

Effects of Clozapine and Risperidone Antipsychotic Drugs on the Expression of CACNA1C and Behavioral Changes in Rat 'Ketamine Model of Schizophrenia

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Abstract : Objectives: Calcium Voltage-Gated Channel Subunit Alpha1 C (CACNA1C) is one of the most important genes associated with schizophrenia. Methods: 45 male Wistar rats were divided into 5 groups: saline, control, ketamine, clozapine, and risperidone. Animals in ketamine, risperidone, and clozapine groups received ketamine (30 mg/ kg-i.p.) for 10 days. After the last injection of ketamine, we started injecting clozapine (7.5 mg/kg-i.p.) risperidone (1 mg/kg-i.p.) for up to 28 days. Twenty-four hours after the last injection, open field, social interaction, and elevated plus-maze tests, and gene expression in the hippocampus were performed. Results: The results of the social interaction test revealed a significant decrease in cumulative time with ketamine compared with the saline group and an increase with clozapine and risperidone compared with the ketamine group. Moreover, results from the elevated plus-maze test demonstrated a critical decrease in open-arm time and an increase in close-arm time with ketamine compared with saline, as well as an increase in open-arm time with risperidone compared with ketamine. Further results revealed a significant increase in rearing and grooming with ketamine compared to saline, as well as a decrease with risperidone and clozapine compared to ketamine. There were no significant differences in CACNA1C gene expression between groups in the rat hippocampus. In brief, the results of this study indicated that clozapine and risperidone could partially improve cognitive impairments in the rat. However, our findings demonstrated that this treatment is not related to CACNA1C gene expression.

Keywords : schizophrenia, ketamine, clozapine, risperidone

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