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Dental pain during repetitive transcranial magnetic stimulation

Repetitive transcranial magnetic stimulation (rTMS) is being proposed as a non-invasive treatment with few side effects in patients with major depressive disorders [1,3,4,7]. The most common side effect of rTMS is the provocation of epileptic seizures [5,6], less frequently induction of migraine attacks, tension type headache or tinnitus [2] is reported. Stimulation over frontal areas can be uncomfortable for some subjects, due to local irritation of muscles and nerves underlying the stimulation coil [5]. The discomfort is related to the intensity and frequency of the stimulation [5]. Side effects at more distant locations are rarely reported.

A 57-year-old female patient with a 2-year history of major depressive disorder meeting ICD-10 criteria actually presented with a moderate depressive episode. In addition to psychopharmacotherapy (mirtazapine and lithium), rTMS treatment of the left dorsolateral prefrontal cortex was applied. The patient reported a pulsating, local dental twinge in the region of the upper left jaw correlated with the rTMS treatment. During the inter train interval the dental pain disappeared, but emerged again during the next train of stimuli. The intensity of pain gradually diminished during the course of treatment. The pain was found to be dependent on the stimulus intensity and remained despite repositioning the coil a few centimetres. In contrast, direct rTMS of the upper left jaw caused no pain. The physical examination of the oral region revealed no pathologies excepting a small amalgam restoration of the left upper second molar.

It remains unclear, which central or peripheral nerve structures might be involved in the generation of these pain sensations. Pain projected to the teeth via local irritation of the superficial temporal portion of the trigeminal nerve by the pulsating magnetic fields and projection via the *N. buccalis* into the dental region seems, to our mind, the most likely explanation for this phenomenon. A central pain origin, caused by irritation of the sensory cortex is considered to be less likely. In a patient with the sulcus centralis located more frontal than usual, stimulation of primary sensory areas is possible. However, this should cause sensations on the contralateral side and, so far, such sensations have not been reported. The amalgam inlay was intact and direct stimulation of the upper left jaw did not induce any pain in the dental region of the upper left jaw. Therefore, irritation of the local dental nerves by rTMS seems to be unlikely.

Our case showed that dental pain was a disturbing side effect of rTMS. Such side effects could be a reason for patients to cancel rTMS treatment. However, initial dental pain during rTMS may be tolerated by patients, if there was appropriate information provided prior to rTMS application. This case should draw more attention to possible side effects of rTMS. Accordingly, we recommend that patients be comprehensively informed about all possible side effects, infrequent or otherwise, related to rTMS therapy.

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