Chronic *Klebsiella* Pneumonia in an Immunocompetent Host


**Abstract**

A 55 years immunocompetent male was evaluated for chronic pulmonary disease of over 12-month duration for which he had twice been prescribed anti-tubercular therapy. Investigations led to the diagnosis of chronic *Klebsiella* pneumonia, which is rarely encountered in immunocompetent hosts in the antibiotic era.

**INTRODUCTION**

*Klebsiella* was a well-established, though infrequent, cause of pneumonia in the pre-antibiotic era, accounting for about 1 to 3% of all cases reported at that time. This organism continues to be a rare but well-known cause of community-acquired pneumonia, accounting for 1 to 5% of cases. Two forms of the disease are recognized. The acute form resembles pneumococcal lobar pneumonia except that it occurs almost exclusively in debilitated subjects and has a fulminant course. The chronic form of the disease persists for weeks or months and may be confused with pulmonary tuberculosis. Chronic *Klebsiella* pneumonia was reported, albeit rarely, in the pre-antibiotic era but is almost never seen these days. We describe a middle-aged immunocompetent man with chronic *Klebsiella* pneumonia.

**CASE REPORT**

A 55 years male, a non-diabetic, HIV-negative telephone linesman was referred to our Institute for evaluation of cough and expectoration of over 12-month duration. Cough was associated with daily expectoration of 4-5 teaspoonful of non-foul smelling mucopurulent sputum. For the preceding three months this was accompanied by continuous low-grade fever, decreased appetite and loss of 10 kg of weight. He had smoked 30 pack-years before quitting one year ago. Eleven months prior to referral, he was prescribed anti-tubercular treatment (ATT) in the form of Rifampicin 450 mg, Isoniazid 300 mg, Pyrazinamide 1500 mg and Ethambutol 800 mg once daily on empty stomach. The patient stopped ATT of his own accord after taking for a month, as he felt unwell. Two months prior to referral, he was restarted on ATT (Rifampicin 450 mg, Isoniazid 300 mg, Pyrazinamide 1500 mg and Ethambutol 800 mg once daily on empty stomach), which he discontinued again after taking for a month, as he once again felt unwell. To our knowledge, the patient had not received any course of antibiotics. General physical examination detected pallor and marked clubbing. Respiratory system examination was unremarkable.

The haemogram recorded a hemoglobin level of 8.6 gm/
The total leucocytic count (TLC) was 19,500 per cubic mm, with 87% polymorphs, and 13% lymphocytes with an ESR of 60 mm. The peripheral smear demonstrated anisocytosis with microcytic hypochromic red blood cells. The Mantoux test as well as stains and culture for *Mycobacterium tuberculosis* were negative. He was started on oral co-amoxyclav (625 mg eight hourly) and metronidazole (400 mg eight hourly) immediately after sending sputum for Gram stain and aerobic culture. Gram stain demonstrated abundant Gram-negative bacilli.

*Klebsiella pneumoniae* was isolated in sputum culture as pure growth in both the initial samples. The antibiotics were stopped and sputum specimens were sent after 48 hours. These yielded moderate growth of *K. pneumoniae*.

A review of three chest skiagrams, done over the year prior to referral, showed a non-homogeneous opacity occupying the posterior segment of the right upper lobe and the superior segment of the right lower lobe with multiple areas of breakdown. Chest skiagrams (Figs. 1a and 1b) done at presentation showed an increase in the lesion. Bronchoscopy, done after commencement of antibiotics, visualized mucous plugs in right middle lobe bronchus. Bronchial aspirate smear showed benign epithelial cells and many macrophages with no acid-fast bacillus (AFB) or malignant cells. Aerobic culture did not grow any organism. Transbronchial biopsy displayed fibrosis and mononuclear inflammatory cell infiltrate within septae.

A contrast-enhanced computed tomography (CT) (Fig. 2) demonstrated a large area of consolidation composed of enhancing homogeneous areas and poorly marginated hypodense areas in the right lung located posteriorly involving both upper and lower lobes. Multiple pockets of air, resembling micro-abscesses and a large cavity were present within the consolidation. The CT guided FNAC was reported as acute non-specific inflammation. Stains for *M. tuberculosis* were negative and no malignant cells were seen.

