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CASE REPORT

Exogenous lipoid pneumonia caused by *Nigella sativa* oil – A case report

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KEYWORDS

Interstitial Lung Disease;
Fibrosis;
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Abstract *Introduction:* Exogenous lipoid pneumonia (ELP) is an uncommon and chronic infiltrative pulmonary process secondary to continued aspiration of exogenous lipids.

Nigella sativa, or the black cumin seed, is a herb used in traditional medicine in many Middle Eastern and Asian countries to treat a broad array of diseases.

Objective: The purpose of the present case report is to reveal the role of the abuse of *N. sativa* seed oil (black cumin seed oil), as an exceptional cause of ELP, which has not been, to our knowledge, previously documented.

Case report: A 50-year-old man was evaluated for a 6-month history of cough, sputum and progressively worsening dyspnea on exertion.

His medical history included long-term smoking. We questioned the patient specifically about use of any traditional herbal medicinal products. He acknowledged that he had been taking one tablespoon (15 ml) of *N. sativa* oil at bedtime since 8 months (8 bottles of 500 ml) for the purposes of tonification. Exogenous lipid pneumonia was suspected.

Physical examination found bilateral crackles of the lung bases. Lung function tests were normal. The chest radiograph showed thoracic distension and bilateral basal interstitial disease. Computed tomography (CT) of the chest was performed, and revealed infiltrative lung disease affecting the posterobasal segments of the right and left lower lobes, honeycomb fibrosis was seen at the bases of both lungs. Routine blood tests were normal. Sputum and blood culture were sterile.

We performed bronchoscopy with transbronchial biopsies and bronchoalveolar lavage. The color of the lavage liquid was bluish with fat globules on the fluid surface. It contained 220,000 cells/ml. Differential cell count showed 87% macrophages, 13% lymphocytes; stains and cultures for infectious agents were negative.

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The patient was advised to stop taking *N. sativa* oil. The only treatment that was instituted was N-acetylcysteine. A clinically significant change in symptoms and chest radiograph was observed. The patient has remained stable 18 months after the diagnosis.

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Introduction

Exogenous Lipoid Pneumonia (ELP) is a rare condition caused by inhalation or aspiration of plant, animal or mineral fats and may take an acute or chronic form. The majority of reported cases are related to the use of paraffin oil as laxative for chronic constipation, or in fire-eaters who use oily substances in their shows. Other lipid preparations for other therapeutic purposes may be involved. ELP has no specific clinical or radiological features. Its diagnosis requires a high degree of diagnostic suspicion. It should be considered each time an acute or chronic pneumonia associated with a history of exposure to a lipid substance occurs. We report here the first case published on exogenous lipid pneumonia secondary to *Nigella sativa* oil consumption in an tonification purpose.

Case report

A 50-year-old man was evaluated for a 6-month history of cough, sputum and progressively worsening dyspnea on exertion.

His medical history included long-term smoking. We questioned the patient specifically about use of any traditional herbal medicinal products. He acknowledged that he had been taking one tablespoon (15 ml) of *N. sativa* oil at bedtime since 8 months (8 bottles of 500 ml) for the purpose of tonification. His history showed no other comorbidities. Exogenous lipid pneumonia was suspected.



Figure 1 Radio thorax face montrant une distension pulmonaire et un discret syndrome interstitiel des bases.

Physical examination found bilateral crackles of the lung bases. Lung function tests were normal. The chest radiograph showed thoracic distension and bilateral basal interstitial disease (Fig. 1). Computed tomography (CT) of the chest was performed, and revealed infiltrative lung disease affecting the posterobasal segments of the right and left lower lobes, honeycomb fibrosis was seen at the bases of both lungs (Fig. 2). Routine blood tests were normal. Sputum and blood culture were sterile.

We performed bronchoscopy with transbronchial biopsies and bronchoalveolar lavage. The color of the lavage liquid was bluish with fat globules on the fluid surface. It contained 220,000 cells/ml. Differential cell count showed 87% macrophages, 13% lymphocytes; stains and cultures for infectious agents were negative.

The histological study of biopsies showed alveolar inflammation predominantly macrophage.

The patient was advised to stop taking *N. sativa* Oil. He received only N-acetylcysteine. Subsequent monitoring objectified clinical and radiological improvement. The patient has remained stable for 18 months after the diagnosis.

We diagnosed this case as Exogenous Lipoid Pneumonia *N. sativa*. We then advised the patient not to consume the oil and quit smoking.

