

ACUPUNCTURE AS A TREATMENT IN SMALL ANIMALS PAIN



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Objectives

Understand the physiological mechanisms by which acupuncture can manage to reduce pain in small animals. Also define or establish the degree of scientific evidence, according to the grade system, of the usefulness of acupuncture in pain therapy.

Pain mechanism



Figure III. Graphical summary of the 3 steps of neural processing (Dolor: Tipos y Vias, 2022).

1. **Transduction**: Process by which noxious stimuli are converted into electrical signals in nociceptors, action potentials are generated that propagate towards the center, towards the body of the first-order neuron.

2. **Transmission**: The information is transmitted through three primary afferent nociceptive neurons: the C, A δ and A β fibers. In the dorsal horn of the spinal cord messages are transmitted through the release of neurotransmitters. These pain neurotransmitters activate the second-order neuron, which is one that receives nociceptive stimulus and, this action potential, crosses the spinal cord to the contralateral side and ascends to the spinothalamic fascicle, until it reaches the thalamus where it synapses with the third-order neuron, which starts from the medial area of the ventrobasally complex of the thalamus and ends in the cerebral cortex, called the pain matrix, which allows the perception of pain.

3. **Modulation**: changes that occur in the nervous system in response to a noxious stimulus.

Acupuncture mechanism

Once the acupuncture points are stimulated, fast signals transmitted by the A β fibers are produced, this stimulus is conducted to the dorsal horn of the spinal cord. The painful stimulus is conducted by the A δ and C fibers, which are slower fibers, when it reaches the dorsal horn of the spinal cord it is blocked and its transmission to the brain does not occur.

Local effects in acupuncture include increased blood flow and decreased pain. When mast cells are mechanically stimulated, they degranulate and release different types of mediator substances that help reduce pain.

Conclusions

The analgesic action of acupuncture in the periphery depends on the activation of A β fibers, these are fast and inhibit the painful stimulus that is carried by slower A δ and C fibers, preventing the signal from reaching the brain.

The analgesic action of acupuncture at a local level depends on the release of pain neurotransmitters, these are released thanks to the degranulation of mast cells, due to the mechanical stimulation with the needle.

Referring to the GRADE system and the review of various articles published to date, we could say that the analgesic effect of acupuncture has a low level of scientific evidence.

| Table 1. The 4 levels of GRADE system | |
|---------------------------------------|--|
| Quality levels | Definition |
| High | Randomized clinical trial. High confidence between the actual and the estimated effect. |
| Moderate | Moderate confidence in the estimate of the effect. There is a possibility that the actual effect is far from the estimated effect. |
| Low | Observational studies. Limited confidence in the effect estimate. The effect may be far from the estimate. |
| Very low | Little confidence in the estimated effect. The true effect is most likely different from the estimate. Any estimate of the effect is very uncertain. |

Bibliography

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