Phytochemical profile and protective effect of Ocimum basilicum aqueous extract in doxorubicin/irradiation induced testicular injury

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Abstract

Objectives
Combined chemotherapy and radiotherapy usually associated with various comorbidities especially on rapidly proliferating cells as testis. This study aimed to characterize main constituents of Ocimum basilicum L. (OB) aqueous extract and examine its protective effect on doxorubicin/irradiation (DOXO/IR) induced testicular injury in rats.

Methods
Spectrophotometric analysis showed considerable amount of polyphenolic (146.31 Õg/mg) and flavonoid contents (28.63 Õg/mg); UPLC ESI MS/MS analysis revealed that the major flavonoid was apigenin O glucoside (7.53%) followed by luteolin (5.94%), while rosmarinic acid was the major polyphenolic (15.76%) followed by caftaric acid (9.39%); rutin and querctin were also present and were quantified using high performance liquid chromatography. Administration of OB extract (200 mg/kg per day; p.o.) to DOXO/IR rats resulted in marked improvement of associated testicular damage.

Key findings
Ocimum basilicum L. significantly decreased testicular levels of nuclear factor kappa B and B cell lymphoma 2 (Bcl2) associated protein X, along with caspase 3 immunohistochemical staining. In addition, OB elevated testicular total antioxidant capacity, nuclear erythroid related factor 2, Bcl2 and testosterone contents and Ki 67 immunohistochemical staining. Such changes were also accompanied by restoration of testicular architecture.

Conclusions
The study highlights the protective role of OB aqueous extract in hampering most of the harmful chemotherapy/radiotherapy induced outcomes via its antioxidant, antiapoptotic and cell regeneration abilities. Such findings may offer an incentive in expanding its use during chemotherapy and radiotherapy.

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