Iranian Journal of Pharmaceutical Research (2007), 6 (4): 279-283
Received: August 2006
Accepted: February 2007

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Original Article

Effect of Metronidazole on Spermatogenesis, Plasma Gonadotrophins and Testosterone in Male Rats

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Abstract

Metronidazole and it's derivatives are drugs that have both antiprotozoal and anti bacterial effect. The reproductive toxicity of metronidazole has been shown in some studies. To investigate the effect of metronidazole on spermatogenesis in adult male rats, this study was designed.

Eighteen wistar male rats (70-90days old) were randomly divided into three groups. Animals in group I (Control group) were administered the water. Animals in groups II, III were administered metronidazole at doses of 200 and 400 mg/kg/day for 60 days. Different varieties of germ cells at stage VII seminiferous epithelium cycle, namely, type A spermatogonia (ASg), preleptotene spermatocytes (pLSc) and step 7 spermatids (7Sd) were quantitatively evaluated, along with radioimmunoassay of plasma follicle-stimulating hormone (FSH), luteiniging hormone (LH), testosterone assessment.

In the 200 and 400 mg/kg groups, there were significant decreases in the testes and accessory sex organ weights, plasma concentrations of LH, FSH and testosterone with massive degeneration of all the germ cells at stage VII.

It is concluded that metronidazole has a suppressive influence on spermatogenesis and sex hormones in rats.

Keywords: *Metronidazole; Spermatogenesis; Gonadotrophins; Testosterone.*

Introduction

Metronidazole is used clinically to treat genital tract infection in both men and women. The antispermatogenic effect of metronidazole has also been shown in some studies (1-2). Other derivatives of metronidazole as well as ornidazole exert a rapid and reversible antifertility effect in male rats (3-5). In dogs, humans and rats, one of the metabolites of ornidazole is the C_3-chloro side-chain of the nitroimidazole ring (6-7) which may produce 3-chlorolactaldehyde and α-chlorohydrin known inhibitors of the glycolytic enzymes glyceraldehyde 3-phosphate dehydrogenase (GAPDH) and triosephospahte isomerase (TSI) in spermatozoa (8-9). This is in accordance with the results of a study that reported a 32% inhibition of GAPDH and a 52% inhibition of TPI activities in male rat spermatozoa after administration of 400 mg/kg/day ornidazole for 10 days (10). Therefore, the infertility action of ornidazole appears to be result of its effect on the ability of spermatozoa to ultimately obtain ATP by the glycolytic pathway (11).

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