Protective effect of Harmine on kidney disorders induced by nicotine in male mice

Faramarz Jalili[a*], Cyrus Jalili[b]

Authors' Affiliations:
[a] Students Research Committee, Kermanshah University of medical Sciences, Kermanshah, Iran;
[b] Department of Anatomy and Cell Biology, Kermanshah University of medical Sciences, Kermanshah, Iran;

Abstract Presenter:
Students Research Committee, Kermanshah University of medical Sciences, Kermanshah, Iran;
E-mail: Faramarz_jalili@yahoo.com
Mailing address: Faculty of Pharmacy, Kermanshah University of medical Sciences, Kermanshah, Iran.

****Correspondence:***
Students Research Committee, Kermanshah University of medical Sciences, Kermanshah, Iran;
E-mail: Faramarz_jalili@yahoo.com
Mailing address: Faculty of Pharmacy, Kermanshah University of medical Sciences, Kermanshah, Iran.

Abstract

Introduction: Harmine is one of the Harmal-deived alkaloids with anti-proliferatory effect on cell lines. Nicotine is a major toxic component of cigarette smoke and it is a major risk factor in the development of functional disorder of several organ systems. Nicotine from tobacco products is absorbed into the blood across the lungs, nasal and buccal mucosa. The current study aimed to investigate the effect of Harmine and Nicotine on the weight of kidney and number of glumeruli and glomerular diameter, kidney tissue and serum levels of nitric oxide, BUN, Creatinine and TAC in mice.

Methods and Results: In this study, 48 male Mice were divided in to 8 groups: control, nicotine–treated group (2.5 mg/kg/day); harmine-treated groups (5,10, 15 mg/kg./day); and nicotine and harmine treated group intraperitoneal administration for successive 14 days. These mice were randomly assigned to 8 groups(n=6). After 24 hours animal were killed , the kidney was sampled: tissue sections were prepared and examined by light microscope. weight of kidney and number of glumeruli and glomerular diameter and serum levels of nitric oxide, BUN, Creatinine and TAC (Total antioxidant capacity) were analyzed (one-way ANOVA). Then data were $P<0.05$ was considered significant. The results indicate that nicotine administration significantly increased BUN, creatinine and nitric oxide levels compared to saline group ($P<0/05$). Harmine (10, 15 mg/kg./day) significantly decreased BUN, creatinine and nitric oxide levels compared to control group and nicotine group ($p<0.05$). Nicotine treatment significantly increased glomerular diameter compared to control group ($p<0.05$). as well as, nicotine administration significantly decreased TAC levels compared to saline group ($P<0/05$). Histopathology of the kidney confirmed the changes induced by nicotine and the renal protection effect of harmine.

Conclusions: It seems that harmine administration could improve kidney changes and prevented nicotine-induced adverse effects on serum levels of nitric oxide, BUN and Creatinine and Total antioxidant capacity.

Key words: Harmine, Nicotine, nitric oxide, mice

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