

A Case of Paragonimiasis With Lung Lobectomy In Northern Côte d'Ivoire

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Abstract

Summary: An unusual case of paragonimiasis in Northern Côte d'Ivoire with pulmonary complications necessitating a lobectomy is described. This case highlights the impact of delays in diagnosing and treating paragonimiasis infections. As such, the case also illustrates the potential impact of misdiagnosis as tuberculosis. We discuss inherent challenges for the diagnosis of paragonimiasis in Côte d'Ivoire.

Keywords: paragonimiasis, pulmonary distomatosis, foodborne disease, zoonoses, Côte d'Ivoire

Introduction

Paragonimiasis, also known as pulmonary distomatosis or endemic hemoptysis, is a zoonotic lung disease caused by trematodes of the genus *Paragonimus*. It is classified by the World Health Organisation as one of the neglected tropical diseases (NTDs) within the category of foodborne trematodes together with clonorchiasis, opisthorchiasis, and fascioliasis [1]. Infection is acquired from consuming raw or undercooked freshwater crabs infected with *Paragonimus* metacercariae. Paragonimiasis is estimated to infect 23 million people worldwide [2,3,4], with potentially 292 million people at-risk [5]. While distribution is global, the disease is mainly found in the Americas, Africa, and Asia, particularly in tropical and subtropical regions, with the highest disease burden in Asia [6]. The disease affects a range of mammal hosts [4]. Although over 50 species have been found to infect vertebrates, only seven have been identified as disease-causing in humans, although additional species may occasionally infect humans [4].

Case Report

The patient, a 45-year-old female, originally from Bouna, in Northeast Côte d'Ivoire, presented in the first quarter of 2009 with a recurrent cough evolving for one year, unilateral right chest pain, three episodes of hemoptysis of low abundance and weight loss without fever. Several consultations were carried out at the Pneumo-Phthisiology department of the Centre Hospitalier Et Universitaire De Cocody (CHU de Cocody). Sputum and bronchial suction fluid

Paragonimiasis is particularly neglected in Africa where remarkably it remains the only human parasite where the life cycle is not fully characterized, with the first intermediate (snail) host unknown. Paragonimiasis has been recorded in 18 countries in Africa [7,8]. The majority of cases have been reported from four countries however, Nigeria, Cameroon, Liberia, and Côte d'Ivoire. While the central endemic regions are Southeast Nigeria and Southwest Cameroon, foci of infection are also evident in Côte d'Ivoire, particularly the South/Southwest [9]. The first case in Côte d'Ivoire was discovered in 1947 [10]. Following this case, several authors have reported many patients with paragonimiasis infections [11,12,13,14]. In the past two decades, most cases in Côte d'Ivoire (including those in mammals and intermediate crab hosts) have been reported in the South/Southwest by Aka et al. [15,16,17,18]. We report a case of paragonimiasis from Northeast Côte d'Ivoire, the first reported from the region.

samples were tested for acid-alcohol-resistant bacillus (BAAR) to diagnose tuberculosis infection. These were found to be negative and non-specific treatment of pulmonary tuberculosis was initiated (bronchiolitis and standard antibiotic treatment). A gradual onset of exertional dyspnoea led her to consult in August of the same year at the Abidjan Cardiology Institute, where a CT scan revealed minimal pleurisy on the right pleura and atelectasis of the right middle lobe.

Encountered by chance by our laboratory in September 2009, questioning revealed a rare consumption of unidentified freshwater crabs bought from a local market. The cough was still valid, so the patient provided stool and sputum samples over three days to allow parasitological examinations. Sputum samples were pre-processed with Ritchie's concentration technique, and all samples were directly examined by light microscopy.

Analyses revealed numerous eggs of *Paragonimus* sp., with an average size of 75 / 39µm, based on measurements made from 30 eggs. The patient was treated with Praziquantel (25 mg/kg/day) for

Discussion

This case reveals the challenges in diagnosis and early management paragonimiasis in Côte d'Ivoire. The patient underwent a long therapeutic route before her illness was identified. The fact that the health practitioners were unfamiliar with this condition led to delays in appropriate treatment, resulting in complications and a lengthy recovery period suffered by our patient. An earlier diagnosis could have avoided this. A recent study has found significant gaps in knowledge of paragonimiasis in healthcare practitioners in Côte d'Ivoire [19]. An additional challenge for diagnosis in northern Côte d'Ivoire is that paragonimiasis is less likely to be suspected, as freshwater crabs are rarely available and eaten in the region. The ecology of the region is also less suitable for transmission being drier and more Sahelian with less forest cover, and therefore less suitable for intermediate host freshwater crabs and reservoir mammalian hosts. This case is unusual also as the patient is Muslim, where crab consumption is rare as crabs are considered non-Halal. Indeed, this is the first record of paragonimiasis from Northeast Côte d'Ivoire.

The clinical picture presented by our patient is one of the complications of pulmonary distomatosis. From a therapeutic standpoint, the usual treatment is with Praziquantel at a dose of 25 mg/kg/day for three days. However, in our case, in addition to chemotherapy, a lobectomy was performed, given the extent of the damage caused to the lungs. Other types of complications have been reported in the literature, such as neurological complications, which may indicate cerebral localization [20,21,22]. Apart from the complications, the clinical presentation was typical for

Conclusions

Paragonimiasis, although endemic, is a little-known disease in Côte d'Ivoire, and raising awareness among healthcare practitioners is critical to ensuring timely diagnosis and treatment. Further, increased knowledge of safe-eating practices could reduce the likelihood of

three consecutive days, with additional treatment of five days, a week later, after a positive parasitological examination. This treatment appeared to clear the pulmonary focus. In addition, the patient underwent a lobectomy by right posterolateral thoracotomy one week after our discovery. The course of the condition was marked by regression of cough, chest pain, dyspnoea, and hemoptysis after three months. Functional respiratory re-education allowed recovery of respiratory function after two years. The patient was also provided with food-safety advice.

paragonimiasis. As presented by the patient, persistent cough, hemoptysis, and chest pain are all common symptoms of paragonimiasis infections in Africa (and elsewhere) [8]. While fever is a relatively common symptom, its absence is not unusual, except in cases of secondary infections [23].

Our case report illustrates a vital issue for this neglected disease: challenges in diagnosing paragonimiasis in Africa. Misdiagnosis as tuberculosis is possible, and paragonimiasis is likely underdiagnosed, particularly in Africa [8,24]. Indeed, paragonimiasis and tuberculosis have similar symptoms and clinical presentations.

Tuberculosis-screening centers have been utilized to detect paragonimiasis cases in Côte d'Ivoire and Benin [7].

Only four species have been reported in Africa, with two main species: *Paragonimus africanus* and *Paragonimus uterobilateralis*. Egg size morphology has been generally used to distinguish species in Africa, given the lack of other diagnostic methods available [25]. While the egg size measurements, in this case, were consistent with *P. uterobilateralis*, egg size is variable in African *Paragonimus* and in particular, an extensive range of egg sizes has been reported in Côte d'Ivoire [17]. Egg size, therefore, is not a robust method to distinguish species and molecular identification would be needed to confirm species. There needs to be more molecular data for African *Paragonimus* spp., with only three studies having published molecular findings [3,26,27]. Molecular studies on African species of *Paragonimus* are urgently needed [8].

transmission. The establishment of systematic screening for paragonimiasis in tuberculosis treatment centers and molecular studies investigating *Paragonimus* spp. will be crucial to tackling this neglected disease.

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