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PREDICTIVE RELATIONSHIP BETWEEN DOPAMINE AND SEROTONIN ON EFFECT OF GINKGO BILOBA EXTRACT-761 IN THE TREATMENT OF OBSESSIVE COMPULSIVE DISORDER

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Drugs of herbal origin have proven to be effective in many anxiety disorders. EGb-761, EGB-761, a standardized extract of the Ginkgo biloba [Leaf] containing 24% of flavone glycosides (quercetin, kaempferol and iso rhamnetin) and 6% of terpenes (gingkolides and bilobalides) is an effective anxiolytic, neuroprotective and nootropic agent, despite its influential roles in various ailments of central nervous system, the data available in the treatment of obsessive compulsive disorder (OCD), a debilitating anxiety disorder and fourth most common forms of mental illness with server memory impairment, is scarce.

Materials and Methods. In this study, we evaluated the effect of Ginkgo biloba extract, EGb-761 50, 100 and 200 mg/kg on OCD using quinpirole (0.5 mg/kg) induced compulsive checking in rats and marble burying behaviour in mice. Rats were trained using Morris water maze apparatus before the induction of OCD and was used to evaluate the effect on spatial memory, the compulsions induced with quinpirole were assessed using an open field, on the last day of the treatment various behavioural parameters at each object were analysed such as: Frequency and duration of stops, Number of visits to other objects on successive return to each object and ritualistic behaviour for a period of 55 min.

Results. The effect on memory was evaluated based on the retention of the learned task i.e., time taken for the identification of the platform in Morris water maze apparatus and the underlying mechanisms are predicted based on the studies of brain monoamines such as dopamine and serotonin. EGb-761 at 100 and 200 mg/kg had shown significant improvement against quinpirole induced compulsions, a protective effect on memory task was observed in EGb treated rats. This could be attributed to the increase in serotonin and decrease in the dopamine levels. The interaction between the dopaminergic and serotonergic systems in the mid-brain regions i.e. substantia nigra and ventral tegmentum, with dopaminergic neurons being targets for serotonin cells explains the involvement of serotonin and dopamine in OCD. Activation of SHT₉_(auto) receptors inhibits dopamine release in the dorsal striatum and enhances dopamine release in nucleus accumbens. This explains the possible mechanism of the effect of SSRI’s in the treatment of DA agonist induced OCD, as quinpirole is agonist to D₂ and D₃ receptors in the striatum which in turn increases the dopamine levels. The increase in the serotonin concentration with EGb-761, its role on SHT₉_(auto)-receptors, which inhibit dopamine release and studies, on sertraline that it decreases the extracellular dopamine in the striatum, further supports the observation and the resulting decrease in dopamine levels observed in the present study, contributes to the protective effect of EGb and paroxetine in OCD. The protective effect of EGb-761 in the treatment of OCD is evident with both the performance on the open field and marble burying behaviour. The number of marbles buried by the end of 10 min was calculated after 1, 14, 28 days of treatment for all the groups.

Key words: Obsessive-compulsive disorder, Ginkgo biloba, memory, serotonin and dopamine.

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