heat pain (HP) stimuli were assessed by visual analogue scale (VAS) and adjusted to elicit approximately 70/100 mm. Alternately pulse stimulations (pulse duration of 40 s; 0.025 Hz) which consisted of CP, HP, or neutral temperature (32 °C) were applied. Four conditions were tested and subjective sensations were assessed: (1) one QTSD was applied to non-dominant forearm and cold-heat pulse stimulation was applied.

Two QTSDs were applied to (2) non-dominant ipsilateral forearm with 5 cm apart, (3) non-dominant and contralateral forearms, (4) non-dominant forearm and ipsilateral thigh, respectively. In conditions of (2)–(4), CP-neutral pulse stimulation (C-Neutral) and neutral-HP pulse stimulation (Neutral-H) were applied simultaneously with opposite phase, respectively.

Results: CP and HP were 3.9 ± 1.0 °C (mean ± SD) and 43.6 ± 0.9 °C (mean ± SD), respectively. The VAS values for CP and HP were 73.4 ± 2.0 mm (mean ± SD) and 76.4 ± 4.8 mm (mean ± SD), respectively. Some subjects could not discriminate cold or heat sensation and some felt cold as heat (paradoxical sensation). The number of subjects with such paradoxical sensation in (1), (2), (3), (4) were 9 (45%), 2 (10%), 0 (0%) and 3 (15%), respectively.

Conclusions: In healthy volunteers, simultaneous alternately cold-heat pulse stimulation on one site triggered paradoxical thermal sensation, which to a much less degree is triggered when C-Neutral and Neutral-H were applied to different dermatomes. This suggests that the mechanism is primarily triggered peripherally.

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Assessing Offset Analgesia through electrical stimulations in healthy volunteers

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Background and aims: Offset Analgesia (OA) is a disproportionally large decrease of pain perception evoked by a slight decrease of a painful cutaneous heat stimulus, resulting in a lower pain perception compared to a simple constant stimulus at the same temperature. This study aimed to investigate the possibility of evoking the same disproportional analgesic effect by applying electrical stimuli.

Methods: 24 subjects underwent two control-trials of 30 s constant intensity by applying either heat stimulation at 48 °C or an electrical stimulation at 150% of the individual electrical Pain Detection (ePD) on the volar forearm. OA-trials consisted of a 30 s stimulation, divided into three periods: T1 (5 s), T2 (5 s), and T3 (20 s), with stimuli intensities of 48 °C, 49 °C and 48 °C or 150% of ePD, 180% of ePD, and 150% of ePD.

Subjects were asked to rate the pain intensity on an electronic Visual Analog Scale (VAS; 0: no pain; 10: worst imaginable pain), and were categorized as responders if they showed more than 30% lower VAS at heat OA-trials compared to heat control-trial. Repeated measures Analysis of Variance was applied to investigate the difference in pain intensity to the electrical OA-trials, compared with the electrical control-trials.

Results: Responders to the heat OA-trial also responded to the electrical OA-trial compared to the electrical control-trial, with an analgesic effect of 3.3 ± 0.5 VAS points ($P < 0.001$). However, when analyzing all subjects, no difference was found comparing the electrical OA-trial (VAS 3.8 ± 0.5) to the electrical control-trial (VAS 6.2 ± 0.4; $P > 0.5$).

Conclusions: This study suggests that responders to the heat OA-paradigm also respond to the electrical OA-paradigm.

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Metastatic lung cancer in patient with non-malignant neck pain: A case report

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Background: Symptoms from disseminated cancer can develop very slowly. This could be very difficult to distinguish those symptoms from chronic disabilities and nuisances in patients with chronic non-malignant pain.

Objective: In this report, the case of a woman with both non-malignant pain and cancer is presented.

Case report: A 54 years old woman was referred by a general practitioner to Multidisciplinary Pain Center. The diagnosis was chronic non-malignant neck pain on the basis of degenerative columnar disease. The patient was also suffering from osteoporosis. During the first visit in the Center, the patient complained of shooting pains in the neck and had tingling sensations in the fingers – most of his right hand. Moreover, the patient experienced shooting pains in the hips, lower back and spine. The multidisciplinary treatment with medication, physical therapy, TENS and cognitive behavioral therapy was offered. Paracetamol together with gabapentin was used. The patient experienced relief of pain. The doses of gabapentin was escalated up to 2400 mg daily without significant side effects. Afterwards, the dose was gradually increased to 3600 mg daily and the patient experienced fatigue, mild headache and dizziness. These symptoms were initially interpreted as side effects of gabapentin. However, the tingling sensations in the fingers were almost disappeared. The doses of gabapentin was reduced, but without relief of symptoms. Within 2 weeks, the patient developed partial paresis of the right upper limb and aphasia. The patient was urgently referred to the neurologic inpatient clinic. CT- and MR-scans showed multiple cerebral metastases. Under the diagnostic workup the lung tumor was found. The biopsy showed pulmonary adenocarcinoma.

Conclusions: The symptoms of lung cancer with cerebral metastases can mimic side effects of gabapentin.

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