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No, Mindfulness Meditation-Based Analgesia Is Not Mediated by Endogenous Opioids

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To the Editor

In a recent study, Sharon et al¹ examined whether mindfulness meditation-based analgesia is mediated by endogenous opioids. This line of investigation is of critical importance in delineating the analgesic mechanisms supporting mindfulness meditation. To their credit, the study authors employed a crossover, double-blinded design. They examined the effects of meditation across 15 experienced meditators in response to a very brief (10 seconds) noxious cold stimulus and intravenous administration of the opioid antagonist naloxone (0.01 mg/kg), placebo-saline, and “natural meditation” (no intravenous).

The authors concluded that meditation reduces pain through endogenous opioids.

However, the authors’ interpretations are likely invalid. For one, meditation during naloxone infusion produced a 13% reduction in pain (−0.8 visual analog scale [VAS]; $P = .1$) and 19% reduction in “unpleasantness” (−1.1 VAS; $P = .07$) ratings when compared with pain ratings derived rest. Therefore, meditation-induced analgesia was not “reversed” by naloxone as the authors postulated.¹ The placebo-saline + meditation group exhibited a similar, yet significant reduction in pain (−1.1 VAS; $P < .01$) and “unpleasantness” (1.4 VAS; $P < .01$), and “natural meditation” produced a significant decrease in pain (−1.9 VAS; $P < .001$) and “unpleasantness” (−2.4 VAS; $P < .001$).

Unfortunately, the authors did not directly test the significant interaction effect or significant difference in the change in pain/unpleasantness ratings between the meditation + naloxone and meditation + placebo-saline conditions. Examination of the study’s Figure 1 and pain rating residuals (ie, baseline – meditation) indicate a lack of significant difference between the meditation + naloxone and meditation + placebo-saline conditions. The authors merely compared pre- with postmeditation pain scores within and *not* between each of the 3 conditions. Furthermore, without a *true* control, the decrease in pain exhibited in all 3 conditions could be solely attributable to habituation, order effects, or desensitization. Thus, one begs the question, what’s the point of employing control conditions if they are not going to be used to directly test the primary manipulation? Another study limitation is the employment of a trivial dose of naloxone (0.01 mg/kg). This is the smallest known dosage in the literature and likely did not comprehensively antagonize opioid receptors.²

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Taken together, Sharon et al's study findings¹ support our³ and others'⁴ data in demonstrating that naloxone failed to reverse meditation-induced analgesia.

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