Mechanism of aquaporin 4 (AQP 4) up-regulation in rat cerebral edema under hypobaric hypoxia and the preventative effect of puerarin

Chi Wang, Muyang Yan, Hui Jiang, Qi Wang, Shang He, Jingwen Chen, Chengbin Wang

PII: S0024-3205(17)30537-4
DOI: doi:10.1016/j.lfs.2017.10.021
Reference: LFS 15390

To appear in: *Life Sciences*

Received date: 23 August 2017
Revised date: 8 October 2017
Accepted date: 17 October 2017

Please cite this article as: Chi Wang, Muyang Yan, Hui Jiang, Qi Wang, Shang He, Jingwen Chen, Chengbin Wang , Mechanism of aquaporin 4 (AQP 4) up-regulation in rat cerebral edema under hypobaric hypoxia and the preventative effect of puerarin. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Lfs(2017), doi:10.1016/j.lfs.2017.10.021

Title page

Title:

Mechanism of aquaporin 4 (AQP 4) up-regulation in rat cerebral edema under hypobaric hypoxia and the preventative effect of puerarin

Authors and affiliations:

Chi Wang1, Muyang Yan2, Hui Jiang2, Qi Wang3, Shang He1, Jingwen Chen2, Chengbin Wang1#

1 Department of Clinical Laboratory, PLA General Hospital, 100853, Beijing

2 Department of Hyperbaric Chamber, PLA General Hospital, 100853, Beijing

3 Outpatient Department of Chinese People's Liberation Army Aviation School, 101023, Beijing

 # Corresponding author:

Chengbin Wang

E-mail: wangcb301301@163.com,

Phone number: +86-18911764209

Present address: 28, Fuxing Road, Haidian District, Beijing, China

Abstract

Aim

We aim to investigate the mechanism of aquaporin 4 (AQP 4) up-regulation during high-altitude cerebral edema (HACE) in rats under hypobaric hypoxia and preventative effect of puerarin.

Methods

Rats were exposed to a hypobaric chamber with or without the preventative treatment of puerarin or dexamethasone. Morriz water maze was used to evaluate the spatial memory injury. HE staining and W/D ratio were used to evaluate edema injury. Rat astrocytes and microglia were co-cultured under the condition of hypoxia with the administration of p38 inhibitor, NF-κB inhibitor or puerarin. Interleukin 6 (IL-6) and tumor necrosis factor α (TNF α) of cortex and culture supernatant were measured with ELISA. AQP4, phosphorylation of MAPKs, NF-κB pathway of cortex and astrocytes were measured by Western blot.

Key findings

Weakened spatial memory and cerebral edema were observed after hypobaric hypoxia