Effects of risperidone on energy balance in female C57BL/6J mice.

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Abstract

OBJECTIVE: To investigate the effect of risperidone on energy expenditure and weight gain in female C57BL/6J mice.

DESIGN AND METHODS: Body weight and composition, food intake, energy expenditure, and activity were determined weekly. mRNA expression of uncoupling protein 1 in brown adipose tissue, orexin, and brain-derived neurotrophic factor in the hypothalamus were quantified using real-time PCR.

RESULTS: Risperidone tended to induce a greater body weight gain (P = 0.052) and significantly higher food intake (P = 0.038) relative to the placebo-treated group. Risperidone-treated mice had a higher resting energy expenditure (P = 0.001) and total energy expenditure (TEE) (P = 0.005) than the placebo group. There were no effects of treatment, time, and treatment by time on non-resting (or activity-related) energy expenditure between groups. Risperidone-treated mice showed a significantly lesser locomotor activity than placebo-treated mice over 3 weeks (P < 0.001). Risperidone induced a higher UCP1 mRNA (P = 0.003) and a lower orexin mRNA (P = 0.001) than placebo.

CONCLUSION: Risperidone-induced weight gain is associated with hyperphagia and a reduction in locomotor activity in C57BL/6J mice. Additionally, higher total and resting energy expenditure were
accompanied by higher levels of UCP1 mRNA in BAT. The increased TEE could not offset the total intake of energy through risperidone-induced hyperphagia, therefore resulting in weight gain in female C57BL/6J mice.

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