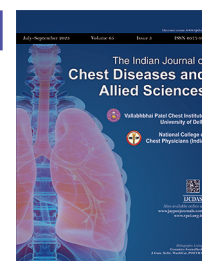


CASE REPORT

Bronchopulmonary Infection by *Lophomonas blattarum*: A Case Report from South India

Vithiya Ganesan 

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ABSTRACT

Aim and background: *Lophomonas blattarum*, a new flagellate protozoan has been implicated in bronchopulmonary infections. Since the 1990s, reports emerged from peoples Republic of China, followed by reports from other parts of the world too. Six cases have been reported from India so far. To the best of our knowledge, this is the first case report from South India.

Case description: A 68-year-old female was hospitalized with symptoms of lower respiratory infection. Computed tomography (CT) thorax showed consolidation with cavitation and centrilobular nodules in the left upper lobe. Sputum Gram, Ziehl–Neilsen stain and bacterial culture did not reveal any etiology. Wet mount of broncho alveolar lavage revealed actively motile organisms with a polar tuft of flagella identified as *L. blattarum*. She was treated with intravenous metronidazole for a week and oral metronidazole 400 mg thrice daily for the next 3 weeks. The patient was symptomatically better after 2 months of follow-up.

Conclusion: Parasites are deterred as a significant etiology of respiratory tract infections, and perception of *L. blattarum* builds a new element to this assumption. Through this report, we hope to raise awareness among the medical community about this emerging infection and consider it in differential diagnosis in appropriate case settings.

Clinical significance:

- *Lophomonas blattarum* is an unconventional and unusual pathogen causing bronchopulmonary infections.
- It can be easily missed if not looked for.

Keywords: Bronchoalveolar lavage, Case report, *Lophomonas blattarum*, Metronidazole.

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ABBREVIATIONS USED IN THIS ARTICLE

ATT = Antituberculous therapy; BAL = Bronchoalveolar lavage; BP = Blood pressure; CAD = Coronary artery disease; CT = Computed tomography; DM = Diabetes mellitus; MDR = Multidrug resistant; MTB = *Mycobacterium tuberculosis*; MGIT = Mycobacteria growth indicator tube; PCR = Polymerase chain reaction; RIF = Rifampicin; TB = Tuberculosis.

INTRODUCTION

Lophomonas blattarum is a new flagellate protozoan parasite with a possible role in bronchopulmonary infections. It was initially described as a commensal in the gut of cockroaches.¹ Since the 1990s, reports emerged from peoples Republic of China, followed by reports from other parts of the world too.^{1–3} Five cases have been reported from India so far.^{3–8} To the best of our knowledge, this is the first case report from South India.

CASE DESCRIPTION

A 68-year-old female was hospitalized with a cough for 3 weeks; vomiting and dysuria for 3 days. She also reported left-sided chest pain which was aggravated by deep inspiration. She was admitted twice in the recent 3 months elsewhere and treatment details were not known. She was a known diabetic, hypertensive, and coronary artery disease and was on regular treatment. On physical examination, the patient was afebrile and poorly

Department of Microbiology, Velammal Medical College Hospital and Research Institute, Madurai, Tamil Nadu, India

Corresponding Author: Vithiya Ganesan, Department of Microbiology, Velammal Medical College Hospital and Research Institute, Madurai, Tamil Nadu, India, Phone: +91 9486312483, e-mail: vidhya.md@gmail.com

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built; chest wall tenderness was noted. Blood pressure (BP) was 110/60 mm Hg, pulse 110/minute, respiratory rate 22/minute, and SpO₂ was 97% in room air. Hemogram showed an elevated total count 17,900 cells/mm³; low hemoglobin (9.2 gm/dL); and normal eosinophils. Blood sugar was elevated (294 mg/dL), and urea levels (75 mg/dL) were high with raised alkaline phosphatase (156 U/L) and raised procalcitonin (71.20 ng/mL). Sodium and chloride were low, 128 and 89 mmol/L, respectively. Chest X-ray revealed a homogenous opacity in the left mid-zone lung. Computerized tomography (CT) thorax showed consolidation with cavitation and surrounding ground glass opacity with

