

## Effects of acetylcholine precursors on inflammation markers in rat brain

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Choline is involved in important neurochemical processes. It is a precursor and metabolite of acetylcholine and plays a pivotal role in single-carbon metabolism and it is a fundamental constituent of membrane phospholipids such as phosphatidylcholine.

The role of choline and its precursors (e.g. choline alphoscerate, GPC) was recently investigated in experimental endotoxic shock. The obtained results suggest that these molecules may be useful in the treatment of endotoxemia/sepsis. On the other hand, a neuroprotective effect of choline precursors is well-documented and these actions may be related to their activity on inflammatory processes.

Based on these findings, the present study was designed to evaluate the effects of choline and GPC in inflammatory processes modulation in the rat brain.

Male Wistar rats were treated orally with choline, and GPC at choline-equivalent doses for 2 weeks or were left untreated. After this period, the brains were processed for Western blot analysis and immunohistochemistry. Inflammatory cytokines (IL1 $\alpha$ , IL6, and TNF $\alpha$ ) and endothelial inflammatory markers (ICAM-1, and VCAM-1) were studied in different cerebral areas (frontal cortex, hippocampus and cerebellum).

Treatment with choline or GPC has not influenced the expression of the inflammatory markers investigated in the brain areas examined. Hence, in this non-pathologic model, GPC, in spite of its neuroprotective effects [1,2], probably does not change or modulate brain inflammatory processes.

### References

- [1] Tayebati et al. (2009) Neuroprotective effect of treatment with galantamine and choline alphoscerate on brain microanatomy in spontaneously hypertensive rats. *J Neurol Sci.* 2009 283: 187-194.
- [2] Tayebati et al. (2015) Cerebrovascular and blood-brain barrier morphology in spontaneously hypertensive rats: effect of treatment with choline alphoscerate. *CNS Neurol Disord Drug Targets.* 14: 421-429.

### Keywords

Choline, choline precursors, immunochemistry, immunohistochemistry, brain areas, inflammation