

MEDIASTINAL EMPHYSEMA AND ALVEOLAR HEMORRHAGE FOLLOWING TRIBULUS TERRESTRIS HERBAL PRODUCT USE: A CASE REPORT

Keywords

Tribulus terrestris,

Herbal toxicity,

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ABSTRACT

Tribulus terrestris L. is an annual herb widely used for various traditional medicinal purposes. Within the Zygophyllaceae family, it has long been utilized particularly in Chinese and Indian medical systems due to its reported immunomodulatory, aphrodisiac, antiurolithic, absorption-enhancing, cardioprotective, antidiabetic, anti-inflammatory, hypolipidemic, neuroprotective, anticancer, and analgesic properties (1,2). Saponins and flavonoids, two major bioactive components of *T. terrestris*, are believed to contribute significantly to its therapeutic effects. However, despite its popularity, the potential toxic effects of this herbal product remain insufficiently studied. In this report, we present a rare case of mediastinal emphysema and alveolar hemorrhage following the use of a mixed herbal preparation containing *Tribulus terrestris* (commonly known as “demir döven”).

INTRODUCTION

Tribulus terrestris L. is an annual herb widely used for various traditional medicinal purposes. Within the Zygophyllaceae family, it has long been utilized particularly in Chinese and Indian medical systems due to its reported immunomodulatory, aphrodisiac, antiurolithic, absorption-enhancing, cardioprotective, antidiabetic, anti-inflammatory, hypolipidemic, neuroprotective, anticancer, and analgesic properties^{1,2}. Saponins and flavonoids, two major bioactive components of *T. terrestris*, are believed to contribute significantly to its therapeutic effects. However, despite its popularity, the potential toxic effects of this herbal product remain insufficiently studied.

In this report, we present a rare case of mediastinal emphysema and alveolar hemorrhage following the use of a mixed herbal preparation containing *Tribulus terrestris* (commonly known as “demir döven”).

CASE REPORT

41-year-old male presented to the emergency department with hemoptysis consisting of bright red blood mixed with sputum, approximately 10–20 cc in volume. He denied fever, cough or increased sputum production. His past medical history was unremarkable, and he had no chronic illnesses. He reported no similar symptoms previously. The patient was an active smoker with a 10 pack-year history and denied alcohol, illicit drug, or medication use. He was born in Samsun and worked as a muezzin.

On physical examination, he was alert, cooperative, and fully oriented. Vital signs were as follows: blood pressure 110/76 mmHg, pulse 64/min, oxygen saturation 97% on room air, and temperature 36°C. Bilateral crackles were heard on lung auscultation, while other system examinations were normal.

Laboratory tests showed: Hemoglobin 13.4 g/dL, INR 1.07, D-dimer 190 ng/mL, CRP 1 mg/dL, troponin-T 3.00 ng/L. No pathological findings were noted.

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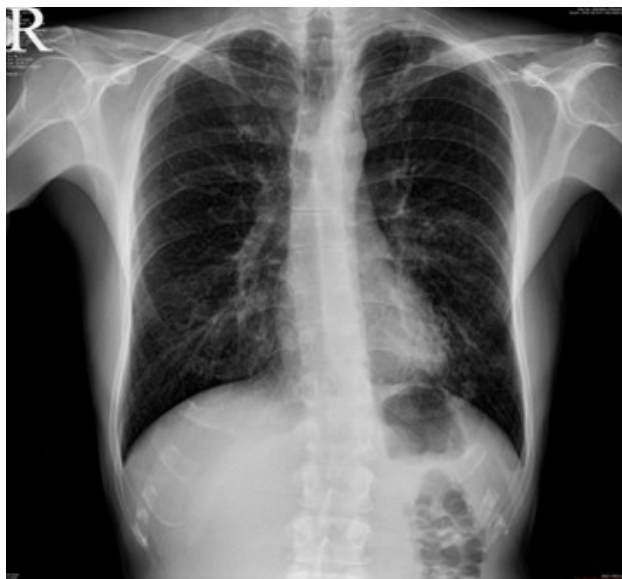
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Chest radiography revealed increased aeration in both lungs lingular segment of the left upper lobe, and the right middle and reticular opacity in the mid-zone of the left lung (Figure 1). lobe. Fibrotic sequelae were observed in apical regions. Air A subsequent thoracic Computed Tomography showed densities in the mediastinum were consistent with prominent ground-glass opacities in both lower lobes, the pneumomediastinum (Figure 2).