centrilobular nodules in apicoposterior segment of the left upper lobe. Small-volume lymph nodes were noted in the mediastinum. Empirical ceftriaxone for presumed bacterial pneumonia showed no approving response. Hence, a bronchoscopy was done, and a bronchial wash was sent for laboratory analysis. Gram and Ziehl Neilsen stain did not reveal any organism. Real-time polymerase chain reaction (PCR) for *Mycobacterium tuberculosis* (MTB) by Truenat MTB Plus was negative. Wet mount of bronchoalveolar lavage (BAL) revealed actively motile organisms with a polar tuft of flagella lashing to-and-fro motility (Fig. 1; Supplementary Video 1). The pear-shaped trophozoite with granular cytoplasm, outer flagella of the tuft vibrating freely in the surrounding fluid medium was identified as *L. blattarum*. She was treated with intravenous metronidazole for 1 week and oral metronidazole 400 mg thrice daily for the next 3 weeks. On follow-up after 2 months, the patient was symptomatically better.

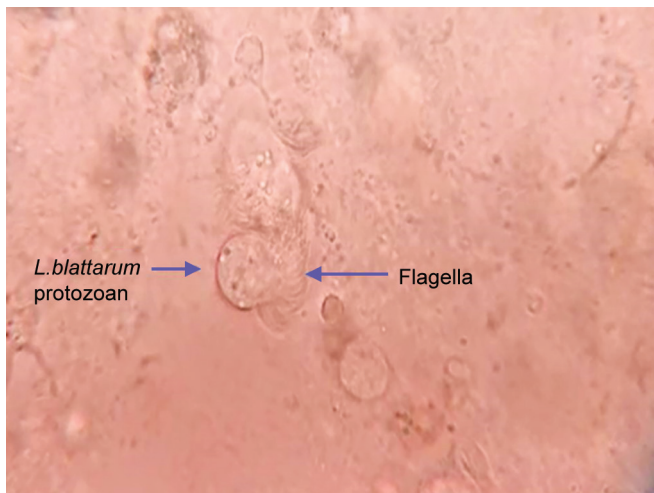


Fig. 1: Flagellate *L. blattarum* protozoan observed under light microscope (40 × 10) in a wet mount of bronchoalveolar fluid

DISCUSSION

Lophomonas blattarum, a multiflagellated protozoan belonging to suborder *Lophomonadidae* is a commensal parasite in the gut of cockroaches.⁸ It can be plausibly inferred that the parasite excreted through insect feces can survive in the external environment as a cystic form for diverse periods. Consequently, anyone breathing the dust containing *L. blattarum* could be conveniently infected. In the human host, excystation ensues and the emancipated trophozoites instigate the infection. Immunosuppression in any shape is a cardinal risk factor. Considering the mode of entry by inhalation, the bronchopulmonary site is most typically infected. Distinct eosinophilia is not a sustained finding, in light of immunosuppression perceived in most patients. Undistinguished symptoms are analogous to other respiratory conditions. The definitive diagnosis of *Lophomonas* infection counts massively on conventional light microscopy. Of late, molecular methods in the diagnosis of *Lophomonas* infection have addressed a salient hiatus in diagnostic criteria.⁹ Almost all patients treated with metronidazole or tinidazole had a good prognosis. In a recent systematic review of 307 cases reported between 1993 and 2020, 171 (55.7%) cases were reported in ages below 18 years.¹⁰ The majority of cases ($n = 237$) were reported from Iran. Bronchoalveolar lavage specimen ($n = 269$; 87.6%) was the most commonly used to diagnose lophomoniasis. The majority (63.8%; $n = 196$) of cases had no remarkable underlying illness. Six cases have been reported from India so far. Table 1 shows the demography, clinical presentation, comorbidities, radiographic findings, treatment, and outcome of the cases. There was no age or gender preponderance. Three cases with concurrent pulmonary tuberculosis (TB) had left upper lobe consolidation. All but one case (treated with diethylcarbamazine) was cured with metronidazole.

