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Acute effect of different concentrations of cayenne pepper cataplasm on sensory-motor functions and serum levels of inflammation-related biomarkers in healthy subjects

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Abstract

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Physical medicine therapies are often used in treating widespread musculoskeletal disorders, such as neck and low back pain. Herbal cataplasms containing rubefacient substances, such as Cayenne pepper, or galenic preparations like Munari cataplasm are commonly used as natural medications to treat painful areas. In this paper we show the effects of a 20-min application of Cayenne pepper and kaolin powder cataplasm (CPC) on healthy subjects. Treatment effects were evaluated by cold/hot feeling on visual analogue scale, blood pressure, body temperature, skin light touch sensations, two-point discrimination, and pain threshold to a mechanical stimulus, before and immediately after, 15 min after and 30 min after different concentration of Cayenne pepper in CPC preparation on healthy subjects. Maximal voluntary trunk extension force and trunk extension submaximal force matching error were also measured. In addition, the resulting optimal CPC mixture was tested for its safety by measuring changes in circulating levels of inflammatory-related biomarkers after 20-min application. The results indicate that the 5% concentration of Cayenne pepper in the preparation of CPC is the best choice, since no additional effects can be obtained with the 10% concentration, and the effects are higher than those observed at the 2.5% concentration. Importantly, 5% CPC application did not induce a significant increase of inflammatory-related biomarkers, suggesting that 20-min application has no negative side effects at systemic levels. Further studies are needed to investigate the immediate and long-term effects of repeated CPC applications as well as to understand the intersecting underlying mechanisms activated by Capsaicin and other identified factors, in order to be more extensively used in the field of physical medicine therapies.

Key Words: Capsicum, capsaicin, TRPV1 receptor, physical therapy modalities, pain, sensation, inflammation, IL-6