Continuous light reverts physical exercise effects on colon carcinogenesis induced by 1,2-dimethyl-hydrazine in rats. #74

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Colon cancer risk is reduced by appropriate levels of physical exercise. Light exposure during the night conveys endocrine changes on melatonin rhythm produced by pineal gland. This hormone is considered as a potent anti-oxidant with oncostatic properties. Both factors are related to colon cancer, which risk can be estimated by the evaluation of pre-malignant factors of colonic mucosa such as the Aberrant Crypt Foci (ACF). This study aims to verify whether the beneficial effects of physical exercise are related to the activity of the pineal gland. Thus, 40 rats were divided into 5 groups: G0, G1 and G2 were sedentary, G3 and G4 were submitted to a protocol of progressive swimming exercise for 10 weeks. All groups, except G0, received 4 injections of the carcinogen 1,2-dimethyl-hydrazine (DMH), 40mg/kg, in the first 2 weeks. At the end of protocol, samples were collected from liver and colon for analysis. Statistical analysis was performed by Anova test, followed by Tukey's *post hoc* ($p<0.05$). As a result, it was found that continuous light (G2 and G3) increased the formation of ACF ($p<0.001$). Furthermore, continuous light exposure abolished the beneficial effects of physical exercise on ACF formation (G3>G4), $p<0.001$. However, the hepatic levels of oxidative stress enzymes, showed no statistical difference ($p>0.05$) among the experimental groups. This study emphasizes the suppressive effects of melatonin in early markers of colonic carcinogenesis and shows for the first time that the benefits of exercise may be reverted by a reduced activity of the pineal gland.

Key words: colon cancer; colonic mucosa; physical activity; continuous light.