Individual differences in conditioning are associated with individual differences in placebo analgesia as assessed by perceptual and autonomic outcomes: A pilot study

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Introduction
Placebo analgesia is effective pain reduction evoked by an inert treatment and is mediated by at least two psychological factors: expectations for pain relief and classical conditioning (e.g., pairing an inert treatment with pain reduction). Yet, considerable inter-individual variability in placebo responses exists. The present study examined whether pain perception, pain-elicited skin conductance (P-SC), and pain-elicited heart rate acceleration (P-HR) were related to placebo analgesia. Pain and autonomic responses were measured after two cream applications: placebo group (expectation + conditioning, E + C) was told that the cream was a powerful painkiller (e.g., Lidocaine), and stimulus intensity was sparsely reduced after the 1st cream application. These data were collected as part of a pilot study on placebo analgesia and spinal nociceptive processing.

Objective
To study the relationship between individual differences in the placebo response and autonomic responses (i.e., heart rate, skin conductance).

Methods: Perceptual Pain Responses
Pain intensity ratings were following each stimulation using a computer-presented, verbally-oriented scale.

Results: Placebo Analgesia Effects
• There was a significant interaction. Pain was reduced in the E + C group suggesting a significant placebo response (p < .05). There was no significant reduction in pain ratings in the NH group.
• There was a marginally significant interaction, Pain-shocks-evoked skin conductance was reduced in the E + C group (p = .04). There was no significant reduction in skin conductance in the NH group.

Conclusions
• Pain-shock-evoked heart rate change was not significantly reduced at time or group (ps > .42), suggesting that HR is not affected by placebo.

Methods: Autonomic Responses

Data Analysis
• Linear mixed model ANOVAs in UGS 11.0 were used to evaluate Placebo Effects for Pain Perception, Pain-Evoked Skin Conductance, and Pain-Evoked Heart Rate Acceleration. Pearson’s zero order correlations were conducted for: Pain Reduction & Conditioning, P-SC Reduction & Conditioning, and Expectations of Pain Relief.

Results: Correlations
• Pain Conditioning associated with Pain Reduction (r = .46, p = .04)
• Skin Conductance Conditioning associated with Skin Conductance Reduction (r = .55, p < .01)
• Heart Rate Conditioning associated with Heart Rate Reduction (r = .47, p = .04)
• Skin Conductance Conditioning marginally associated with Heart Rate Reduction (r = .43, p = .06).

Conclusion
• Together, these findings indicate that individuals’ perceptual and autonomic responses to conditioning trials predict their expectation for pain relief and their placebo response.
• The identification of predictors of placebo responding could help tailor pain treatments and inform the design of subsequent placebo-controlled studies.

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