

SHORT COMMUNICATION

PROLONGED TREATMENT WITH GLUCOCORTICOID DEXAMETHASONE SUPPRESSES MELATONIN PRODUCTION BY THE CHICK PINEAL GLAND AND RETINA

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Prolonged treatment with glucocorticoid dexamethasone suppresses melatonin production by the chick pineal gland and retina. J.B. ZAWILSKA, M. SADOWSKA. Pol. J. Pharmacol., 2002, 54, 61–66.

The chick pineal gland and retina synthesize melatonin in a circadian rhythm with high levels during the night. The rhythmic changes in the hormone production result predominantly from the fluctuation in the activity of serotonin N-acetyltransferase (AA-NAT), a penultimate and key regulatory enzyme in melatonin biosynthesis. The aim of this study was to analyze the effects of an acute and prolonged *in vivo* treatment with a glucocorticoid dexamethasone (4 mg/kg, *ip*) on the nocturnal increase in AA-NAT activity in chick pineal gland and retina. In acute experiments, dexamethasone (single dose)-injected chicks were killed after 2 h, while in prolonged experiments the glucocorticoid was given once daily for 7 days and the animals were killed 26–32 h after the last injection. Acute administration of dexamethasone did not affect AA-NAT activity in the chick pineal gland and retina. In the pineal glands and retinas of chicks that were treated with dexamethasone for one week and then killed at the end of the light phase of the 12:12 h light-dark cycle, AA-NAT activity was significantly higher than the enzyme activity found in tissues isolated from the vehicle-treated (control) animals. In addition to that, the nocturnal increase in pineal and, to a lower extent, retinal AA-NAT activity was significantly lower in dexamethasone-treated birds when compared with the respective control groups. It is suggested that prolonged treatment of animals with dexamethasone reduces the amplitude of the rhythmic melatonin production, a phenomenon which may affect chronobiological processes being under control of this hormone.

Key words: dexamethasone, serotonin N-acetyltransferase, hydroxyindole-O-methyltransferase, melatonin, pineal gland, retina, chick

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