BRAIN PROSTANOIDS PROFILE IN CONTROL AND LPS-TREATED RATS

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Brain prostanoids levels play both physiological and pathological role in the brain and their measurement represents a useful biomarker. In fact, they can modulate synaptic transmission and remodeling, neurotransmitter release, hypothalamic-pituitary-adrenal axis, sleep/wake cycle, and appetite. Prostanoids have been linked also to pathological processes in the CNS, including neurodegenerative disorders such as Alzheimer's disease, amyotrophic lateral sclerosis, and psychiatric disorders such as schizophrenia and mood disorders (1). However, available methods for prostanoids extraction and dosage are often difficult to perform and time consuming. Aim of the present study was the set up of a simple experimental method useful to determine rat brain prostanoid profile. A series of experiments were first performed in order to establish optimal conditions (i.e.: fresh/frozen tissues, extraction medium, column purification). Then, a simple method was set up using frozen tissue as starting material, performing extraction in aqueous buffer, skipping organic extraction and column purification, and measuring all prostanoids by EIA assay. In order to verify if prostanoid production differences could be evaluated using this method, a model of LPS-induced fever was utilized. Rats (Wistar adult male 200-225g) were treated (10ml/kg body weight) with LPS (50µg/kg i.p.) or saline and sacrificed 5 hr after injection to collect brain samples. A minimum of 5 rats per group were used. Experiments were performed starting at 9:30 AM (time 0) to take account of circadian variation. Body temperature was measured by a thermistor rectal probe and temperature at time 0 was used to assemble homogeneous groups. One way analysis of variance followed by Dunnett's test was performed. Body temperature measurement just before sacrifice revealed a significant difference in LPS-treated rats compared to saline (38.2±0.09°C vs. 37.6±0.10°C, $p<0.05$). Prostanoid quantification was performed for PGE_2, $PGF_{2\alpha}$, PGD_2, PGI_2, TXA_2. Among them, analysis of brain levels showed a significant ($p<0.05$) difference only for PGE_2 (6.7±0.67 ng/g in saline control vs. 9.4±0.79 ng/g in LPS-treated rats).
Results obtained confirmed the robustness of the method used and suggest that it could represent a useful tool to evaluate the correlation between prostanoid levels and *in vivo* parameters (such as body temperature changes and/or drug effects).

(1) Choi SH, Langenbach R and Bosetti F. (2006) J Neurochem.: 801-11.