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Effect of resveratrol on the hyperexcitability of nociceptive neurons associated with ectopic hyperalgesia induced by experimental tooth movement

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The present study investigated whether, under in vivo conditions, systemic administration of resveratrol attenuates the experimental tooth movement-induced ectopic hyperalgesia associated with hyperexcitability of nociceptive trigeminal spinal nucleus caudalis (SpVc) neurons. The threshold of escape from mechanical stimulation applied to the ipsilateral whisker pad in rats exposed to experimental tooth movement was significantly lower than seen in control rats from day 1 to 3 following movement of the right maxillary first molar tooth. The lowered mechanical threshold in the rats exposed to experimental tooth movement had almost returned to the level of sham-treated naïve rats at day 3 following administration of resveratrol. The mean mechanical threshold of nociceptive SpVc neurons was significantly lower after experimental tooth movement but the lower threshold could be reversed by administration of resveratrol. The higher discharge frequency of nociceptive SpVc neurons for noxious mechanical stimuli observed in rats exposed to experimental tooth movement was statistically significantly lower following resveratrol administration. These results suggest that resveratrol attenuates experimental tooth movement-induced mechanical ectopic hyperalgesia via suppression of peripheral and/or central sensitization. These findings support the idea that resveratrol, a complementary alternative medicine, is a potential therapeutic agent for the prevention of experimental tooth movement-induced ectopic hyperalgesia.

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ハイライト: これまでに赤ワインに含まれるレスベラトロールの炎症性疼痛抑制効果は判明しておりましたが、今回我々は、実験的に歯の矯正処置をした動物で生じる異所性痛覚過敏がレスベラトロールの連日投与で緩和されることを行動学的及び電気生理学的手法を用いて明らかと致しました。「レスベラトロール」が歯科矯正時に生じる異所性痛覚過敏を緩和することより補完代替医療に応用できる可能性を指摘致しました。