EFFECT OF COMBINED TREATMENT WITH PAROXETINE AND TRANSCRANIAL MAGNETIC STIMULATION (TMS) ON THE MITOGEN-INDUCED PROLIFERATIVE RESPONSE OF RAT LYMPHOCYTES

Adam Roman, Jerzy Vetulani, Irena Nalepa

Laboratory of Intracellular Signalling, Department of Biochemistry, Institute of Pharmacology, Polish Academy of Sciences, Smętna 12, PL 31-343 Krakow, Poland


Depression is associated with abnormal functions of the immune system. In this study, we investigated how two modern antidepressant therapies, chronic treatment with transcranial magnetic stimulation (TMS) and administration of an antidepressant belonging to selective serotonin reuptake inhibitors (SSRI), paroxetine, affect the proliferative response of thymocytes and splenocytes stimulated in vitro with various mitogens. Paroxetine (10 mg/kg) and TMS (B = 1.2 T, f = 30 Hz, t = 330 s) were applied once daily for 12 consecutive days, while, if given jointly paroxetine was injected 30 min before TMS. The mitogens used were: concanavalin A (Con A), pokeweed mitogen (PWM) or lipopolysaccharide (LPS). While either treatment applied alone had no effect on proliferative response, the joint application of paroxetine and TMS significantly depressed it. The literature data suggest that pulsed magnetic field may directly inhibit mitogen-activated lymphocyte proliferation, which is also inhibited by the presence of high level of serotonin. The present results suggest that both effects are additive, and because of that application of both treatments, whose effects alone are insufficient to prompt the reaction, possibly because adaptive changes during chronic treatment, results in a significant inhibition of lymphocyte proliferation.

Key words: transcranial magnetic stimulation (TMS), paroxetine, thymocytes, splenocytes, proliferative response

Correspondence: e-mail: roman@if-pan.krakow.pl