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Case Report

An unusual case of human paragonimiasis

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Introduction

Human paragonimiasis is caused by the *Paragonimus* species of lung flukes. These are widely distributed worldwide including East and Southeast Asia. The first ever case of paragonimiasis was reported by Kerbert from the lungs of a Bengal tiger more than a century ago.¹ In India the first case was reported from Manipur in 1982. Subsequently, endemic foci of *Paragonimus westermani* and *Paragonimus heterotremus* have been reported from Manipur, Nagaland, Arunachal Pradesh, Bengal and Assam.^{1,2} Human infection primarily results from consumption of raw or undercooked, pickled, brine soaked crabs, crayfish and shrimps harboring the infective form.³ Paragonimiasis in India often mimics pulmonary tuberculosis.^{4,5}

Case Report

24-year old male patient, resident of Kerala, reported with complaints of mild fever and cough with brownish expectoration streaked with blood of three days duration. He had no past history suggestive of pulmonary tuberculosis or any history of eating raw crabs or shrimps. On performing Ziehl–Neelsen (ZN) staining no acid-fast bacilli were detected in the sputum. Oval acid-fast structures measuring about 50–70 μ were seen. On wet mount preparation of the sputum golden brown oval flat operculated eggs were visualized (Fig. 1). Patient's stool examination by the concentration method showed similar eggs. Hematological examination demonstrated raised total leukocyte count with eosinophilia. Plain chest radiograph and MRI of brain was normal. He was diagnosed as a case of paragonimiasis and treated with Praziquantel 75 mg/kg/day in three divided doses for 3 days. The patient became asymptomatic and was placed on periodic medical review.

Discussion

The adult trematode, resides in the lungs of wild and domestic mammals including humans. The eggs are coughed up in sputum or swallowed and then excreted in feces. In water the eggs develop into miracidia and penetrate a snail host. The miracidia multiply and develop into cercariae and enter the second intermediate host namely crabs, crayfish and shrimps. The encystments of the cercariae takes place in the tissues and this infective metacercariae enter the final mammalian

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Fig. 1 – Operculated egg of *Paragonimus* spp in sputum sample. In the background epithelial cells can be seen.

host. The parasite excysts, penetrates the intestinal wall and reaches the lungs or other ectopic sites like brain, abdomen, skin and heart to develop into an adult worm. An adult worm may live up to 20 years.³

Human infection primarily results from consumption of raw or undercooked, pickled, or brine soaked crabs, crayfish and shrimps harboring the infective form. *Potamiscus manipurensis*, *Alcomon superciliosum* and *Maydellia thelphusa lugubris* have been identified as the crab hosts of *Paragonimus* in India. In countries with high prevalence rates like China, Korea and Philippines raw crab juices are thought to have medicinal properties for enhancing fertility and treatment of measles. In India, endemic foci have been reported in Manipur and Nagaland though eating raw food is not a widespread practice there.^{1–4} *Paragonimus* infection could also result from ingestion of cooked food contaminated by hands or utensils. Alternatively transmission may occur by eating pigs and other wild animals harboring the infective metacercariae.³

The migratory route of the larva and the tissue of lodgment are the primary sites of pathology caused by the host inflammatory response to the eggs, larvae and the mature parasite. The lesions are granulomatous beginning with infiltrating leukocytosis (mainly eosinophil), cyst formation and final calcification. The inflammatory response later subsides due to modulation of the host immune response.³

The patient generally presents with chronic productive cough. Sputum is brownish that contain streaks of blood and parasite eggs. Chest pain and night sweats mimicking pulmonary tuberculosis, bronchiectasis and bronchopneumonia unresponsive to antibiotics may occur. Cerebral paragonimiasis may present with eosinophilic meningitis of insidious onset in conjunction with pulmonary signs. Mortality has been reported due to fulminant abscesses in the heart or abdominal cavity.³

Eggs of the *Paragonimus* may be demonstrated in the sputum, stool, tissues and other specimens. In children and elderly subjects the concentration technique may reveal the eggs in the stool. Skin tests and immunodiagnostic methods are useful for surveys. The antibody titer rapidly decline and

ELISA tests are useful to determine a cure in chronic infections. Plain radiography and computed tomography usually reveal a nodular or ring shadow or patchy infiltration and cavities in the lungs. In eosinophilic meningitis a characteristic soap bubble appearance of the dilated ventricles in computed tomography is diagnostic.³

Praziquantel, the drug of choice with a course of 3×25 mg/kg body weight for 3 days is effective. Other drugs used are bithionol and triclabendazole have also been used with success.³ The prevention of paragonimiasis is by eliminating the intermediate host and to avoid eating of raw or incompletely cooked crabs and crayfish.

Our patient is a young native of Kerala without any predisposing conditions for paragonimiasis. Although he presented with cough and hemoptysis, he was otherwise healthy and able to carry out day-to-day activities of a medical intern. Eosinophilia was recorded in this case but plain radiograph of the chest was normal. He did not volunteer any history of recent or past travel to northeastern region of India or abroad endemic for paragonimiasis.

As in the majority of other case, in our case too the primary suspicion was pulmonary tuberculosis. The diagnosis of paragonimiasis is often made while investigating for pulmonary tuberculosis or other respiratory infections. Unfamiliarity with the disease results in misdiagnosis although the signs and symptoms along with the dietary history and residence in an endemic area are pathognomonic. Many cases of paragonimiasis are treated as smear negative pulmonary tuberculosis.³

Most of the cases of paragonimiasis have been reported from the eastern and northeastern states of India.⁶ It is uncommon in the southern and western parts of India. Therefore, it is essential that parasitic infestations be ruled out in all cases presenting with productive cough and hemoptysis. Similarly, cases being treated for smear negative tuberculosis must be reviewed for paragonimiasis depending upon the endemicity and dietary habits.

Singh et al⁷ in their recent review of 2012 assert that the prevalence of this parasitic infestation could be wider in India since only the north eastern states have been investigated. Though serological techniques like ELISA are useful for epidemiological purposes, the exact speciation of *Paragonimus* can be rightfully undertaken by molecular characterization of the genomic DNA of the parasite. In our case study, we report the case as human paragonimiasis as we were unable to establish exact species of the parasite. Also, this is a case from Kerala, South India where paragonimiasis is a rarity.

Conflicts of interest

All authors have none to declare.

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