ABSTRACT

This study was designed to investigate the effects of Nigella sativa L. (NS), known as black seed, or/and Urtica dioica L. (UD), known as stinging nettle root, treatments on serum Na, K, Cl, and Ca levels and some hematological values of CCl4-treated rats. Sixty healthy male Sprague–Dawley rats, weighing 250–300 g, were randomly allotted into 1 of 4 experimental groups: A (CCl4-only treated), B (CCl4+UD treated), C (CCl4+NS treated), and D (CCl4+UD+NS treated), each containing 15 animals. All groups received CCl4 (0.8 mL/kg of body weight, subcutaneously, twice a week for 90 d starting d 1). In addition, B, C, and D groups also received the daily ip injection of 0.2 mL/kg NS and/or 2 mL/kg UD oils for 45 d starting d 46. Group A, on the other hand, received only 2 mL/kg normal saline solution for 45 d starting d 46. Blood samples for the biochemical analysis were taken by cardiac puncture from five randomly chosen rats in each treatment group at the beginning, d 45, and d 90 of the experiment. The CCl4 treatment for 45 d significantly (p<0.05) increased the serum K and Ca and decreased (p<0.05) the red blood cell count (RBC), white blood cell count (WBC), packed cell volume (PCV), and Hb levels without changing (p>0.05) the serum Na and Cl levels. NS or UD treatments (alone or combination) for 45 d starting d 46 significantly (p<0.05) decreased the elevated serum K and Ca levels and also increased (p<0.05) the reduced RBC, WBC, PCV, and Hb levels. It is concluded that NS and/or UD treatments might ameliorate the CCl4-induced disturbances of anemia, some minerals, and body’s defense mechanism in CCl4-treated rats.

Index Entries: CCl4-treated rats; Nigella sativa L.; Urtica dioica L.; minerals; hematological values.
INTRODUCTION

Carbon tetrachloride (CCl₄) is a selective hepatotoxic chemical agent. CCl₄ initiates cell damage by causing lipid peroxidation. It is used by many investigators to produce liver cirrhosis in experimental animals (1).

*Nigella sativa* L. (NS), known as black seed, belongs to the Ranunculaceae family. This seed has been used in many Middle East countries as a natural remedy. It has been shown that the seed oil of NS contains thymoquinone and many monoterpenes such as *P*-cymene, and *α*-pinene and has insecticide, bronchodilator (2), immunomodulative (3), antibacterial (4), hypotensive (5), choleraic, antitumoral (6), antifungal, anthelmintic, and antiasthmatic effects.

*Urtica dioica* L. (UD), known as stinging nettle root, is a plant belonging to the plant family Urticaceae. Its seeds are widely used in folk medicine in many parts of Turkey, especially in the therapy of advanced cancer patients. Polar extract of the UD contains the lignans (+)-neoolivil, (–)-secoisolariciresinol, dehydrodiconiferyl alcohol, isolariciresinol, pinoresinol, and 3,4-divanillyltetrahydrofuran and has anti-inflammatory effects (7,8) and stimulates the proliferation of human lymphocytes (9).

Blood mineral status and hematological values are important for monitoring of health status and diagnosis of diseases. Therefore, this study was designed to investigate (1) the serum Na, K, Cl, and Ca levels and some hematological values of CCl₄-treated rats, (2) the effects of *Nigella sativa* L. and/or *Urtica dioica* L. treatments on these parameters in CCl₄-treated rats.

MATERIALS AND METHODS

Plant Materials and Extraction Procedure

The NS and UD seeds were purchased from a local herb store in Van, Turkey. Voucher specimens have been kept at the Department of Biochemistry, Yuzuncu Yil University, Van, Turkey for future reference. The seeds of NS were powdered in a mixer and placed in a distillation flask; the volatile oil with 0.2% yield was collected by steam distillation. The fixed oil of UD was extracted with the help of a rotary evaporator apparatus using diethyl ether as the solvent.

Treatment of Rats

Sixty healthy male Sprague–Dawley rats, weighing 250–300 g, and averaging 5.5 mo of age were utilized in this study. The rats were randomly allotted into 1 of 4 experimental groups: A (CCl₄-only treated), B (CCl₄+UD treated), C (CCl₄+NS treated), and D (CCl₄+UD+NS treated),