World Academy of Science, Engineering and Technology
International Journal of Medical and Health Sciences
Vol:13, No:03, 2019

Acupoint Injection of High Concentration of Glucose Attenuates Mice Chronic Pain and Depression Comorbidity

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Abstract : Inflammation causes changes of peripheral and central nervous system properties, affecting both neuronal and non-neuronal cells, resulting in inflammatory pain. Acupoint injection (AI) was developed in the 1950s and has been widely used for relieving pain. It is an acupoint-stimulating technique that utilizes anatomically based meridians derived from Chinese medicine theory. AI has been accepted as an effective treatment and is thought to display superior results when compared to traditional acupuncture methods. However, the mechanism of AI needs to be ratified by more scientific evidence in order to support the theory and its therapeutic development. In this study, we explored the effect of AI on the comorbidity of chronic pain and depression. Mice hindpaw was injected by complete Freund's adjuvant (CFA) to induce the condition of chronic pain. Measurements of mechanical and thermal hyperalgesia and depression-like behavior were analyzed. The results indicated a positive tendency to AI treatment. The comorbidity of chronic pain and depression was investigated with relation to transient receptor potential V1 (TRPV1) mechanism through the use of TRPV1 gene deletion. The expression of nociceptors such as voltage-gated sodium channels (Navs) or TRPV1, was significantly down-regulated by AI. The expression of inflammation-activated molecules: astrocytic marker glial fibrillary acidic protein (GFAP), the microglial marker Iba-1, S100B, and related kinases, were reversed by AI in both the peripheral and central nervous system. Taken together, these data provided a detailed molecular mechanism of AI-induced analgesia and anti-inflammatory properties. This finding may be utilized for clinical practice to treat chronic pain and depression comorbidity.

Keywords : inflammatory pain, acupoint injection, TRPV1, GFAP, S100B
Conference Title : ICPBMD 2019 : International Conference on Psychiatry, Behavioral and Mental Disorders
Conference Location : Tokyo, Japan
Conference Dates : March 25-26, 2019