Pharmacological Reports
2011, 63, 372–380
ISSN 1734-1140

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Concomitant use of carbamazepine and olanzapine and the effect on some behavioral functions in rats

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Abstract:
As shown in clinical studies, combinations of first generation normothymics (carbamazepine – CBZ) with atypical neuroleptics (olanzapine – OLA) lead to improvements in approximately half of patients treated for relapses of bipolar affective disease. Our previous studies have shown OLA to have an antidepressant effect when administered at a dose of 0.5 mg/kg only upon single administration; the effect did not last throughout chronic administration, whereas CBZ administered at a dose of 30 mg/kg showed an antidepressant effect only after 7 days of administration. As shown in our previous studies, both OLA and CBZ improve memory in rats but only after chronic administration. The improved antidepressant effect of many drugs, including OLA and CBZ used in combined therapy – as observed in our clinic – as well as confirmed evidence of OLA's and CBZ's positive effects on cognitive functions in humans and animals substantiated commencement of research on defining the effect of combined administration of OLA and CBZ on sedation (tested in a locomotor activity test), antidepressant effect (Porsolt test) and spatial memory (Morris test) in animals. The tests were performed on male Wistar rats. It was found that in combined administration of CBZ and OLA for 7 and 14 days, OLA would completely prevent the CBZ's sedative effect. With combined administration of CBZ and OLA, both as a single dose and after prolonged treatment for 7 days, a significant reduction in immobility time was observed. Combined administration of CBZ and OLA did not improve memory in rats that received these drugs in a single dose, whereas statistically significant differences were observed in the chronic experiments. It can be assumed that the observed effects of combined administration of CBZ and OLA may be due to the pharmacokinetic interactions, but further studies are necessary to confirm these assumptions.

Key words:
carbamazepine, olanzapine, concomitant use, memory function, antidepressant activity, motor coordination, rats