

The Analgesic Effect of Electroacupuncture in a Murine Fibromyalgia Model

Authors : Bernice Jeanne Lottering, Yi-Wen Lin

Abstract : Introduction: Chronic pain has a definitive lack of objective parameters in the measurement and treatment efficacy of diseases such as Fibromyalgia (FM). Persistent widespread pain and generalized tenderness are the characteristic symptoms affecting a large majority of the global population, particularly females. This disease has indicated a refractory tendency to conventional treatment ventures, largely resultant from a lack of etiological and pathogenic understanding of the disease development. Emerging evidence indicates that the central nervous system (CNS) plays a critical role in the amplification of pain signals and the neurotransmitters associated therewith. Various stimuli have been found to activate the channels existent on nociceptor terminals, thereby actuating nociceptive impulses along the pain pathways. The transient receptor potential vanilloid 1 (TRPV1) channel functions as a molecular integrator for numerous sensory inputs, such as nociception, and was explored in the current study. Current intervention approaches face a multitude challenges, ranging from effective therapeutic interventions to the limitation of pathognomonic criteria resultant from incomplete understanding and partial evidence on the mechanisms of action of FM. It remains unclear whether electroacupuncture (EA) plays an integral role in the functioning of the TRPV1 pathway, and whether or not it can reduce the chronic pain induced by FM. Aims: The aim of this study was to explore the mechanisms underlying the activation and modulation of the TRPV1 channel pathway in a cold stress model of FM applied to a murine model. Furthermore, the effect of EA in the treatment of mechanical and thermal pain, as expressed in FM was also to be investigated. Methods: 18 C57BL/6 wild type and 6 TRPV1 knockout (KO) mice, aged 8-12 weeks, were exposed to an intermittent cold stress-induced fibromyalgia-like pain model, with or without EA treatment at ZusanLi ST36 (2Hz/20min) on day 3 to 5. Von Frey and Hargreaves behaviour tests were implemented in order to analyze the mechanical and thermal pain thresholds on day 0, 3 and 5 in control group (C), FM group (FM), FM mice with EA treated group (FM + EA) and FM in KO group. Results: An increase in mechanical and thermal hyperalgesia was observed in the FM, EA and KO groups when compared to the control group. This initial increase was reduced in the EA group, which directs focus at the treatment efficacy of EA in nociceptive sensitization, and the analgesic effect EA has attenuating FM associated pain. Discussion: An increase in the nociceptive sensitization was observed through higher withdrawal thresholds in the von Frey mechanical test and the Hargreaves thermal test. TRPV1 function in mice has been scientifically associated with these nociceptive conduits, and the increased behaviour test results suggest that TRPV1 upregulation is central to the FM induced hyperalgesia. This data was supported by the decrease in sensitivity observed in results of the TRPV1 KO group. Moreover, the treatment of EA showed a decrease in this FM induced nociceptive sensitization, suggesting TRPV1 upregulation and overexpression can be attenuated by EA at bilateral ST36. This evidence compellingly implies that the analgesic effect of EA is associated with TRPV1 downregulation.

Keywords : fibromyalgia, electroacupuncture, TRPV1, nociception

Conference Title : ICAHA 2018 : International Conference on Alternative Healthcare and Acupuncture

Conference Location : Osaka, Japan

Conference Dates : March 29-30, 2018