CONCLUSION

Parasites are deterred as a significant etiology of respiratory tract infections, and the perception of *L. blattarum* builds a new element to this assumption. Respiratory tract infections in immunocompromised

Table 1: Review of six cases reported from India

Studies from India	Age/sex	Clinical presentation	Comorbidity	Radiographic findings	Parasite appreciated in sample type	Treatment	Outcome
Verma et al. ³	60/M	Fever, worsening cough and dyspnea	Pulmonary TB confirmed by Xpert MTB/RIF a month ago and under treatment	CT chest revealed consolidation, bronchiectasis, cavitation, and nodular opacity within the left upper lobe	BAL fluid	Oral metronidazole 400 mg thrice daily for 1 week and Concurrent ATT	Cured
Singh and Madan ⁴	55/F	Cough with purulent expectoration, chest pain for 1 week	DM for 5 years and treated for tuberculous pleural effusion 3 years back	CT chest irregular cavitating speculated lesion in apicoposterior segment of left upper lobe	BAL fluid. Concurrently acid-fast bacilli also demonstrated in BAL	Oral metronidazole 400 mg thrice daily for 10 days	Cured
Tyagi et al. ⁵	23/M	Cough with purulent expectoration, breathlessness on exertion, and low-grade fever of 3 weeks	None	CT chest: No abnormal findings	BAL fluid	Oral metronidazole 400 mg thrice daily was given for 2 weeks	Cured

(Contd...)

Table 1: (Contd...)

Studies from India	Age/sex	Clinical presentation	Comorbidity	Radiographic findings	Parasite appreciated in sample type	Treatment	Outcome
Thakur et al. ⁶	34/F	Fever (intermittent), cough with expectoration and acute exertional dyspnea for 15–20 days with one episode of hemoptysis	History of TB and had completed a full course of anti-TB treatment (category I) 5 years earlier	Chest X-ray showed ill-defined opacities in the left upper and middle zone	BAL fluid (BALF) culture in MGIT was found to be positive for MTB. On Xpert MTB and line probe assay found to be MDR-TB	Oral metronidazole 400 mg thrice daily was given for 2 weeks and Category IV regimen for her MDR-TB	Cured
Gautam ⁷	66/M	Cough with purulent expectoration	Bronchial asthma, allergic bronchitis, and rhinosinusitis	Not available	Sputum	Tablet tinidazole for 1 month. With no improvement, tablet diethylcarbamazine initiated	Cured
Keche et al. ⁸	45/M	Productive cough, fever for 1 week, and chest pain	None	X-ray chest – cavitory lesion in the left lung CT chest – subsegmental consolidation, septal thickening, and ground-glass opacity. A large cavity 5 × 6 cm in the left lobe with mild left pleural effusion	BAL	Oral metronidazole 400 mg thrice daily for 2 weeks	Cured
Present case	68/F	Cough with minimal expectoration for 3 weeks	DM/CAD	CT chest – left upper lobe consolidation	BAL	Intravenous metronidazole	Cured

ATT, antituberculous therapy; BAL, bronchoalveolar lavage; CAD, coronary artery disease; CT, computerized tomography; DM, diabetes mellitus, MDR, multidrug resistant; MGIT, mycobacteria growth indicator tube; MTB/RIF, *Mycobacterium tuberculosis/rifampicin*; TB, tuberculosis

individuals may be due to innumerable microbes, therefore, it is pertinent to contemplate other conventional pathogens before settling on a conclusive diagnosis. In cases with the obvious likelihood of coinfection, response to antiparasitic agents can help in resolving the pathogenic role of this parasite. The same can be applied in instances where discernment from masquerades such as ciliocytophthoria presents a problem. Also, the development of molecular tests will pave the way for the confirmation of microscopic diagnosis. Through this report, we hope to raise awareness among the medical community about this emerging infection and consider it in differential diagnosis in appropriate case settings.

Clinical Significance

- *Lophomonas blattarum* is an unconventional and unusual pathogen causing bronchopulmonary infections.
- It can be easily missed if not looked for.

SUPPLEMENTARY MATERIALS

All the supplementary materials are available online on the website of <https://www.ijcdas.com/journalDetails/IJCDAS>.

ORCID

Vithiya Ganesan  <https://orcid.org/0000-0003-0949-2841>

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