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[Intervention Review]

Stretching to prevent or reduce muscle soreness after exercise

Robert D Herbert¹, Marcos de Noronha², Steven J Kamper¹¹Musculoskeletal Division, The George Institute for Global Health, Sydney, Australia. ²Physiotherapy, Universidade do Estado de Santa Catarina, Florianopolis, Brazil**Contact address:** Robert D Herbert, Musculoskeletal Division, The George Institute for Global Health, PO Box M201, Missenden Road, Camperdown, Sydney, NWS 2050, Australia. rherbert@george.org.au.**Editorial group:** Cochrane Bone, Joint and Muscle Trauma Group.**Publication status and date:** New search for studies and content updated (no change to conclusions), published in Issue 7, 2011.**Citation:** Herbert RD, de Noronha M, Kamper SJ. Stretching to prevent or reduce muscle soreness after exercise. *Cochrane Database of Systematic Reviews* 2011, Issue 7. Art. No.: CD004577. DOI: [10.1002/14651858.CD004577.pub3](https://doi.org/10.1002/14651858.CD004577.pub3).

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ABSTRACT

Background

Many people stretch before or after engaging in athletic activity. Usually the purpose is to reduce risk of injury, reduce soreness after exercise, or enhance athletic performance. This is an update of a Cochrane review first published in 2007.

Objectives

The aim of this review was to determine effects of stretching before or after exercise on the development of delayed-onset muscle soreness.

Search methods

We searched the Cochrane Bone, Joint and Muscle Trauma Group Specialised Register (to 10 August 2009), the Cochrane Central Register of Controlled Trials (2010, Issue 1), MEDLINE (1966 to 8th February 2010), EMBASE (1988 to 8th February 2010), CINAHL (1982 to 23rd February 2010), SPORTDiscus (1949 to 8th February 2010), PEDro (to 15th February 2010) and reference lists of articles.

Selection criteria

Eligible studies were randomised or quasi-randomised studies of any pre-exercise or post-exercise stretching technique designed to prevent or treat delayed-onset muscle soreness (DOMS). For the studies to be included, the stretching had to be conducted soon before or soon after exercise and muscle soreness had to be assessed.

Data collection and analysis

Risk of bias was assessed using The Cochrane Collaboration's 'Risk of bias' tool and quality of evidence was assessed using GRADE. Estimates of effects of stretching were converted to a common 100-point scale. Outcomes were pooled in fixed-effect meta-analyses.

Main results

Twelve studies were included in the review. This update incorporated two new studies. One of the new trials was a large field-based trial that included 2377 participants, 1220 of whom were allocated stretching. All other 11 studies were small, with between 10 and 30 participants receiving the stretch condition. Ten studies were laboratory-based and other two were field-based. All studies were exposed to either a moderate or high risk of bias. The quality of evidence was low to moderate.

There was a high degree of consistency of results across studies. The pooled estimate showed that pre-exercise stretching reduced soreness at one day after exercise by, on average, half a point on a 100-point scale (mean difference -0.52, 95% CI -11.30 to 10.26; 3 studies). Post-exercise stretching reduced soreness at one day after exercise by, on average, one point on a 100-point scale (mean difference -1.04, 95% CI -6.88 to 4.79; 4 studies). Similar effects were evident between half a day and three days after exercise. One large study showed that

stretching before and after exercise reduced peak soreness over a one week period by, on average, four points on a 100-point scale (mean difference -3.80, 95% CI -5.17 to -2.43). This effect, though statistically significant, is very small.

Authors' conclusions

The evidence from randomised studies suggests that muscle stretching, whether conducted before, after, or before and after exercise, does not produce clinically important reductions in delayed-onset muscle soreness in healthy adults.

PLAIN LANGUAGE SUMMARY

Stretching to prevent or reduce muscle soreness after exercise

Many people stretch prior to or after engaging in physical activities such as sport. Usually the purpose is to reduce the risk of injury, reduce soreness after exercise, or enhance athletic performance. This review looked at the effects of stretching on muscle soreness only.

The review located 12 relevant randomised controlled studies looking at the effect of stretching before or after physical activity on muscle soreness. Eleven studies were small with between 10 to 30 people being allocated stretching exercises. In contrast, one study was large with 2337 participants, 1220 of whom were in the stretching group. Ten studies were conducted in laboratories using standardised exercises. The only two studies, which included the only large study, were so-called field-based studies. These examined the effect of stretching on muscle soreness associated with self-selected physical activity. The studies were of low to moderate quality. Some of the studies examined the effects of stretching before physical activity, some examined the effects of stretching after physical activity, and some examined effects of stretching both before and after physical activity.

The studies produced very consistent findings. They showed there was little or no effect of stretching on the muscle soreness experienced in the week after the physical activity.