



Therapeutic Effect of Thymoquinone against Methotrexate-Induced Damage on Sperm Parameters in Mice

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Abstract

Background: Methotrexate drug is commonly used to treat cancer and caused reproductive damage. Thymoquinone, as a natural component of herbs has many healthy benefits shown in researches. The present study aimed to investigate probable therapeutic effect of Thymoquinone against Methotrexate- induced damage on sperm parameters in mice.

Material and Methods:

In this experimental study, 30 male mice (25-30 g) were divided into five groups of six in each. The mice were received normal saline (control group), Methotrexate (20 mg/kg), Methotrexate (20mg/kg) + Thymoquinone (2, 10 and 20mg/kg) by intraperitoneal injection. On the day after the last injection, the sperm parameters including motility, viability and count of sperms were assessed. Data analysis was performed using one-way ANOVA followed by Turkey test.

Results: Methotrexate alone led to a significant reduction in sperm parameters compared to the control group (P=0.00). In groups treated with Methotrexate and Thymoquinone, sperm parameters (motility, viability, count sperm) did not show any significant differences with control group (P=0.00).

Conclusion: Thymoquinone, as a potent antioxidant, could compensate for the toxicity induced by Methotrexate. These medical trend

may be useful for diminish the side effects of Methotrexate on male reproductive system.

Keyword: Thymoquinone, Methotrexate, Sperm, Mice

Introduction

Methotrexate (MTX) as a mild immunosuppressant drug, exhibiting anti-inflammatory activity, has been represented for the treatment of some cancers [1]. However, studies in animals have shown degeneration in cellular component of seminiferous tubules affecting spermatogenesis [2] and in men, some reports of oligospermia outbreak in psoriasis patients, both following undertaking MTX [3]. These harmful side effects of MTX on male reproductive system, as a part of its adverse effects, have limited the application of the drug and researches are conducted to overcome this limitation by some trends like co-administration with natural products.

Plants and their derivatives play a key role in world health and thirty percent of all modern drugs are developed from these natural resources [4]. In addition, Plants have a long folklore of use in aiding fertility, including fertility-enhancing properties and aphrodisiacal qualities [5-6].

Nigella sativa L. belongs to the botanical family of ranunculaceae [7]. It has been known as black seed and its seeds are frequently used in folk