



## Study on nitric oxide and monoamines participated in effects of electroacupuncture on anti stress gastric ulcer in rats

Shun-Li Zhu, Guan-Xun Xu, Quan-Zhu Chen, Zhen-Jiu Wang, Jie Jiao

Shun-Li Zhu, Guan-Xun Xu, Quan-Zhu Chen, Zhen-Jiu Wang, Jie Jiao, Institute of Acupuncture and Meridians Anhui College of TCM, Hefei, Anhui Province, China

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### Abstract

**AIM:** This paper analyzed contents of NO, activities of NOS, contents of monoamine transmitters in stress gastric ulcer rats on electroacupuncture Zusanli point (ST 36).

**METHODS:** The stress gastric ulcer in rats was made by "restraint cold" method. The rats were divided into 4 groups: stress group, electro acupuncture after stress group, stress after electroacupuncture group and control group. The biochemical induced of NO and monoamine transmitters were assayed with 752 model ultraviolet spectrophotometer and MPF-4 model fluorescence spectrophotometer respectively.

**RESULTS:** (1) The NO and NOS in stress gastric ulcer rats were obviously decreased, compared with control group,  $P < 0.01$ . The monoamines also changed: 5-HT contents in gastric antral mucosa and serum increased ( $P < 0.01$  and  $P < 0.05$ ) respectively. The DA decreased,  $P < 0.05$ . (2) Compared with stress group, NO and NOS

contents of the stress after electro acupuncture group recovered significantly ( $P < 0.05$  and  $P < 0.01$ ), respectively. Monoamines (DA, NE, 5-HT and 5-HIAA) content in antrum mucosa changed and showed double direction regulation, *i.e.* the formerly decreased monoamine content increased, while former increased monoamine content decreased. Compared with stress group, 5-HIAA content of the electro-acupuncture after stress group decreased,  $P < 0.05$ . DA content increased,  $P < 0.01$ . NE content increased,  $P = 0.05$ . (3) Serum 5-HT and DA contents continually increased or decreased after electro acupuncture, compared with stress group, serum NE did not change obviously.

**CONCLUSION:** The results confirmed that NO was strongly related to monoamine transmitters during the gastric mucosa damage by "restraint cold". It indicated that electro acupuncture had protection effect for gastric mucosa in stress gastric ulcer rats. NO and monoamines involved in effects of electro-acupuncture. It indicated that the protecting effect of electro acupuncture on gastric mucosa was exerted by the double regulation of the monoamines, influencing the DA, NE and 5-HT contents, and NO relaxing blood vessel, regulating mucosa blood flow, thus maintaining mucosa intact, and strengthening the mucosal defensive function.

**Key words:** Nitric oxide; Monoamines; Electro acupuncture

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