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Chronic administration of propolis improves plasma levels of nitric oxide, calcium and cyclic guanosine monophosphate in selective serotonin reuptake inhibitors-induced erectile dysfunction in male Wistar rats

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Abstract

Background Sexual dysfunction is a common adverse effect for 50-80% of patients taking selective serotonin reuptake inhibitors. This could be very annoying and makes the patient scornful of his sexual aggrandizement despite thoughtlessly patronizing several sexual enhancing drugs. It also progressively leads to loss of confidence among couples with the psyche of searching for alternative sexual pleasure. The present study investigated the effect of chronic administration of propolis on plasma levels of nitric oxide, calcium and cyclic guanosine monophosphate which interplay in the physiological mechanism of erectile function. Methods Male Wistar rats (140-190g) that were sexually active and sexually unexposed females (120-130g) were employed in this study. Induction of erectile dysfunction was done in the male rats in groups II-VII by paroxetine hydrochloride 10mg/kg body weight orally for 2 weeks and confirmed by copulatory test with females. They were then randomly divided into seven groups of six rats (n=6) each and administered sildenafil or graded concentrations of propolis or 0.9% sodium chloride (group I) over a duration of 60 days. Following this, the animals were euthanized and blood samples collected for nitric oxide, calcium and cyclic guanosine monophosphate analysis. Results There was significant ($p<0.05$) increase in the plasma levels of nitric oxide of sildenafil treated group (III), high dose propolis treated group (VI), propolis-sildenafil combination treated rats (group VII); and significant ($p<0.05$) reduction in paroxetine-induced untreated rats (group II) and low dose propolis treated rats (group IV) compared to control (group I). However, there was no significant ($p>0.05$) difference between moderate dose treated rats (group V) compared to control group. There was significant ($p<0.05$) increase in plasma levels of calcium in group III, VI and VII while there was significant ($p<0.05$) reduction in calcium level of group II. However, there was no

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significant ($p>0.05$) difference in group IV and V. There was significant ($p<0.05$) reduction of cyclic guanosine monophosphate in group II, IV, and V, while significant ($p<0.05$) increase was seen in cyclic guanosine monophosphate of groups III, VI and VII compared to control. Conclusion Propolis has a key role to play in sexual functions through enhancement of erectogenic ability if given at high dose for sexual dysfunction by modulation of nitric oxide, calcium and cyclic guanosine monophosphate pathways in the physiological mechanism of penile erection.

Keywords

plasma levels;nitric oxide;calcium;cyclic guanosine

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