study. Neurodynamic treatment was compared with no treatment, placebo, and with other techniques such as stretching, muscle inhibition and proprioceptive neuromuscular facilitation. Study quality was assessed using the Jadad score (0-5 points).

All included studies were graded as ?2 in terms of study quality. Heterogeneity in the meta-analysis was 88.5% for knee extension ROM and 82.72% for the passive SLR.

Despite these values, the best available evidence shows a more beneficial effect of neurodynamic exercises in hamstring flexibility when compared to other interventions.

Expert opinion

Despite the issue of study heterogeneity, this review shows promising results of using neurodynamic exercises to improve hamstring flexibility. This outcome is relevant for two major reasons:

- Hamstring/ posterior chain muscle shortening is frequently seen in a variety of athletes and in the general population
- Neurodynamic exercise mobilise both neural and non-neural tissue, which may have benefits both for tissue extensibility and for normalisation of neural control of muscle excitability

Given the easy application of these techniques, it should be included in programs that target knee extension range of motion in a wide range of populations in the rehabilitation setting.

Although it was not analysed in this review, neurodynamic exercises may also be used and play a role in injury prevention programs.