(Figure 1) Chest X-ray taken at the time of emergency room admission



(Figure 2) CT scan at the time of emergency room admission

In light of mediastinal emphysema, thoracic surgery intravenous tranexamic acid (50 mg/mL, 3×1) and oral consultation was obtained. Bronchoscopy and daily chest X-ray monitoring were recommended. amoxicillin-clavulanate (1000 mg, 2×1) was initiated. Sputum culture, AFB testing, and an extensive rheumatologic panel were ordered. Bronchoscopy revealed bronchoalveolar lavage

The patient was admitted to the pulmonology ward with a fluid consistent with alveolar hemorrhage (Figure 3). preliminary diagnosis of hemoptysis. Treatment with



(Figure 3) Bronchoalveolar lavage sample taken during bronchoscopy procedure

During follow-up, the patient developed hypoxemia on room 4a,4b). Thoracic surgery again recommended close vital air. Repeat thoracic CT showed regression of ground-glass monitoring and daily chest imaging. opacities but progression of mediastinal emphysema (Figure



(Figure 4a) Control toraks CT scan



(Figure 4b) Control toraks CT scan

On the third day of hospitalization, the patient experienced massive hemoptysis (~350 cc of bright red blood) and clinical deterioration. He was transferred to the pulmonary intensive care unit, and continuous tranexamic acid infusion was started.

A detailed reassessment of the history in the intensive care unit revealed that the patient had been using an herbal paste to “feel better”. The preparation contained Shiitake, Guggul, *Tribulus terrestris*, Schisandra pollen, and propolis.

Rheumatologic tests were negative. Throughout hospitalization, serial hemoglobin monitoring showed no significant decline. No clinical findings suggesting vasculitis or connective tissue disease were identified. Considering symptom onset after herbal product ingestion and the absence of other etiologies, alveolar hemorrhage and pneumomediastinum secondary to *Tribulus terrestris* use were considered the most likely diagnoses.

By the third day in the ICU, active bleeding subsided, and hypoxemia improved; therefore, the patient was transferred back to the pulmonology ward. He was thoroughly counseled about the risks of herbal products and the potential complications. After stabilization and complete resolution of hemoptysis, he was discharged with recommendations.

DISCUSSION

Tribulus terrestris is widely used worldwide, particularly for enhancing male fertility, improving physical performance, and exerting antioxidant effects^{1–3}. Despite its widespread perception as a safe herbal supplement, increasing evidence suggests that its bioactive constituents—especially steroidal saponins and flavonoids—may be associated with serious systemic adverse effects in rare cases³. Experimental and clinical data indicate that these compounds may adversely affect endothelial function, increase vascular permeability, and impair bronchoalveolar integrity^{4–6}.

Protodioscin, a major saponin component of *T. terrestris*, is known to stimulate testosterone production via luteinizing hormone activation. However, experimental and clinical studies have shown that protodioscin and related saponins may disrupt capillary integrity and induce endothelial dysfunction and microvascular injury, thereby predisposing to hemorrhagic manifestations, including alveolar hemorrhage^{4,6}. In addition, oxidative–antioxidant imbalance associated with *T. terrestris* use may promote excessive reactive oxygen species generation, further contributing to pulmonary endothelial damage and bleeding⁵.

