Auricular Acupuncture Leads to Recovery Following Intra-Operative Stroke

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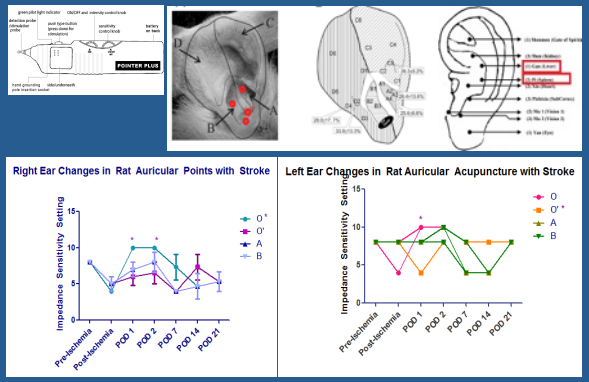
Introduction:

- While the mechanism of action is still unclear, in the United States, acupuncture has been most commonly studied for the treatment of pain-related disorders.[1]
- A recent Cochrane review concluded that, while biological effects of acupuncture are promising, there is currently no clear evidence for the use of acupuncture in stroke rehabilitation.[2]
- Auricular acupuncture (AA) differs from traditional acupuncture in that it focuses primarily on the ear, and therefore may have a different mechanism of action and different effects from traditional body acupuncture.
- One proposed mechanism for its protective effects in the central nervous system is through inflammatory factor modulation.[3]
- We examined AA, a cost-effective and easy to use modality, for anti-inflammatory properties and treatment of ischemic stroke injury in adult rats.

Low impedance points identified post-stroke

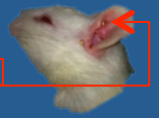


Using a point-finder, four low impedance points were identified that corresponded to points used for stroke in the human ear. Of these points, the most significant changes in impedance occurred in a point identified as O' (n=4, p<0.05).

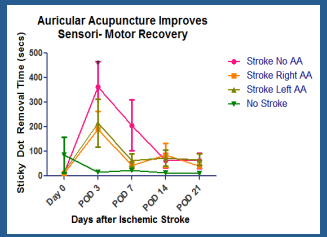
Methods:

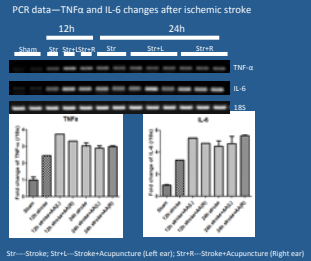
- Adult male Wistar rats were anesthetized with isoflurane anesthesia and underwent right middle cerebral artery occlusion (R-MCAO) for one hour.
- Rats were treated immediately post-operatively with either:
  - AA at four low impedance points on the ipsilateral right ear (n=6)
  - AA at four low impedance points on the contralateral left ear (n=6)
  - no AA (n=6).
- Another control group not exposed to stroke nor AA was added (n=4).
- Rats underwent adhesive removal testing to evaluate recovery of sensori-motor function at post-operative days (POD) 3, 7, 14, and 21.
- PCR was used for detecting markers of inflammation.
- Quantification was performed by a blinded investigator.

Gold ASP cem: permanent needle; inserted at 4 AA points



Auricular Acupuncture improves sensori-motor recovery and modulates TNFα and IL-6





Str—Stroke; Str+L—Stroke+Acupuncture (Left ear); Str+R—Stroke+Acupuncture (Right ear)

A) Ischemic stroke under isoflurane anesthesia caused a significant decrease in sensori-motor function as measured by sticky-dot testing three days post-operatively ($P < 0.001$; n=22). This effect was attenuated by AA in either the ipsilateral or contra-lateral ear. A significant improvement in sticky dot removal occurred when AA was performed ipsilateral to the stroke ($P < 0.05$; n=22). During the recovery phase there was no significant difference between any of the groups after POD 3. B) AA resulted in an increase in TNF-α and IL-6 at 12 hours post-stroke, but this difference was not statistically significant.

Conclusions:

- AA appears to improve sensori-motor recovery following intra-operative ischemic injury.
- Sidedness may be a factor, with AA, with AA ipsilateral to the stroke leading to more significant improvements.
- AA results in increased TNFα and IL-6 expression 12 hours post-stroke, which may lead to neuroprotection via diminished free radical expression, increased angiogenesis, and decreased excitotxicity.[4-6]
- Although modulation of inflammatory factors is present at 12 hours post-stroke, this difference disappears at 24 hours post-stroke, suggesting the need for early AA to lead to earlier recovery.
- Further research should involve higher sample sizes, and a more detailed investigation regarding the mechanisms of AA-induced neuroprotection.
- AA, a cheap and easy to use acupuncture modality, could improve recovery following intra-operative ischemia, leading to decreased length of hospital stay and earlier return of neurologic function.

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