• Case Report

A case study report of acute renal failure associated with *Nigella sativa* in a diabetic patient

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1 Introduction

*Nigella sativa*, known as black seed, has analgesic, anti-inflammatory, antioxidant and anticancer effects[1-3]. It has been shown to reduce the development of kidney failure when given prior to the use of nephrotoxic drugs particularly due to its antioxidant action[4-7]. However, as far as the authors could ascertain, there is no human study in literature showing these effects. Here we present a case of acute renal failure after the use of *N. sativa*, rather than exhibiting antioxidant or antidiabetic effects.

2 Case report

A 62-year-old female patient suffering from diabetes mellitus for 12 years, along with coronary artery disease and hypertension for one year, was hospitalized due to deterioration of her glycemic control. The average glycemia results before admission of the patient were between 220 to 270 mg/dL. She had, eight years prior to treatment, a total abdominal hysterectomy and bilateral salpingo-oophorectomy operation. On physical examination, the liver was palpable 1 cm below the rib, and pretibial edema (+/+) was present. Laboratory evaluation of the patient on the first day of admission was as follows. Blood urea nitrogen (BUN): 44 mg/dL; creatinine: 1.16 mg/dL; sodium (Na⁺): 135.1 mmol/L; potassium (K⁺): 4.86 mmol/L; aspartate aminotransferase (AST): 30 IU/mL; alanine aminotransferase (ALT): 24 IU/mL; in complete urinalysis, in every field there were 1 to 2 white blood cells and few granulary cylinders. Her fasting glycemia was 246 mg/dL. In urine culture, no growth of pathogenic microorganism was observed. Her insulin doses were adjusted for the regulation of glycemia. Her urine volume on the first admission day was 1 200 mL. According to the patient’s own statement, she started to use *N. sativa* tablets which she bought before admission, from the first day of her admission, as 2 to 3 tablets a day. On the third day of admission, her BUN was 65 mg/dL and creatinine was 1.39 mg/dL; and on the sixth day, BUN was 89 mg/dL, creatinine was 1.85 mg/dL, and urine microscopic examination was normal. Liver enzymes did not change during this period. Hepatobiliary ultrasound examination revealed grade 1 to 2 hepatosteatosis. After development of acute renal failure, fractionated Na⁺ excretion (FeNa) was calculated as 1.88%. A detailed drug history was taken and she stated that she was taking the afore mentioned *N. sativa* tablets for 6 d at approximately 2 000 to 2 500 mg/d. With continuing use of her same previous drugs and no addition of any other medication by medical staff, the patient was questioned again in detail. The possible use of any other nephrotoxic drugs was investigated, but nothing was found. On urinary tract ultrasound examination, there was no pathology indicating a cause for acute renal failure. Urinary Na⁺ was 95 mmol/L. Following the cessation of the agent, on the fourth day, BUN declined to 42 mg/dL, and creatinine
was 1.17 mg/dL. These results lead us far from prerenal causes of acute renal failure and the patient’s mentioned acute renal failure was thought to be due to the use of *N. sativa*.

3 Discussion

Reference to alternative medicine is quite common in Africa, India, Latin America, the Middle East, Asia and also in Turkey\[8\]. The most common disorders treated with alternative medicine in adults are anemia, diabetes and migraine. In a study of diabetic patients, the frequency of herbal use was 41%\[9,10\]. The expectation that herbal medicines will be harmless, as a completely natural product, underlies the high usage frequency of herbal products\[11,12\].

In diabetic patients, the incidence of toxicity due to the use of herbal medicines is unknown. Few patients would report the usage to his or her doctor. Very few studies mentioned alternative medicine-related toxicity in diabetic patients\[13-15\]. Mostly observed side effects are headache, nausea, vomiting, palpitations and sweating\[16\].

*N. sativa* is the most commonly used herbal antidiabetic drug in patients with diabetes. In an animal study, it was found that *N. sativa* reduced hepatic glucose output from gluconeogenic precursors\[17\]. In the same study, *N. sativa* usage in diabetic rats increased the phagocytic activity of peritoneal macrophages, an issue supporting the earlier studies\[18,19\].

The main active ingredient of *N. sativa*, thymoquinone, has antioxidant effects\[6\]. It neutralizes free oxygen radicals and prevents tissue damage. Many studies aimed at determining its effects on ischemia or drug-induced hepatotoxicity and nephrotoxicity. In these studies, *N. sativa* had a positive effect on elevations of serum N. sativa hepatotoxicity and nephrotoxicity. In these studies, *N. sativa* had a positive effect on elevations of serum N. sativa had a positive effect on elevations of serum N. sativa had a positive effect on elevations of serum.

In diabetic patients, we assert that the use of *N. sativa* tablets 2,000 to 2,500 mg/d may be nephrotoxic, though we have not reached any previous information in this subject. In diabetic patients with acute renal failure, especially when no other underlying etiological factor is detectable, the use of herbal medicine and especially *N. sativa* should be questioned.

4 Competing interests

The authors declare that they have no competing interests.

REFERENCES


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