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Modulation of pain in osteoarthritis: the role of nitric oxide.

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BACKGROUND: Patients with osteoarthritis (OA) may experience severe pain, progressive loss of movement function, and disability. Many pain-relieving medications are not effective, and are not able to improve the existing pathology. **OBJECTIVES:** This review summarizes (1) the pathology, mechanisms of pain production, and conservative management of OA with respect to pain; and (2) explains the role of nitric oxide (NO) in pain reduction and production, especially as related to OA. **DISCUSSION:** NO is produced in biologic cells by a family of enzymes referred to as the nitric oxide synthases (NOSs). The beneficial or harmful effects of different isoforms, constitutive NOS (cNOS) and inducible NOS (iNOS), respectively, suggest dual effects of NO in biologic structures. The harmful effects of NO are most often reported in the literature. We suggest that (1) NO via the beneficial cNOS pathway is decreased in joint structures exposed to chronic load-induced stresses and biochemical change-induced stresses, (2) monochromatic infrared light energy at an 890 nm wavelength, applied at the skin surface, is absorbed into blood vessels and stimulates production of NO in joints by the beneficial cNOS pathway, (3) NO from the cNOS pathway may help decrease the detrimental effects of NO induced by iNOS and produced in OA pathology, and (4) NO-based intervention may produce substantial pain relief without undesirable side effects by increasing circulation, decreasing nerve irritation, and decreasing inflammation in joints. **KEY MESSAGES:** (1) The roles of NO in nociception are dual and complex. (2) NO via cNOS, produced transiently in small amounts, can bring dramatic relief to people with painful OA.

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