



## The Effect of Silymarin on Spermatogenesis Process in Rats

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### ABSTRACT

Free radicals and oxidation of germ cells in the testis tissue can reduce sperm levels and cause infertility in men. Silymarin is a compound with antioxidant effects. So, this study is aimed to evaluate the effects of Silymarin on spermatogenesis, tissue changes of testis and hypothalamic-pituitary-gonadal axis processes in rats. 40 adult male Wistar rats were prepared and divided into 5 groups including control, sham and experimental groups receiving silymarin. Blood samples were obtained and serum LH, FSH, GnRH and testosterone levels were measured. Testicular tissue sections were prepared and spermatogonia, primary and secondary spermatocytes, spermatids, spermatozoa, Sertoli and Leydig cells were counted by light microscopy. One-way analysis of variance (one-way ANOVA) and Duncan test at significance level of  $p \leq 0.05$  were used to analyze the data. The mean concentrations of FSH, GnRH and LH hormones in experimental groups receiving silymarin at concentration of 150 mg/kg showed a significant increase compared to the control group. Silymarin at concentrations of 100 and 150 mg/kg significantly increased testosterone hormone compared to the control group. Silymarin at concentrations of 100 and 150 mg/kg significantly increased the number of spermatids and spermatozoa cells compared to the control group. Due to the antioxidant property of silymarin, this compound increases the secretion of LH, FSH, GnRH and testosterone and the number of spermatids and spermatozoa cells in rats.

**Keywords:** Silymarin, Spermatogenesis Process, Rat

### INTRODUCTION

Infertility and its related problems have known as one of the major issues in couples' life [1]. The most common cause of infertility in men is their inability to produce a sufficient number of healthy and active sperms [2, 3]. Several factors can affect sperm production that among them can mention to consumption of chemotherapy drugs for cancer, antibiotics, toxins, pesticides, radiations, stress, air pollutions and lack of adequate vitamins. It has been found that the noted factors can reduce sperm levels by production of free radicals and oxidation of germ cells in the testis tissue [4, 5]. Studies have shown that the use of antioxidants can be effective in treatment of infertility in men through reduction of damages caused by free radicals, strengthening the blood-testis barrier and protecting and repairing of sperm DNA [5, 6].

Silymarin is a flavonoid polyphenolic compound extracted from *Silybum marianum* seeds. Silymarin ingredients contain silybin or silibinin (36.3%), silydianin (5.9%), silychristin (5.7%), taxifolin (1.9%) and other minor compounds [7]. Silybin and silychristin have the highest biological activity among the other ingredients. Numerous studies have been done till now on the therapeutic and biological properties of silymarin. Among its properties can point to anti-inflammatory, antioxidant, anti-cancer and hepatoprotective properties [8, 9]. Antioxidant and protective properties of silymarin have proved in laboratory animals with acute or chronic lesions caused by various medicines or toxins [10]. Silymarin plays its own antioxidant role with scavenging free radical as well as increasing the levels of glutathione peroxidase and superoxide dismutase (SOD) [11].