

ADENOSINE AND DOPAMINE AS NEUROMODULATORS IN HYPOXIC HYPOTHERMIA IN CONSCIOUS RATS

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Adenosine has a depressant effect on neurons and its endogenous cerebral interstitial concentration increases with hypoxia. Dopamine also accumulates in the Nucleus Tractus Solitarius in response to peripheral chemoreceptor stimulation. No reports are available about the role of central adenosine and dopamine in the thermoregulatory and metabolic responses to hypoxia in conscious rats. Thus, we measured Tb by biotelemetry and oxygen consumption (V_{O_2}) by closed respirometry of Wistar rats before and after intracerebroventricular injection of adenosine antagonist, aminophylline (40 μ g/1 μ l), or its vehicle (saline) and dopamine antagonist, haloperidol (0.5 μ g/1 μ l), or its vehicle (DMSO 5%) followed by a 30 min period of hypoxia exposure (7% O_2). Both saline and DMSO 5% solution had no effect on Tb or V_{O_2} before and after hypoxic exposure. Neither aminophylline nor haloperidol changed Tb and V_{O_2} of rats during normoxia; however, during hypoxia both treatments significantly attenuated ($P < 0.05$) hypoxic hypothermia and hypometabolism. In conclusion, this study indicates that central adenosine and dopamine seems to be neuromodulators involved in the hypoxic hypothermia. However, because aminophylline and haloperidol did not abolished the hypothermic response the study also suggests that action of several neuromodulators may be necessary to trigger a full-blown hypoxic hypothermia.

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