Aerobic and anaerobic cultures did not yield organism.

A diagnosis of chronic *Klebsiella* pneumonia was made and the antimicrobial therapy was modified to oral cefuroxime (750 mg 12 hourly), parenteral gentamicin (80 mg 12 hourly) and oral co-amoxyclav (625 mg eight hourly). Marked symptomatic improvement was noted within 10 days and the patient was symptom-free after six weeks. The hemoglobin increased to 10.2 gm/dL and the TLC became 8,600 per cubic mm, with 70% polymorphs and 30% lymphocytes. Chest skiagram done at four weeks did not show much change. Antibiotics were continued for a period of 12 weeks. Chest skiagram done five months later showed marked reduction in the size of the lesion but the one done after eight months (Fig. 3) demonstrated almost complete clearing of the lesion with some residual fibrosis.

**DISCUSSION**

*Klebsiella pneumoniae* is an uncommon cause of acute community-acquired pneumonia but the chronic form is rarely encountered and even less thought of Solomon,1 in a review of 17 patients in the pre-antibiotic era, found that chronic *Klebsiella* pneumonia occurred almost exclusively in the later decades, predominantly in males, especially those affected by alcoholism. In 14 patients, the onset was acute during the early stages the patients were severely ill. Gradually the illness became chronic and had a protracted but a relatively benign
lobe and superior segment of the right lower lobe are also frequently affected. The chest skagrams of our patient showed non-homogeneous consolidation of the posterior segment of the upper lobe and superior segment of the lower lobe of the right lung. Multiple areas of breakdown with downward displacement of the superior part of major fissure were also seen. These features are similar to the radiological descriptions in the previous reports. There was a gradual increase in the size of the lesion, providing evidence for the indolent nature of the disease.

Recently, Moon and colleagues evaluated the CT findings in 11 patients with complications of acute Klebsiella pneumonia. Pneumonic consolidation in all the patient comprised two intermingled components viz. enhancing homogeneous areas and low-density areas with poorly defined margins along with multiple small air cavities, which were seen in our patient.

There is a remarkable clinical and radiological similarity between chronic Klebsiella pneumonia and pulmonary tuberculosis. This has important clinical implications in India as patients with chronic Klebsiella pneumonia may be prescribed ATT repeatedly as it happened in our case. A high index of suspicion is necessary for diagnosis and chronic Klebsiella pneumonia should be considered in all cases with negative sputum smears and unresponsive to ATT.

Fig. 3: Chest skigram done after eight months showing almost complete clearing of the lesion with some residual fibrosis.

Although there are no characteristic radiological features, chronic Klebsiella pneumonia almost always presents with cavitation in the upper lobes predominantly on the right side, which is also commonly seen in pulmonary tuberculosis. The posterior segment of the right upper lobe was consolidated in most cases. The adjacent apical segment of the right upper lobe and superior segment of the right lower lobe are also frequently affected. The chest skagrams of our patient showed non-homogeneous consolidation of the posterior segment of the upper lobe and superior segment of the lower lobe of the right lung. Multiple areas of breakdown with downward displacement of the superior part of major fissure were also seen. These features are similar to the radiological descriptions in the previous reports. There was a gradual increase in the size of the lesion, providing evidence for the indolent nature of the disease.

Recently, Moon and colleagues evaluated the CT findings in 11 patients with complications of acute Klebsiella pneumonia. Pneumonic consolidation in all the patient comprised two intermingled components viz. enhancing homogeneous areas and low-density areas with poorly defined margins along with multiple small air cavities, which were seen in our patient.

There is a remarkable clinical and radiological similarity between chronic Klebsiella pneumonia and pulmonary tuberculosis. This has important clinical implications in India as patients with chronic Klebsiella pneumonia may be prescribed ATT repeatedly as it happened in our case. A high index of suspicion is necessary for diagnosis and chronic Klebsiella pneumonia should be considered in all cases with negative sputum smears and unresponsive to ATT.

Fig. 3: Chest skigram done after eight months showing almost complete clearing of the lesion with some residual fibrosis.

References