Discussion

First described in 1925 by Laughlen [1], ELP is an uncommon condition caused by inhalation of oils. Acute ELP is secondary to accidental aspiration of a large quantity of lipid material over a short period of time, whereas the chronic form results from longterm recurrent inhalation exposure to oil products [2], such as paraffin oil to treat chronic constipation, as well as nose drops to treat chronic rhinitis. Animal oils are also

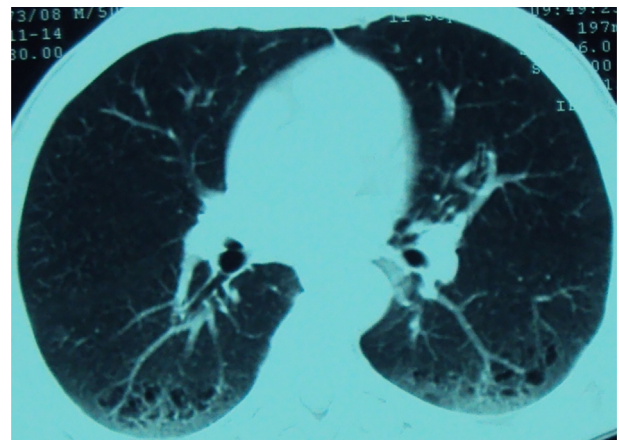


Figure 2 TDM thoracique montrant un discret rayon de miel et des verres dépolis des 2 bases.

implicated, for example cod liver oil is a nutritional supplement in children. Vegetable oils may also be involved as sesame oil is commonly said to balance cholesterol levels. Acute lipid pneumonia is resulting from the massive accidental inhalation of lipid material as is the case with fire-eaters [3].

Other therapeutic oils can cause ELP, our reported case adds to the list—for the first time—*N. sativa* oil which is a vegetable oil. It is also known as black cumin oil, and is appreciated in India for its virtues. It is also a part of traditional Arabic and oriental medicine. It was known and used in Europe until the seventeenth century, when it was gradually abandoned.

Factors that increase the risk of ELP include extremes of age; anatomical or structural abnormalities of the pharynx and esophagus, such as Zenker diverticulum, gastroesophageal fistula, hiatal hernia, gastroesophageal reflux, achalasia; psychiatric disorders; episodes of loss of consciousness; neuromuscular disorders that result in swallowing dysfunction or affect the cough reflex; and, particularly in children, forced oil intake. Because they float on the top of stomach fluids, oils may enter the airway when aspirated by patients with gastroesophageal reflux disease [4]. In many cases there is no predisposing condition and the excessive use of oily substances is the presumed cause. In adults, 25% of cases of lipid pneumonia occur in individuals without any predisposing factors [4]. The case reported in this article had none of the risk factors cited above.

When oils are ingested, they float at the surface of the gastric contents. According to the theory of reflux, the lipid particles go back into the esophagus and pass through the trachea and lead preferentially to the lower lobes.

The pathophysiology of ELP is mainly explained by the general response of the lungs to foreign bodies. Inhaled oil is emulsified and phagocytosed by alveolar macrophages, which, full with oil, join through lymphatic channels of the interlobular septum and stay there. This causes a thickening of the alveolar wall and destruction of certain cells. Gradually, the fibrous proliferation advances and can affect at a later stage more lung territories [5].

Oil ingestion is rarely reported at the time of the first consultation as long as vegetable oil is never considered as a drug, and our reported case is a perfect example. The clinical symptoms are nonspecific, and vary according to the patient's age, duration of oil intake, and the amount and quality of oil aspirated. Symptoms are ranging from asymptomatic to severe, life-threatening disease. When present, symptoms are usually mild. Lipoid pneumonia usually presents with chronic cough, sometimes productive, and dyspnea. Less common problems include chest pain, hemoptysis, weight loss, and intermittent fever. Physical examination of the chest may be normal or may present dullness to percussion, crackles, wheezes, or rhonchi. Most cases of lipid pneumonia show a discrepancy in severity between the radiological and clinical findings [4].

Parenchymal abnormalities depend on type, quantity, frequency and duration of exposure. Mineral oils tend to cause less intense inflammatory reactions. Large and small oil particles can sometimes unite and form large drops of oil surrounded by fibrous tissue and giant cells, creating a nodule or tumor mass (e.g. paraffinome) [6,7].

Massive inhalations of lipid particles can give diffuse parenchymal condensation, giving an appearance of lobar pneumonia. Severe destruction of the architecture of the parenchyma may lead to chronic respiratory insufficiency [5].

High resolution CT is better suited for the lipid pneumonia, it may show alveolar condensation, ground-glass, nodular lesions, thickening of interlobular septa and intralobular cross-links [8–10]. In this case, chest radiography and CT scan showed signs of bilateral basal fibrosis, but they failed to guide the etiological diagnosis.

The diagnosis of exogenous lipid pneumonia is based on a history of exposure to oil with radiological findings in keeping with the disease [11]. The macroscopic appearance of bronchoalveolar lavage (BAL) may suggest diagnosis, revealing a whitish, turbid or bluish fluid (depending on oil components), with fat globules on the fluid surface [12,13]. The presence of lipid-laden macrophages on sputum or bronchoalveolar lavage analysis has been reported but is not always present [14].

Laboratory tests are usually normal. However, there may be a leukocytosis and inflammation signs.

There are currently no studies in the literature that define the best therapeutic option. Elimination of the causative factor is the primary concern. Treatment in patients without clinical symptoms remains controversial.

This case illustrates the importance of considering the diagnosis of ELP in the case of recurrent or chronic symptoms. There is no single clinical feature that is specific for the condition, so the Internist must have a high index of suspicion to consider this diagnosis in patients presenting with undiagnosed chronic cough, dyspnea, or recurrent pulmonary infiltrates on routine imaging studies. ELP should be in the differential diagnosis in a patient with a chronic cough.vv

Conflict of interest

None of the authors has any financial support or relationship that may pose conflicts of interest.

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