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Original Article

Pain Relief with Wet Cupping Therapy in Rats is Mediated by Heat Shock Protein 70 and ß-Endorphin

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Abstract

Background: Wet cupping therapy is a complementary therapy in pain management. The mechanism of this therapy, however, needs further elucidation. Cells injured by wet cupping therapy seem to stimulate the expression of heat shock protein 70 (HSP70). Its benefit in pain reduction could be mediated by the expression of ß-endorphin. This study aimed at determining the correlation between HSP70 and ß-endorphin after wet cupping therapy.

Methods: Sixteen male Wistar rats were divided into control (CG; n=8) and treatment (TG; n=8) groups. The rats in both groups were injected with complete Freund's adjuvant (CFA) at the footpad. In the TG, wet cupping therapy was done at the left and right paralumbar regions 48 hours after the CFA injection. Twenty-four hours after therapy, the hot plate test was done to assess pain threshold. Thereafter, immunohistochemistry from the skin subjected to wet cupping therapy was conducted for HSP70 and ß-endorphin.

Results: The expression of HSP70 was significantly higher in the keratinocytes of the TG (20.25±3.53; P<0.001) than in the keratinocytes of the CG (10.50±2.44; P<0.001). The expression of ß-endorphin was significantly higher in the keratinocytes of the TG (22.37±3.52; P<0.001) than in the keratinocytes of the CG (5.12±1.72; P<0.001). The results also revealed a high correlation between HSP70 and ß-endorphin (β=0.864; P<0.001). Pain threshold after wet cupping therapy was significantly higher in the TG (22.81±6.34 s; P=0.003) than in the CG (11.78±3.56 s).

Conclusions: The benefit of wet cupping therapy in terms of pain reduction in rats could be mediated by the expression of HSP70 and ß-endorphin.

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Keywords ● Pain ● Rat ● HSP70 heat-shock proteins ● ß-endorphin ● Complementary therapies

What's Known

- Wet-cupping therapy is a complementary and alternative therapy. Many studies have shown that cupping therapy can relieve pains such as headache, low back pain, brachialgia paraesthetica nocturna, carpal tunnel syndrome, and cervicalgia. The mechanism is still unclear.

What's New

- In an animal model of pain, wet-cupping therapy reduced pain. This study showed that wet-cupping therapy expressed heat shock protein 70 and β-endorphin. We conclude that the mechanism of wet-cupping therapy in reducing pain was mediated by heat shock protein 70 and ß-endorphin.

Introduction

Pain prevalence ranges from 8% to over 60% worldwide and as such constitutes a major clinical, social, and economic problem.[1,2] Chronic pain reduces health-related quality of life[3] by creating disturbances in sleep, sexual activity, social activity, and work.[4,5]