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Transcutaneous electrical nerve stimulation prevents visceral pain in mice

To the Editor:

We assessed transcutaneous electrical nerve stimulation (TENS) antinociceptive activity in visceral pain in an experimental murine model.

Sixty-four mice were divided into eight groups. Group I, received perezone, *ip* while Group II received only the vehicle. The 5 mg·kg⁻¹ dose was chosen based on the results obtained in a previous dose-response study to perezone. The number of abdominal constrictive responses (ACR) was registered immediately after its administration. TENS electrodes were placed on Group III without stimulation during 30 min; afterwards, the mice received perezone *ip*. Groups IV to VIII underwent TENS (by means of two electrodes in the mouse's abdominal wall at different frequencies (10, 20, 40, 80, and 160 Hz) during 30 min. Immediately after the stimulation period, these last groups received perezone *ip* and the number of ACR was recorded.

A stimulator [Acupoint 2000, Instituto Politécnico Nacional (IPN) Mexico City, Mexico] was used for the generation of the electric impulses of TENS, with fixed parameters for all groups (except for the stimulation frequency); the pulse amplitude was 150 J·sec⁻¹, the relaxation pattern 1.8 sec, and the contraction pattern four seconds. Outcomes were analyzed with the Kruskal Wallis test and a $P \leq 0.05$ was considered statistically significant.

Perezone induced ACR accompanied by behavioural and autonomic responses (defecation, urination and tachycardia). The average of ACR during the observation in Group I TENS was 6.75 contractions, while it was zero for Group II.

For mice from Group III that only underwent electrode placement without stimulation before receiving perezone, ACR averaged seven contractions. The mice from Groups IV, V, VI and VII that underwent TENS

FIGURE The influence of transcutaneous electrical stimulation on the abdominal constrictive response in eight groups of eight mice.

30 min with frequencies of 10, 20, 40, and 80 Hz before the administration of perezone presented significant inhibition of ACR ($P < 0.05$) of 83, 87, 92 and 74%, respectively. Finally, in Group VIII the inhibition of the nociceptive effect was of 20% ($P > 0.05$; Figure).

We conclude that a decrease in ACR induced by perezone can be observed when TENS is applied at low frequencies. Applied prior to nociception, TENS appears to be useful as a non-pharmacological resource for visceral pain management.

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