THE ROLE OF VITAMIN E AND L-CARNITINE ON THE TESTIS OF THE ADULT ALBINO RATS AFTER PREPUBERTAL EXPOSURE TO NICOTINE

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ABSTRACT

Background: Nicotine is an important alkaloid contained in the tobacco leaves. It induces oxidative stress both in vitro and in vivo. Vitamin E (alpha tocopherol) regulates the oxidation processes in the body as it acts as a powerful antioxidant. L-carnitine may serve as a scavenger of free radicals.

Aim of the work: To study the possible protective role of vitamin E and L-carnitine against the injurious effect of nicotine on the testis of prepubertal male albino rats.

Material and Methods: Seventy male albino rats were divided into five groups, ten rats each. Group (1) included control untreated rats, vitamin E treated rats and L-carnitine treated rats, group (2) included rats were injected intraperitoneally with nicotine at a dose of 7 mg/kg once per day for four weeks, group (3) included rats were injected with nicotine at the same dose as in group 2 with co-administration of vitamin E at a dose of 60 mg/kg orally via gastric tube once per day for four weeks, group (4) included rats were injected with nicotine at the same dose as in group 2 with co-administration of L-carnitine at a dose of 300 mg/kg intraperitoneally once per day for four weeks and group (5) included rats were injected with nicotine with co-administration of vitamin E and L-carnitine for four weeks.

Results: Examination of sections of the testis of group (2) (nicotine treated group) showed marked loss of normal architecture with irregular arrangement of the germ cells. The spermatocytes were swollen. Several degenerative changes were detected in germ cells. Moreover, the basement membrane was thickened and that was confirmed by the PAS stain. The scanning electron microscope revealed the presence of homogenous material in the lumen of most of the tubules. Examination of group (3, 4 and 5) revealed improvement with almost regaining of the normal histological architecture as compared to control group of the testis.

Conclusion: pre-pubertal exposure to nicotine led to injurious effect on the testis with delayed puberty. However administration of vitamin E and L-carnitine ameliorate these effects. Co-administration of both vitamin E and L-carnitine together gives better results than each one alone.

Key words: Nicotine, vitamin E, L-carnitine, Testis, albino rat.

INTRODUCTION

Nicotine is an important alkaloid present in the tobacco leaves. When inhaled during smoking, it is rapidly absorbed into the circulatory system where more than 80% of it is metabolized in the liver. Nicotine induces oxidative stress both in vitro and in vivo as well as depletes the antioxidant defense mechanisms.