Does heat or cold work better for acute muscle strain?

Evidence-based answer

Cryotherapy is better than heat for treating acute muscle strain (strength of recommendation [SOR]: C, consensus, usual practice, and expert opinion).

Insufficient patient-oriented evidence exists regarding use of heat to treat acute soft-tissue injuries.

Evidence summary

A comprehensive review of the literature revealed no studies that compare heat and cryotherapy to treat acute soft-tissue injury. Well-designed human trials of general management of acute soft-tissue injury are rare.1

Cryotherapy has been the recommended initial treatment for muscle strain for more than 30 years, based generally on expert opinion and physiological models, not clinical trials.2 Theoretically, cryotherapy controls hemorrhage and tissue edema, whereas heat enhances the inflammatory response.2

One human RCT and animal studies find benefits from cold

A 2007 review evaluated 66 publications and found only 1 randomized controlled trial conducted on humans.1 The intervention in this trial involved applying cold gel 4 times a day for the first 14 days after the injury. The control group received a room-temperature gel application; neither group was aware of the temperature differential.

The study found significant reduction in pain at rest, pain with movement, and functional disability at intervals of 7, 14, and 28 days postinjury (P<.001) among patients receiving cold-gel applications. Patients receiving cold-gel treatment also reported increased satisfaction with treatment compared with the controls. At 28 days, cold-gel treatment patients scored 71 on a 100-point satisfaction scale compared with 44 for controls (P<.001).3 Inconclusive results or significant design flaws limited the validity of all other trials cited in this review.3

Laboratory studies on rats have also demonstrated beneficial effects of cryotherapy after simulated soft-tissue injuries.4,5 One study cited a significant reduction in inflammatory cells, based on histologic examination, in 43 rats between 6 and 24 hours after trauma.4 A second study of 21 rats showed improvement in associated physiological components with cryotherapy, but no statistically significant improvement in edema.5

How cold is too cold?

Most authorities recommend empiric treatment with cryotherapy during the acute inflammatory phase—the first 24 to 48 hours after injury.6 Although not rigorously studied, some sources recommend applying cold to the involved muscle for...
NSAIDs, Aspirin, and Warfarin—Serotonin release by platelets plays an important role in hemostasis. Epidemiological studies of case-control and cohort studies have demonstrated an association between use of psychotropic drugs that interfere with serotonin reuptake and the occurrence of upper gastrointestinal bleeding. These studies have also shown that concurrent use of an NSAID or aspirin may potentiate this risk of bleeding. Antidepressant drugs, including increased bleeding, have been reported when SSRIs and SNRIs are coadministered with warfarin. Patients receiving warfarin therapy with psychiatric drugs should be advised to avoid alcohol consumption while taking Pristiq. Potential for Other Drugs to Affect Desvenlafaxine—In vitro studies have shown minimal inhibitory effect of desvenlafaxine on clinical thrombolytic assays. In vitro studies have shown that desvenlafaxine does not have a clinically relevant effect on CYP2D6 metabolism at the dose of 100 mg daily. Furthermore, in vivo use of desvenlafaxine with a drug metabolized by CYP2D6 can result in higher concentrations of that drug. Drugs metabolized by CYP2C9 and CYP3A4 are likely to affect the pharmacokinetics of drugs that are metabolized by these CYP enzymes, P-glycoprotein Transporter. In vivo, desvenlafaxine is not a substrate or an inhibitor for the P-glycoprotein transporter. The pharmacokinetics of Pristiq are unlikely to be affected by drugs that inhibit the P-glycoprotein transporter, and desvenlafaxine is not likely to affect the pharmacokinetics of drugs that are substrates of the P-glycoprotein transporter. Electronic Medication Therapy—There are no current clinical data establishing the risks and/or benefits of electroconvulsive therapy combined with Pristiq treatment. USE IN PREGNANT POPULATIONS: Pristiq should be used in pregnancy only if the potential benefits justify the potential risks. Non-teratogenic effects. Neonates exposed to Pristiq (Serotonin-Norepinephrine Reuptake Inhibitors), or SSRIs (Serotonin Reuptake Inhibitor) in the third trimester of pregnancy have developed complications requiring prolonged hospitalization, respiratory support, and tube feeding. Such complications can arise immediately upon delivery. Reported clinical findings have included respiratory distress, cyanosis, apnea, seizure, jitteriness, irritability, hypoglycemia, hypotension, hyperpyrexia, hypertension, tachycardia, bradycardia, tachycardia, and initial sleep EEG abnormalities. These features are associated with either a direct toxic effect of SSRIs and SNRIs or, possibly, a drug discontinuation syndrome. It should be noted that, in some cases, the clinical picture is consistent with serotonin syndrome (see Warnings and Precautions). When treating a pregnant woman with Pristiq, the benefits of therapy should be considered carefully against the potential risks of the drug to the fetus. In the third trimester, the physician should carefully consider the potential risks and benefits of treatment (see Clinical Pharmacology (12.4), Use in Special Populations (8.1) and Precautions (5.10)). The effect of Pristiq on labor and delivery in humans is unknown. Pristiq should be used during labor and delivery only if the potential benefits justify the potential risks. Non-teratogenic effects. Desvenlafaxine is secreted in human milk. Because the potential for serious adverse reactions in nursing infants from Pristiq, a decision should be made whether to discontinue nursing or to discontinue the drug, taking into account the importance of the drug to the mother. Pristiq is not recommended for use during pregnancy only if the potential benefits justify the potential risks. Non-teratogenic effects. 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