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Effects of far-infrared emitting ceramic materials in an animal model of chronic inflammatory pain

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The experiments were performed after protocol approval by the Ethics Committee of the University of Southern Santa Catarina. The animals (male swissmice) were subjected to an intraplantar injection of Freud's complete adjuvant (CFA, 20 μ l, 70%). For treatment a far-infrared emitting ceramic pad (80% BioCorn PVC - 20% ceramic materials - BioPowerTM) was placed inside the animals boxes. After 24 h exposure, mechanical and thermal hyperalgesia were assessed (Von Frey test and hot plate test). In addition, edema formation and the temperature of the right hind paws were evaluated with a micrometer and a digital thermometer respectively. Control animals were placed on a Sham Pad - consisting of 100% BioCorn PVC (without bioceramics) and underwent the same experimental protocol. The results demonstrate that CFA i.pl. injection induced mechanical hyperalgesia ($P < 0.001$) which was significantly reduced by acute exposure to the ceramic pad. Analgesia lasted for up to 2 hours with peak effect 30 min after treatment ($P < 0.001$ - maximum inhibition of $53 \pm 11\%$). Chronic treatment with the ceramic pad reduced mechanical hyperalgesia on all evaluation days and thermal hyperalgesia on days 1 and 3. In addition, the treatment significantly decreased paw temperature on days 1 and 3 day, $8 \pm 1\%$ ($P < 0.001$) and $5 \pm 1\%$ ($P < 0.05$) respectively, when compared with control group. Treatment with a far-infrared emitting ceramic pad reduced mechanical and thermal hyperalgesia of inflammatory origin as well as the decrease of paw temperature induced by CFA intraplantar injection in mice.

Biography

Daniel Fernandes Martins, PT, has completed his PhD in Neuroscience in 2012 at the Federal University of Santa Catarina (UFSC), Brazil with short-term period at the Hotchkiss Brain Institute, AB, CA. Currently is a professor of the Postgraduation Program in Health Sciences of the University of Southern Santa Catarina (UNISUL), Brazil. His major research interests include the effect of physical therapies on pain and inflammation. He has published more than 30 papers in international scientific journals and has been serving as a referee to some respected journals in his field of expertise.

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