Most previously reported adverse effects related to *T. terrestris* primarily involve hepatotoxicity, nephrotoxicity, and hypotension^{6,7}. Case reports describing severe organ toxicity support the notion that *T. terrestris* may exert systemic toxic effects beyond its purported therapeutic

benefits⁷. Direct pulmonary involvement has been reported exceedingly rarely and has generally been limited to nonspecific respiratory findings or indirect pulmonary injury mechanisms^{5,6}. In contrast, the concurrent development of alveolar hemorrhage and pneumomediastinum observed in the present case represents an unusual and severe clinical presentation, suggesting a potential pulmonary toxic effect associated with *T. terrestris* use.

Pneumomediastinum typically results from alveolar rupture due to increased intra-alveolar pressure or alveolar wall fragility. When it occurs concomitantly with alveolar hemorrhage, it implies significant disruption of the alveolocapillary barrier. Similar mechanisms have been proposed in herbal supplement-related lung injury, in which oxidative stress, endothelial dysfunction, and immune-mediated injury contribute to alveolar damage and air-leak syndromes^{5,8}. The coexistence of these two findings in our patient, in the absence of alternative etiologies, supports the possibility of direct toxic injury to lung tissue related to *T. terrestris*-associated endothelial and microvascular effects.

It should also be noted that the herbal preparation used by the patient contained multiple components, including Shiitake, Guggul, Schisandra pollen, and propolis. Previous studies have demonstrated that polyherbal formulations may increase the risk of pharmacodynamic synergy, toxic interactions, hepatotoxicity, and immunologic reactions, which may secondarily trigger vasculitic or hemorrhagic pulmonary processes^{5,8,9}. This polyherbal composition complicates definitive causality assessment but further underscores the potential risks associated with unregulated herbal supplement use.

Following the COVID-19 pandemic, the global consumption of herbal supplements for immune support and energy enhancement has increased substantially. Reviews focusing on herbal and dietary supplement safety emphasize that many of these products lack adequate pharmacological standardization, quality control, and post-marketing surveillance, thereby increasing the risk of unexpected systemic and pulmonary adverse effects^{3,10}. **The present case contributes to the existing literature by expanding the spectrum of reported adverse effects associated with *Tribulus terrestris*-containing herbal products and by highlighting the rare coexistence of alveolar hemorrhage and pneumomediastinum as a potential manifestation of**

pulmonary toxicity. This observation emphasizes the importance of carefully questioning herbal supplement use in patients presenting with unexplained hemoptysis or atypical pulmonary findings.

It should be acknowledged that the herbal preparation used by the patient contained multiple components, including *Shiitake*, *Guggul*, *Schisandra pollen*, and *propolis*. Therefore, a definitive causal relationship between *Tribulus terrestris* and the observed pulmonary findings cannot be conclusively established. This represents an important limitation of the present case report. Nevertheless, *Tribulus terrestris* was considered the most likely offending agent due to the close temporal relationship between its ingestion and symptom onset, the exclusion of alternative etiologies, and its previously reported effects on endothelial integrity and microvascular permeability.

In conclusion, this case illustrates a rare but clinically significant pulmonary toxicity potentially associated with *Tribulus terrestris*. Clinicians should maintain a high index of suspicion for herbal supplement-related adverse effects and thoroughly evaluate supplement use in patients presenting with unexplained hemoptysis, alveolar hemorrhage, or pneumomediastinum.

CONCLUSION

Although often perceived as harmless, uncontrolled use of herbal supplements containing *Tribulus terrestris* may lead to serious systemic and pulmonary complications. This case demonstrates the potential association of this herb with rare but life-threatening conditions such as alveolar hemorrhage and pneumomediastinum.

Clinicians should routinely question herbal product use in patients presenting with unexplained hemoptysis, dyspnea, or mediastinal air detected on thoracic CT, as such information may provide important diagnostic clues. Further research is needed regarding the pharmacologic profiles and toxicity mechanisms of herbal supplements, and stricter regulation of their sale and use should be encouraged. This case contributes to the literature by highlighting the unexpected and severe complications that widely used herbal mixtures may cause.

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