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THE USE OF BACOSIDES A AND B TO PREVENT A COGNITIVE DEFICIT IN SCHIZOPHRENIA RAT MODELS RESULTING IN INCREASED VESICULAR GLUTAMATE TRANSPORTER 2 (VGLUT2) IN THE CINGULATE GYRUS

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Background: Cognitive impairment is a debilitating symptom of schizophrenic patients causing functional disability. Neither typical nor atypical antipsychotic drugs are able to control it. There is a strong potential that Bacosides A and B from the plant *Bacopa monnieri* (Brahmi) could be a novel neuroprotective compound for the prevention of cognnitive deficits in schizophrenia.

Objective: To study neuroprotective effects of Brahmi on novel object recognition tasks and the cerebral VGLUT2 density in rat models that are schizophrenia induced through sub-chronic phencyclidine (PCP) administration.

Material and Method: Rats were divided into 3 groups; **Group-A**: Control; **Group-B:** PCP and **Group-C:** Bacosides A and B + PCP. Discrimination ratio (DR) representing cognitive ability was obtained from novel object recognition test. VGLUT2 density was measured in prefrontal cortex, striatum, cornu ammonis fields 1 (CA1) 2/3 (CA2/3) of hippocampus using immunohistochemistry.

Results: DR in the PCP-group was significantly decreased compared with the control group. This occurred alongside reduced VGLUT2 in the cingulate gyrus. Bacosides A and B + PCP group showed a significant increase in DR score compared with PCP alone. This occurred alongside a significant increase in VGLUT2 in the cingulate gyrus.

Conclusion: Cognitive deficit observed in rats receiving PCP administration was mediated by VGLUT2 reduction in the cingulate gyrus. Administration of Bacosides A and B before PCP administration can restore this cognitive deficit by increasing VGLUT2 density in this brain area to normal level. Conclusively, Bacosides A and B could be a novel neuroprotective compound for prevention of cognitive deficits in schizophrenia.

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