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Proinflammatory cytokines in the embolic model of cerebral ischemia in rat

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Introduction: Increased levels of proinflammatory cytokines have been recorded after the onset of transient or permanent brain ischemia and are usually associated with exacerbation of ischemic injury. Embolic stroke model is more relevant to the pathophysiological situation in such patients, because the majority of ischemic injuries in humans are induced by old thrombi that originate from the heart and carotid arteries. Therefore, the aim of the present study was to investigate changes of inflammatory cytokines after embolic stroke.

Material and methods: Rats were subjected to embolic stroke, induced by a natural old clot which was injected in Middle Cerebral Artery (MCA), or sham stroke, which the same volume of saline was injected into the MCA. At 48 h after stroke induction, the levels of 5 cytokines (IL-1 α and β , IL-6, IFN- γ and TNF- α) were determined in 500 μ g of total protein using the Bio-Plex RatCytokine Array (BioRad), according to the manufacturer's instructions in ischemic and nonischemic cortices.

Results: While stroke animals showed infarctions and neurological deficits, we did not observe any cerebral infarction and neurological deficits in sham-operated animals. The levels of IL-1+ ($p=0.000$) and -, ($p=0.004$), IL-6 ($p=0.008$), TNF+ ($p=0.000$) and IFN-0 ($p=0.044$) were significantly increased compared to sham treated animals.

Conclusion: The findings of the present study suggest that part of ischemic injury in the embolic stroke may be mediated through the increased levels of inflammatory cytokines.

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