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Ketamine reduces muscle pain, temporal summation, and referred pain in fibromyalgia patients.

Graven-Nielsen T[1], Aspegren Kendall S, Henriksson KG, Bengtsson M, Sörensen J, Johnson A, Gerdle B, Arendt-Nielsen L.

Author information

Abstract

Central mechanisms related to referred muscle pain and temporal summation of muscular nociceptive activity are facilitated in fibromyalgia syndrome (FMS) patients. The present study assessed the effects of an NMDA-antagonist (ketamine) on these central mechanisms. FMS patients received either i.v. placebo or ketamine (0.3 mg/kg, Ketalar((R))50% decrease in pain intensity at rest by active drug on two consecutive VAS assessments). Fifteen out of 17 ketamine-responders were included in the second part of the study. Before and after ketamine or placebo, experimental local and referred pain was induced by intramuscular (i.m.) infusion of hypertonic saline (0.7 ml, 5%) into the tibialis anterior (TA) muscle. The saline-induced pain intensity was assessed on an electronic VAS, and the distribution of pain drawn by the subject. In addition, the pain threshold (PT) to i.m. electrical stimulation was determined for single stimulus and five repeated (2 Hz, temporal summation) stimuli. The pressure PT of the TA muscle was determined, and the pressure PT and pressure pain tolerance threshold were determined at three bilaterally located tenderpoints (knee, epicondyle, and mid upper trapezius). VAS scores of pain at rest were progressively reduced during ketamine infusion compared with placebo infusion. Pain intensity (area under the VAS curve) to the post-drug infusion of hypertonic saline was reduced by ketamine (-18. 4+/-0.3% of pre-drug VAS area) compared with placebo (29.9+/-18.8%, P<0.02). Local and referred pain areas were reduced by ketamine (-12. 0+/-14.6% of pre-drug pain areas) compared with placebo (126.3+/-83. 2%, P<0.03). Ketamine had no significant effect on the PT to single i.m. electrical stimulation. However, the span between the PT to single and repeated i.m. stimuli was significantly decreased by the ketamine (-42.3+/-15.0% of pre-drug PT) compared with placebo (50. 5+/-49.2%, P<0.03) indicating a predominant effect on temporal summation. Mean pressure pain

tolerance from the three paired tenderpoints was increased by ketamine (16.6+/-6.2% of pre-drug thresholds) compared with placebo (-2.3+/-4.9%, P<0.009). The pressure PT at the TA muscle was increased after ketamine (42.4+/-9. 2% of pre-drug PT) compared with placebo (7.0+/-6.6%, P<0.011). The present study showed that mechanisms involved in referred pain, temporal summation, muscular hyperalgesia, and muscle pain at rest were attenuated by the NMDA-antagonist in FMS patients. It suggested a link between central hyperexcitability and the mechanisms for facilitated referred pain and temporal summation in a sub-group of the fibromyalgia syndrome patients. Whether this is specific for FMS patients or a general phenomena in painful musculoskeletal disorders is not known.

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Publication types, MeSH terms, Substances

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