Minocycline attenuates depressive-like behavior induced by rat model of testicular torsion: Involvement of nitric oxide pathway

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Testicular torsion/detorsion (T/D) can induce depression in pre- and post-pubertal patients. This study was conducted to investigate the psychological impact of testicular torsion and mechanism underlying its depressive-like behavior, as well as antidepressant-like activity of minocycline and possible involvement of nitric oxide (NO)/cyclic GMP pathway in this paradigm in male rats undergoing testicular T/D. Unilateral T/D was performed in 36 male adult Wistar rats, and different doses of minocycline were injected alone or combined with Nx-nitro-L-arginine methyl ester (L-NAME), non-specific NO synthase (NOS) inhibitor; aminoguanidine (AG), specific inducible NOS inhibitor; L-arginine, an NO precursor; and selective PDE5I, sildenafil. After assessment of locomotor activity in open-field test, immobility times were recorded in the forced swimming test (FST). Moreover, 30 days after testicular T/D, testicular venous testosterone and serum nitrite concentrations were measured. A correlation was observed between either a decrease in plasma testosterone or an increase in serum nitrite concentrations with prolongation in immobility time in the testicular T/D-operated rats FST. Minocycline (160 mg/kg) exerted the highest significant antidepressant-like effect in the operated rats in the FST (p<0.001). Furthermore, combination of sub-effective doses of minocycline (80 mg/kg) and either L-NAME (10 mg/kg) or AG (50 mg/kg) demonstrated a significant robust antidepressant-like activity in T/D group (p<0.01). Consequently, NO/cGMP pathway was involved in testicular T/D-induced depressive-like behavior and antidepressant-like activity of minocycline in the animal model. Moreover, a contribution was observed between either decreased testosterone or elevated serum nitrite levels and depressive-like behavior following testicular T/D.

Biography
Seyyedeh Elaheh Mousavi is an Assistant Professor of Pharmacology at Tehran Medical Science University. He has worked in different fields of Pharmacology in various in vivo and in vitro models. Currently, he has published more than 10 articles in the renowned journals of pharmacology.

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