# Responsiveness of 5-HT$_{2C}$ receptors in repeatedly diazepam-injected rats: a behavioral and neurochemical study

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**Abstract:**

The role of 5-hydroxytryptamine (serotonin; 5-HT)$_{2C}$ receptors in anxiety and the anxiolytic effects of drugs is well documented. In view of the withdrawal anxiety associated with repeated diazepam intake, the present study concerns the efficacy of 5-HT$_{2C}$ receptors in rats treated with diazepam. Results show that diazepam injections at a dose of 2 mg/kg daily for two weeks increased weekly food intake and growth rate. Anxiolytic effects of the drug monitored in a light/dark activity box were not significant after single administration. One week and two weeks of administration elicited anxiolytic effects, which were smaller after two weeks of administration as compared to one week, suggesting the development of tolerance to the anxiolytic profile of diazepam. Moreover, three days' withdrawal from repeated administration elicited anxiogenic behavior in the light/dark activity box. The behavioral and neurochemical effects of 1-(m-chlorophenyl)piperazine (m-CPP) (3 mg/kg), a 5-HT$_{2C}$ agonist, were monitored following withdrawal (three days) from two weeks of diazepam administration. Results showed that hypophagic as well as anxiogenic-like effects of m-CPP were not different from repeated saline or repeated diazepam-injected animals. Administration of m-CPP increased 5-HT metabolism in repeated saline as well as repeated diazepam-injected animals. However, m-CPP-induced increases in 5-HT metabolism were greater in repeated diazepam-injected animals. Results are discussed in the context of the role of 5-HT$_{2C}$ receptors in the precipitation of withdrawal anxiety.

**Key words:**
light/dark activity, food intake, m-CPP, diazepam, 5-HT, 5-HT$_{2C}$ receptors