Unlocking Paragonimiasis: A Case Report from Civil Hospital Aizawl, Mizoram with Clinical and Parasitological Correlation

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Abstract

Paragonimiasis is a significant food borne parasitic zoonosis in India. In Mizoram, there is not much data regarding this infestation, though the people of the hills have a specific delicacy of eating undercooked crabs and fresh water crustaceans. We present a case of a girl with such specific dietary habit with persistent haemoptysis and tuberculosis mimics. We also approached this case with proper clinical acumen and confirmed it with wet mount smears of sputum in microscopy and ELISA. Patient was well treated with praziquantel and recovered well. Awareness is to be set in the mind of clinician and people alike regarding this notorious parasite.

Introduction

Paragonimiasis is a parasitic infestation caused by genus Paragonimus which mimicks pulmonary tuberculosis and requires differentiation from the same in tuberculosis endemic country [1–4]. Paragonimus westermani, the most common species in Asia, was first described by Kerbert from the lungs of a Bengal tiger, which was captured in India and died at a zoo in Amsterdam more than a century ago. There was very little concern about this disease in Mizoram until recently a series of cases mimicking tuberculosis and other respiratory conditions like pneumonia, lung abscess, pleural effusion have come to our notice in our wards and outpatient department. In the areas where people eat undercooked crab/crayfish, this disease should be considered as the differential diagnosis to avoid anti-tubercular treatment for non-tubercular conditions [3, 4]. Here we present the first case we have diagnosed and confirmed and given curative treatment for paragonimiasis.

Case presentation

A ten year old female residing in a remote village in a hilly area, was apparently asymptomatic 1 week before admission to the hospital. She had developed cough, which was acute and non productive initially, there were no aggravating or relieving factors, no diurnal variations. She developed hemoptysis, several episodes which contained frank, bright red blood, post tussive and a cupful in amount which required frequent blood transfusion. There was no history of fever, chest pain or difficulty in breathing.

In the year 2012 when she was 4 years old, she was diagnosed to have pulmonary tuberculosis and received anti tubercular treatment for 6 months (completed treatment). In the year 2017, she had pneumonia and was treated in Civil Hospital Aizawl following which she was again diagnosed with pulmonary Koch's and again received full course of ATT. Following year in 2018, she developed cough with fever and was diagnosed as a case of lung abscess and was managed at CHA and was symptom free after treatment for 2 months.
She was also diagnosed with hypothyroidism (13th Feb 2018) after which she took thyroxine for 3 months but abruptly stopped due to financial constraints. Patient was fully immunised as per age. There was no history of any developmental delay. On careful questioning, it was found she had calorie and protein deficit in her diet and history of frequent intake of smoked fish, prawns and crabs was observed.

At the time of examination, child was conscious, alert, sitting in a comfortable position, pale looking with no cyanosis, icterus, clubbing or lymphadenopathy. Cretin facies with stunting was noted. Vitals were stable. Her weight was 20kg against expected 32.5kg (below 3rd percentile), height being 114cm against expected 137cm (which was also below 3rd percentile).

On examination of respiratory system no abnormality of upper respiratory tract seen. On inspection, respiration was thoracic with regular and symmetrical movement of chest wall, no intercostal or subcostal recession, no use of accessory muscles of respiration. There were no deformities of chest wall or vertebrae. On palpation, trachea was

in midline .There was symmetrical chest expansion with no chest tenderness, vocal fremitus was normal in all the regions of chest wall. On percussion, note was resonant in all regions of chest wall. On auscultation, vesicular breath sounds heard, no adventitious sounds noted. Other systemic examination was found to be within normal limits.

Investigation and outcomes

She received blood transfusion at admission with a haemoglobin of 6 g/dl, there was no thrombocytopenia, total neutrophil count 5500, absolute eosinophil count 110 per cmm, anaemia was microcytic hypochromic type, coagulogram was normal, ESR was 55 mm. Sputum samples repeated for AFB were found to be normal. Stool examination yielded no eggs or ova. Thyroid profile was deranged with a very high TSH and prompt treatment was given. Sputum samples sent for CBNAAT were negative.

Skiagram chest revealed patchy consolidation of left hemithorax usually of the left lower zone which were compared against previous x-rays done. CT chest corroborated the same findings in chest x-ray. CT chest was compared with previous CT done when she was dignosed (in the year 2018) with a left lung abscess close to hilum. USG Chest showed a hypoechoic mass (2.24 x 1.91 x 2.59 cms), 5.8cc volume with peripheral feeder vessel in lateral aspect of left medial lobe of lung. Upper GI endoscopy showed eroded patches near gastroesophageal junction.

Finally taking history, examination and investigations into account, sputum for microscopy with wet mount smears were taken on a repeated basis which revealed metacercariae of paragonimus. Serological testing for confirmation with ELISA was found to be positive.

Treatment was started with Praziquantel 25 mg/kg body weight three times daily for 3 days and child improved. Repeat skiagram on follow up visits showed clearing of lesion with remarkable symptomatic improvement.

Discussion

Paragonimiasis is an important food-borne parasitic zoonosis caused by one or more of the trematode species of the genus Paragonimus [1, 2]. Paragonimiasis is a disease which is frequently misdiagnosed as pulmonary tuberculosis usually when patient present with hemoptysis especially in the endemic region where both disease coexist [3, 4].

The parasites utilize two intermediate hosts and a definitive hosts like wild mammals and humans to complete its lifecycle. First intermediate hosts are the fresh water molluscan species and the second intermediate hosts are the fresh water crab species [6]. Life cycle begins with the production and passage of fertilized, operculate eggs from sexually competent adult trematodes that reside within the lungs of definitive mammalian host. The eggs are expectorated and either expelled or swallowed and passed in the faeces. The eggs in fresh or brackish water eventually hatch and release a ciliated miracidium which invades the first intermediate host (snail) [7].

