



Altered muscle activation patterns shown to cause hamstring injuries- a guide to correction

The Study

A study of sports people used surface electromyography (EMG) to compare the neurological control of those who had suffered hamstring injuries with normal controls. They found that those injured had abnormal sensorimotor neurological control of their muscles, specifically the activation timings of their muscles were altered. The authors speculate that this places a higher cumulative load on the hamstrings, noting that previous research has shown such abnormal sensorimotor control has been shown to increase the risk of hamstring injuries, and has also been associated with lower back pain, sacroiliac injuries and knee injuries. The author states that this abnormality could be screened for as a preventative measure, and should be addressed as part of rehabilitation.

The implications

The study identified a genuine problem. An abnormal muscle activation pattern causes the hamstrings to be overloaded, predisposing them to injury. Yes, it would be worthwhile being able to screen for this and address the issue when found. In order to do that though two important questions must be considered.

- How can this screening be done practically?
- Once the issue has been found how can it be fixed?

Screening

The researchers found the anomaly by analysing the the results of surface EMG. This is an excellent research tool, but would it be practical in all but professional sporting clubs? We discuss a practical alternative later in this article.

Can it be fixed

Without providing any supporting evidence the authors suggest that such sensorimotor abnormalities be remedied by focusing on controlled movement with exercises. However, as discussed in several research summaries in this guide corrective exercises do not correct such abnormalities. These abnormalities occur as a result of the Central Nervous System (CNS) making adaptations or compensations when part of the musculoskeletal system is not able to work normally. This commonly occurs when there are trigger points or articular dysfunction.

A sensible solution

As discussed elsewhere in this guide such abnormal activation patterns are compensations and adaptations made by the CNS. One study identified this occurring during shoulder abduction when trigger points were present in the shoulder muscles. The same research showed that upon treatment of these trigger points the muscle activation pattern returned to normal. It is assumed that articular dysfunctions can have similar affects, and are correctable using an adjustment or manipulation. A sensible solution would be to screen for causes of abnormal activation patterns rather than the activation pattenr itself. This is something that could be done by any qualified practitioner in a normal clinical setting. As discussed, attempting to correct the abnormal pattern directly using exercises does not work. However, it is certainly possible to treat trigger points and joint dysfunction.

References

Sole, G., Milosavljevic, S., Nicholson, H., & Sullivan, S. J. (2012). Altered muscle activation following hamstring injuries. Br J Sports Med, 46(2), 118-123.

Further information

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