

**ABSTRACT**

**THE EFFECTS OF L AND N CALCIUM CHANNEL BLOCKER  
IN ACUPUNCTURE ANALGESIA**

(Experimental Study on *Rattus norvegicus*)

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Acupuncture has been proven to produce analgesia. This acupuncture analgesia has further been proven to be elicited through two pathways, namely the vascular pathway and neurologic pathway. This true experimental controlled study on 56 *Rattus norvegicus* randomized into 7 groups explored the established mechanisms and tried to find the possibility of the third pathway in conjunction with the classic acupuncture "meridian" theory. The groups were control group, acupuncture group, naloxone plus acupuncture group. Verapamil plus acupuncture group, omega conotoxin GVIA (low, medium and high dose) plus acupuncture group. Verapamil as specific L-Calcium channel blocker and omega conotoxin GVIA as specific N-Calcium channel blocker were used to specifically inhibit known acupuncture pathways. The standardized pain stimulus chosen was exposure to hot plate of 50°C and subjects were observed for response time of claw-licking, standing and jumping. The results show as follow:

Blocking the effect of endorphine released by acupuncture with naloxone significantly abolished acupuncture analgesia back to non-acupuncture level.

Blocking the vascular pathway with verapamil showed shorter response time and lower beta-endorphine level than acupuncture group.

Blocking the neurologic pathway with omega conotoxin GVIA reduced but not abolished acupuncture analgesia as shown by shorter response time and higher beta-endorphine level as acupuncture group.

These residual acupuncture analgesia proved the existence of the third pathway other than known vascular and neurologic pathways. This may support the living matrix theory which appears to be a continuum pathway throughout the body.

**Keywords** ; acupuncture analgesia, naloxone, verapamil, omega conotoxin, living matrix.