Parasite develops in snail to form cercaria which leaves the snail and invade the second intermediate host (crustaceans). Cercaria develops into infective stage called metacercaria [4, 5]. Definitive hosts like humans get infected by consumption of raw, undercooked, or alcohol-pickled fresh water crabs or crayfish harbouring the viable metacercaria (infective stage) of Paragonimus species [5]. In definite hosts, the metacercaria excyst in the duodenum and migrate to the lungs to mature into adult worms that produce eggs. The unembryonated eggs erode the bronchial wall and lead to cough and sputum production laden with eggs or if swallowed pass through stool [8, 9].
Thus, the life cycle continues.

A definitive diagnosis of paragonimiasis can be made by finding characteristic golden brown, ellipsoidal or oval operculated Paragonimus ova in the clinical specimens such as sputum, aspirated fluids and faeces by microscopy but it is difficult to make a diagnosis of paragonimiasis by microscopy.

Although, the presence of ova in expectorated sputum is specific, the sensitivity of this test is low (28–38%) and repeated sputum sample examinations may increase the sensitivity of the test [4, 10]. Stool examination is also insensitive and the ova are not usually found in pleural fluid [4, 11]. Serological testing for antiparagonimus antibody by enzyme-linked immunosorbentassay (ELISA) has a sensitivity of 100% and a specificity of 91–100% [12]. It is a useful test for establishing the diagnosis of paragonimaisis. However it is not available in the state of

Mizoram, so samples were sent to Naga hospital authority from the Department of Pathology, Civil Hospital Mizoram for confirmation.

Eosinophilia in peripheral blood smear is a supporting evidence[6], though our patient did not have eosinophilia. Praziquantel at a dose of 75mg/kg/day for 3 days is the drug of choice for paragonimiasis. However, another course of praziquantel is required in patients with unsatisfactory responses, persistent symptoms, or pulmonary involvement [13]. Clinically, paragonimiasis may be broadly classified into pulmonary, extra-pulmonary and pleuropulmonary forms [7]. Pulmonary paragonimiasis is the commonest clinical form of paragonimiasis occurring in 76–90% of cases [14]. Major clinical symptoms include chest pain, difficulty in breathing and coughing up rusty brown or blood-stained sputum or recurrent haemoptysis which mimics the pulmonary tuberculosis. Hence pulmonary paragonimiasis has to be differentiated from pulmonary tuberculosis.

Conclusion

Paragonimiasis has emerged as an important food-borne parasitic disease in India, mainly in the Northeastern States of India. In the last one year we have diagnosed five confirmed cases of paragonimiasis in paediatrics in Civil Hospital, Aizawl, Mizoram. Failure to recognize pulmonary paragonimiasis has resulted in over diagnosis of pulmonary tuberculosis and unwarranted antitubercular therapy, which will have a negative impact on the outcome of the Revised National Tuberculosis Control Programme, especially in the tuberculosis endemic areas. Mahajan emphasized the need to generate awareness among the clinicians and public regarding paragonimiasis and to consider this disease in the differential diagnosis of PTB in places where both co-exist[15].

To date, five Paragonimus species viz. P. heterotremus, P. skrjabini, P. hueitu'ngensis, P. miyazaki manipurinus n. sub spp and P. westermani have been reported to infect two fresh water crabs; Potamiscus manipurensis and Alcomon superciolosum, which serve as second intermediate hosts in Manipur.[6] Further research work is required to determine the morphological identification of the hosts (crabs, crayfish, snails) in the water resources of Mizoram.

General awareness programmes in people are required regarding their food habits and also among clinicians to avoid overdiagnosis of tuberculosis.

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Figures

Fig.1 Paragonimus egg, 40X

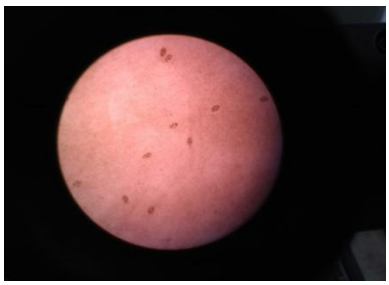

Fig.2 sputum wet mount smear showing paragonimus egg at 10X

Figures

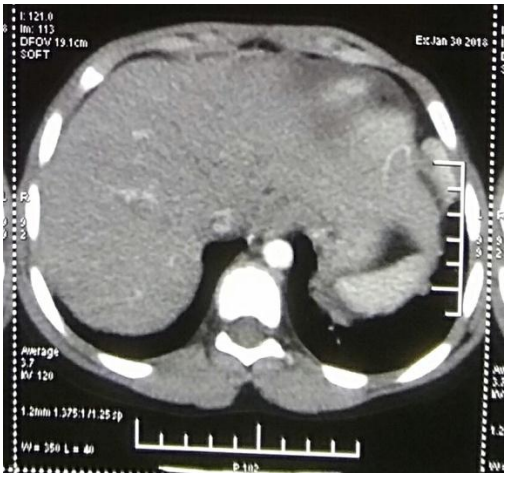

Fig 2. CT chest showing left lung abscess.

Table

Elisa Result
Tab.1 showing ELISA report of whole family
(Values above 0.0738 are considered positive)

Sample of	Sample name	O.D
	Negative control	0.063
	Positive control	0.352
Patient	MZ01	0.227
Father	MZ09	0.067
Mother	MZ10	0.069