

## On the mechanisms of physiological activities produced by various sham interventions used in recent clinical trials of acupuncture



Kenji Kawakita, Maria Carneiro and Kaoru Okada

Department of Physiology  
Meiji University of Integrative Medicine  
Kyoto, Japan

Recent RCTs of acupuncture have clearly demonstrated the clinical usefulness of real acupuncture, but no significant difference between real and sham acupuncture. These results tended to lead denying the specific effect of acupuncture based on an assumption of physiological inertness of sham acupuncture. If the sham interventions had any physiological activities, it is more adequate to conclude the lack of statistically significant difference between two types of acupuncture interventions. In this brief review, we introduce several pieces of evidence of physiological activities produced by sham interventions.

In micro-neurogram study on human peripheral nerve, afferent discharges elicited by real acupuncture and various sham interventions were examined. Unmyelinated mechano-heat (CMH) units and myelinated mechano-sensitive (AM) units were well responsive to both real acupuncture and sham interventions (minimal acupuncture, non-insertion needling and guide tube tapping). Only sham press tack needling (PTN) rarely induced excitatory response on the CMH units. Neuronal responses of various nuclei which closely related to pain transmission and endogenous pain inhibitory system were recorded in anesthetized rats. The majority of wide dynamic range (WDR) neurons were also responsive to both real and sham interventions, and both excitatory and inhibitory responses were reported.

CMH units were assumed as polymodal receptor units, and they were considered as the major inputs to endogenous pain inhibitory system and other regulatory systems. The facts that various sham interventions could activate the CMH units clearly deny the assumption of physiological inertness of sham interventions. Sham interventions could activate the AM units which also induce analgesic effects mediated by gate-control mechanism, and also have potential to produce pleasantness through C low threshold mechano-sensitive afferents. Modulatory effects of touch stimulation on the autonomic nervous system have also clarified. These lines of evidence clearly require re-consideration of the assumption of physiological inertness of sham acupuncture interventions.

Keywords: microneurogram, sham acupuncture, specific effect of acupuncture, polymodal receptor, WDR neurons, endogenous pain inhibitory systems