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Local anesthetic effect of docosahexaenoic acid on the nociceptive jaw-opening reflex in rats

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Although docosahexaenoic acid (DHA) administration suppresses sodium channels in primary afferent sensory neurons, the acute local effect of DHA on the trigeminal nociceptive reflex remains to be elucidated, *in vivo.* Therefore, the aim of the present study was to investigate whether local administration of DHA attenuates the nociceptive jaw-opening reflex (JOR) *in vivo* in the rat. The JOR evoked by electrical stimulation of the tongue was recorded by a digastric muscle electromyogram (dEMG) in pentobarbital-anesthetized rats. The amplitude of the dEMG response was significantly increased in proportion to the electrical stimulation intensity (1–5x threshold). At 3x threshold, local administration of DHA (0.1, 10 and 25mM) dose-dependently inhibited the dEMG response, and lasted 40min. Maximum inhibition of the dEMG signal amplitude was seen within approximately10min. The mean magnitude of inhibition of the dEMG signal amplitude by DHA (25mM) was almost equal to the local anesthetic, 1% lidocaine (37mM), a sodium channel blocker. These findings suggest that DHA attenuates the nociceptive JOR via possibly blocking sodium channels, and strongly support the idea that DHA is a potential therapeutic agent and complementary alternative medicine for the prevention of acute trigeminal nociception

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ハイライト： 侵害受容開口反射の指標である顎二腹筋で記録された筋電図の振幅がドコサヘキサエン酸(DHA)の局所投与により、濃度依存的・可逆的に抑制されることが判明した。今回の発見は、これまで*in vitro*で確認されたDHAの電位依存性Na^+チャネル阻害剤としての可能性を, *in vivo*の条件下で初めて確認したものであり、また食品成分であるDHAは臨床的に使用されるNa^+チャネル阻害剤である1%リドカインとほぼ同等の局所麻酔効果が確認されたことから、補完代替医療に貢献する新たな知見として注目に値する成果と推察される。