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Editorial comment

Multiple chemical sensitivity and persistent pain states are related, may be treated with similar procedures?

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In this issue of Scandinavian Journal of Pain, Marie Tran and colleagues [1] investigate whether pulsed electromagnetic fields (PEMF) is a feasible treatment for multiple chemical sensitivity (MCS). In an open case study, the authors found that two of the three MCS patients who participated in the study improved in terms of symptoms and functional impairment after an eight week PEMF treatment programme. Additionally, capsaicin-induced secondary punctate hyperalgesia seemed to decrease as an effect of the treatment. Based on these case reports, the authors suggest a randomized, placebo-controlled trial to evaluate the effect of PEMF on MCS.

1. MCS and its relationship to chronic pain

MCS sufferers get symptoms after being exposed to concentrations of everyday chemicals that by current knowledge should be safe. Someone who constantly gets dizzy and nauseous by a colleague's cigarette smell might fit the label. So could a person who is forced to quit his or her work as even the slightest odour exposure seems to cause debilitating symptoms. MCS is a medical unexplained symptom. There is no accepted diagnosis, no treatment, and practically no information that can be provided to practitioners or sufferers. Yet, MCS is surprisingly prevalent in society [2]. MCS is often dismissed as a modern, western expression of hypochondria. It does however have historical antecedents, and was originally seen as an aspect of allergy [3]. MCS can also be found in several non-western societies such as among the Khmers of Cambodia [4].

The overlap between MCS and chronic pain states is considerable, to a degree that suggests common underlying causes. Up to one half of MCS patients also report having fibromyalgia, and almost 40% of fibromyalgic patients report having MCS [5]. Some of the authors of the current study have also previously shown that MCS is associated with increased capsaicin-induced secondary punctate hyperalgesia [6]. A suggested common denominator of MCS and chronic pain states (or for that matter a number of similar medically unexplained symptoms) is sensitization of central nervous system neurons (CNS) [5].

2. Neural sensitization – a constrained hypothesis or basic scientific assumption?

Tran and colleagues base their study on the assumption of neural sensitization in MCS. Neural sensitization is, however, a both diffuse and broad concept, with several variations expressed in the literature. From an MCS perspective, neural sensitization is the name of a theoretical framework. Neural sensitization in this context is described both in terms of general response amplification and as an acquired state of disease [7]. Other definitions of sensitization involving the nervous system are more restrictive, such as the activity-dependent increase in excitability of nociceptive neurons in the dorsal horn [8]. The ambiguity of the sensitization concept has been discussed before [9]. Because of the many variations, it is often difficult to interpret what kind of neural sensitization researchers refer to. Is it a state of disease as proponents of the MCS theory sometimes seem to suggest [7], a local reaction of nerves in the spinal cord or even a fundamental process in the nervous system [10]?

To complicate matters further, symptoms stemming from the CNS are a hallmark of MCS, and a mandatory criterion in its clinical definition [11]. Arguing for neural sensitization can in this context be interpreted as a form of circular reasoning. The defining and obligatory CNS symptoms in MCS seem to automatically corroborate the neural sensitization hypothesis, regardless of whether the researcher refers to a state of illness or a fundamental process in the nervous system. Tran and colleagues conclude that the results are in accordance with the hypothesis of neural sensitization in MCS. Given its definition, is it possible to imagine a situation where neural sensitization is not an aspect of MCS? The main focus of the study is however treatment, not theory, which makes these arguments less important in the current context. For the field at large, these discussions are nevertheless necessary to disentangle the sometimes confusing and overlapping explanatory theories. Similar sentiments, but in the context of chronic pain states, can be gleaned from previous discussions in the editorial comments of this journal [12].

3. Pulsed electromagnetic fields – mostly beneficial, but with some caveats?

The three MCS cases were treated with PEMF therapy for 30 min each week-day for eight consecutive weeks. Two of the

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patients improved – in terms of symptoms but also in terms of capsaicin-induced hyperalgesia. The third was, however, diagnosed with depression four days before the end of the treatment. The authors assure the reader that the development of depression was associated with stressful life events, and not the intervention. Nevertheless, some of the uncommon side-effects of PEMS treatment reported by the authors, such as suicidal ideation, are associated with depression. Even though negative side-effects of PEMF treatments are reportedly uncommon, they must be taken seriously. As the treatment coincided with the suggested stressful life-events, there is a possibility, even if it is ever so slight, that the PEMF procedure aggravated the depressive symptoms. PEMF is still a relatively untested treatment, and side-effects should be taken seriously if the current case reports result in a larger study.

4. Promising results, no alternatives

The description of the three cases not only provides the reader with demographic information, but also constitutes three representative examples of the extremely confined lives of MCS sufferers. Working life, studies, social activities – essentially all aspects of modern society are inaccessible for individuals with MCS. The only way to alleviate MCS symptoms is currently by means of avoidance, which is a strategy that introduces as many problems as it solves. Tran and colleagues have provided a promising and seemingly safe intervention that alleviated the symptoms in two of the three study participants. The severe negative impact on the lives of the MCS sufferers must be taken into account when assessing possible negative side effects of a treatment. Even if it was the case that the PEMF procedure resulted in worse symptoms for some MCS sufferers, the lack of alternatives nevertheless calls for a continuation of the current treatment programme.

5. Possible implications for MCS and pain

The possibility of drawing general conclusions from case studies is limited. The study by Tran and colleagues constitutes a sound and proper pilot test for a larger scientific endeavour. The obvious implication of this study is therefore exactly what the authors state themselves – that the effect of PEMF in MCS needs to be investigated in a randomized, placebo-controlled trial.

However, on a more general level, the study could represent a future bridging of the gap between MCS and chronic pain states. The authors have, in this and in previous studies [6], confirmed what the considerable overlap between MCS and fibromyalgia suggests – that sensitivity to pain is associated with sensitivity to chemical exposure. Tran and colleagues now suggest that these two states can be treated with similar procedures.

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