Pleuropulmonary paragonimiasis: mimicker of tuberculosis

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Infection caused by the lung fluke is endemic in north eastern parts of India. *Paragonimus westermani* and *Paragonimus heterotremus* are known to be endemic in eastern Indian states of Manipur and Nagaland. The infection is related to eating habits of the locals and is acquired by ingestion of raw, inadequately cooked crabs or crayfish containing encysted metacercariae which act as second intermediate hosts during the life cycle of the lung fluke. Diagnosis is generally delayed due to lack of suspicion and presentation similar to tuberculosis which is endemic in the population. We report pleuropulmonary paragonimiasis in a soldier from eastern India who presented with chest pain, haemoptysis, and eosinophilia. He gave history of consumption of raw crabs while on leave at his native village in Nagaland. Ova morphologically resembling *Paragonimus heterotremus* were detected in sputum and bronchoalveolar lavage specimen. Symptoms resolved with praziquantel treatment.

Keywords: Haemoptysis, Lung fluke, Operculated ova, Paragonimus

Introduction

Infection caused by the lung fluke is endemic in north eastern states of India.¹

Paragonimus westermani and *Paragonimus heterotremus* are known to be endemic in eastern states of Manipur and Nagaland.² The infection is related to eating habits of the locals and is acquired by ingestion of raw, inadequately cooked crabs or crayfish containing encysted metacercariae which act as second intermediate hosts during the life cycle of the fluke.³ Diagnosis is generally delayed due to lack of suspicion and presentation similar to tuberculosis (TB) which is endemic in the population.

We report pleuropulmonary paragonimiasis in a soldier from Nagaland who presented with chest pain, haemoptysis, and eosinophilia. He gave history of consumption of raw crabs while on leave at his native village in Nagaland. Ova morphologically resembling *Paragonimus heterotremus* were detected in sputum and bronchoalveolar lavage specimen. Symptoms resolved with praziquantel treatment.

A 34-year-old soldier was admitted in February 2011 with complaints of chest pain, and after initial evaluation, he was discharged as myalgia chest. A month later, he was readmitted with an allergic skin rash. He was found to be febrile and blood examination revealed eosinophilia. He was diagnosed

as a case of hypereosinophilic syndrome and evaluated further. One year after onset of symptoms, he started having bouts of haemoptysis, dyspnoea, and cough. A chest radiograph (Fig. 1) showed bilateral pleural thickening and cardiomegaly. Computed tomography scan of chest (Fig. 2) revealed bilateral pleural effusions and patchy consolidation in posterior basal segment of right lower lobe of lung. Multiple pleural based soft tissue density lesions were seen in the basal segments of both lungs. Bone marrow examination revealed eosinophilia. Sputum samples were negative for *Mycobacterium tuberculosis* on smear examination and cultures. On detail history taking about his eating habits, it was disclosed that he had consumed raw crabs 4–5 years back during the meat eating festival while on leave at his native village. Differential diagnosis of paragonimiasis was revised after exclusion of TB. Sputum and bronchoalveolar lavage was sent for examination of parasitic ova/cysts. The sputum on naked eye examination was found to be viscous, tinged with brownish flecks, and blood streaked. A wet mount and iodine mount preparation demonstrated *Paragonimus* ova (Fig. 3). The ova were ovoid, thick shelled, yellow brown measuring 100 × 50 µm. They were operculated at the broader end and distinctly thickened at the aboperculated end. The eggs were preserved in equal volume of 10% phosphate-buffered saline. He was treated with praziquantel 25 mg/kg thrice a day for 2 days. Subsequent sputum samples showed clearance of the ova from sputum after 1 week.

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Figure 1 Chest radiograph showing bilateral pleural thickening and cardiomegaly.

Discussion

Paragonimus infection is endemic in northeastern states of India. This epidemiological association has a deep rooted link with the traditions and beliefs of the local native tribal population. The practice of eating raw crabs and crustaceans prevalent in Nagaland is important for transmission of the parasite. The larva must pass through two intermediate hosts, snails and crustaceans to complete its life cycle. Studies reveal that pulmonary symptoms develop 6 months (range: 1–27 months) after ingestion.⁴ It is interesting to note that our patient developed pulmonary symptoms 4 years after consumption of raw crabs which has not been reported. The chest pain was due to piercing of the pleura by the migrating larvae. The signs and symptoms seen in pleuropulmonary paragonimiasis result from early migration of metacercariae from the small intestine to the lung.⁵ They develop into adults and move into the lungs, typically in pairs and stimulate formation of a capsule within which they live, and these were noted as soft tissue lesions on computed tomography scan. Our patient also developed a migratory allergic skin rash which is part of

Figure 2 CT Scan of chest showing multiple pleural based soft tissue nodular lesions.

Figure 3 *Paragonimus* ova found in sputum; eggs are golden yellow, 80 µm in length and 40-50 µm in width having a characteristic flat-shouldered operculum.

extrapulmonary manifestation similar to those seen with cutaneous larva migrans.

The species identification is based on morphology of the eggs and confirmation by molecular characterization.⁶ Reports of *Paragonimus heterotremus* infection from Nagaland, Manipur lead us to conclude that it may be this species in our case. However, *Paragonimus westermani* needs exclusion by molecular characterization.⁷ The clinical findings in paragonimiasis could resemble those of pneumonia, bronchitis, bronchiectasis, pleuropulmonary TB, epilepsy or cerebral space occupying lesion.⁸ Patients may be labelled as smear-negative pulmonary TB resulting in delayed diagnosis and treatment for paragonimiasis. A high index of suspicion should alert to a diagnosis of paragonimiasis as in our case which helped to diagnose this patient. This case also highlights the importance of diagnosing diseases of regional endemicity. Knowledge of prevalent local customs and dietary habits can give an insight to the diagnosis as it did in our patient. Prevention and control of such infections needs educational interventions which focus on preventing contamination of water sources, proper preservation, and cooking of food. Health care workers should educate patients from endemic regions about the risks associated with ingesting raw crustaceans.⁹

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