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Case Report

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Black seed oil induced acute liver failure: a case report and literature review

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ABSTRACT

Acute liver failure (ALF) is a clinical condition that develops suddenly in individuals with no history of liver disease due to various factors and has a high morbidity and mortality rate. Drugs, chemicals, and herbal products are the leading causes of ALF. Black seed is widely used among the population due to its diuretic, antihypertensive, antidiabetic, anticancer, antimicrobial, anti-inflammatory, gastroprotective, hepatoprotective, kidney-protective, and antioxidant properties. In this report, an 82-year-old female patient with a history of diabetes, hypertension, and chronic kidney disease who received hemodialysis treatment twice a week was examined for ALF due to black seed oil use. The patient, who applied to the emergency room with confusion, had increased liver function tests in laboratory findings. In addition, no pathology was detected in the patient's computed tomography angiography and ultrasonography other than grade 1 steatosis and increased linear echogenicity in the liver. The patient, who was diagnosed with ALF, started treatment in the intensive care unit. The patient, who had a poor prognosis in the intensive care unit, died on the 9th day of her hospitalization. Considering the studies in the literature and the patient we examined, although it is thought to be harmless among the public, herbal products should not be used with medications and in patients receiving renal replacement therapy without the advice of a physician or pharmacist due to their possible toxic effects.

Keywords: Acute liver failure, herbal products, black seed

INTRODUCTION

Acute liver failure (ALF) is a rare, life-threatening condition that occurs in patients with no preexisting liver disease and is characterized by liver injury (abnormal liver tests), coagulopathy [international normalized ratio (INR) >1.5], and hepatic encephalopathy (HE). ALF shows a poor prognosis. Since morbidity and mortality rate of patients are high, timely recognition and management of patients is crucial. Viral hepatitis and drug-induced hepatitis are most common cause of ALF. Other causes include hypoxia and hypoperfusion, veno-occlusive disease, Wilson disease, autoimmune hepatitis, hemolysis, elevated liver enzymes, low platelet (HELLP) syndrome, mushroom toxicity, some herbal products and malignant conditions.[1]

Drug-induced acute liver injury is a common clinical condition that can range from mild elevations in liver enzymes to death. Herbal products are among the important causes of drug-induced acute liver damage. It is estimated that the incidence of herbal product-induced acute liver injury reaches up to 20%.[2]

Black seed (*Nigella sativa* L.) is widely used in the treatment of various diseases among the public due to its antioxidant and anti-inflammatory effects. It is a member of the Ranunculaceae family and is widely used to prevent and treat various diseases. The active ingredient responsible for the therapeutic effect of black cumin is thymoquinone. Studies have reported that *Nigella sativa* has diuretic, antihypertensive, antidiabetic, anticancer, immunomodulatory, analgesic, antimicrobial, anthelmintic, analgesic, anti-inflammatory, spasmolytic, bronchodilator, gastroprotective, hepatoprotective, kidney-protective and antioxidant properties.[3-6] In this letter, acute liver damage in a patient who used black seed oil to improve kidney functions was examined.

CASE

An 82-year-old female patient presented to the emergency department due to confusion. The patient had a medical history of diabetes, hypertension, and chronic kidney disease. Before admission to the intensive care unit, the patient used linagliptin, perindopril/indapamide, paroxetine, clopidogrel, cilostazol, aspirin, and sodium hydrogen phosphate. One month ago, the nephrology department enrolled her in a routine hemodialysis program, and she has been undergoing hemodialysis twice a week. Laboratory tests revealed elevated levels of lactate, transaminase, and bilirubin. Additionally, other liver function tests were abnormal (Table). Acute liver

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failure was considered in the patient who was admitted to the intensive care unit.

Table. Laboratory findings of the patient on the first day of intensive care admission

Parameter	Patients' value	Reference range
ALT	565 U/L	<35 U/L
AST	471 U/L	<35 U/L
Albumin	26.3 g/dl	3.5-5.5 g/dl
Total bilirubin	2.33 mg/dl	0.3-1 mg/dl
Direct bilirubin	1.49 mg/dl	0.1-0.3 mg/dl
INR	2.65	0.9-1.2
Lactate	3.5 mmol/L	0.5-1 mmol/L

ALT: Alanine aminotransferase, AST: Aspartate aminotransferase, INR: International normalized ratio

A full abdominal computed tomography angiography and ultrasonography were performed to patient and showing no signs of ischemia or thrombus. In addition, findings included grade 1 steatosis and increased linear echogenicity in the liver. The family stated that they had been giving the patient black seed oil capsules for the last month for the treatment of renal failure.

Despite the intermittent dialysis and other treatments applied to the patient during the intensive care treatment, the patient's liver functions did not improve her hemodynamics deteriorated, and she died on the 9th day of her admission to the intensive care unit.

RESULTS

Herbal products are used to prevent and treat many diseases with the idea that they are "safe" among the population. Although numerous studies have been conducted on the role of herbal products in treatment, only a limited number have demonstrated well-documented pharmacological, toxicological, and clinical effects. Therefore, herbal products should not be used as primary treatments for diseases but rather as complementary therapies, and only under the guidance of a qualified healthcare professional, such as a physician or pharmacist. Herbal products used unconsciously can cause harmful effects on patients and can interact with other medications of patients, resulting in treatment failure and drug toxicity. Various complications such as hepatotoxicity, nephrotoxicity, electrolyte disorders, hypertension, cardiac arrhythmia, seizures, coagulation problems, and death may occur in patients due to the use of herbal products.[7-9] In vivo studies on black seed have reported low toxicity, and reported toxicity symptoms to include respiratory distress, leukopenia, thrombocytopenia, kidney, liver, and heart toxicity.[10,11] It has been reported that allergic contact dermatitis has developed in patients due to the external use of cosmetic preparations containing black seed.[12,13] The number of clinical studies investigating the effects of black seed is limited. In the clinical study conducted with healthy volunteers investigating the effects of black seed on memory, attention, and cognition, no toxic effects were reported in patients due to the use of black seed.[14] In a placebo-controlled clinical study evaluating the antiepileptic effects of thymoquinone, no toxicity was observed. However, the incidence of nausea and vomiting was reported to be higher among patients receiving thymoquinone compared to placebo group.[15] In a case report published by Sener et al.,[16] it was reported that a patient developed rhabdomyolysis and acute kidney injury due to the use of black seed oil.

CONCLUSION

Although studies in the literature inicate that the use of products containing black seed is safe, the interactions of drugs used with black seed and the possible effects on the prognosis of diseases in various patient populations have not been sufficiently studied. Therefore, herbal products containing black seed should be used with caution in patients with chronic diseases and those taking medications. As with other herbal supplements, herbal products containing black cumin should only be used with the advice of a physician or pharmacist.

ETHICAL DECLARATIONS

Informed Consent

The patient signed and free and informed consent form.

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

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Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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