

Case Report

Multi-parasite infection in an immigrant from Ghana: potential for new epidemic foci

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Abstract

Introduction: Imported parasitosis, which do not require an invertebrate vector, are extremely dangerous and can lead to the occurrence of disease in currently parasite free areas. In the present study we report a case of multi-parasitic infection in a young immigrant from Ghana to Italy caused by filaria, *Schistosoma sp.* and *Strongyloides sp.*

Case presentation: A 27-year-old Ghanaian man attended the Hospital of Nuoro (Sardinia), Italy, at the end of August 2015, claiming pain to the kidney and hypertensive crisis; the patient presented with dyspnea and epistaxis, chronic itchy skin of the back, shoulders, arms and legs, anuria and high creatinine, metabolic acidosis and hypereosinophilic syndrome. Serological test for parasitic infections were done, and showed a marked positivity for filaria, *Schistosoma sp.* and *Strongyloides sp.* The patient started the treatment immediately with two doses per day of Bassado Antibiotic (tetracycline) for twenty days and then with a single dose of 3 mg of ivermectin that was repeated after 3 months.

Conclusions: Immigrant patients from endemic areas who show clinical signs, such as a general itching on the back, shoulders and arms and legs, should have a thorough history in order to make early diagnosis and prevent further complications. Therefore, general practitioners and doctors in Europe and in other parasitosis non-endemic countries, should consider to test for parasites in any immigrant from endemic countries to aid in establishing the final diagnosis and prevent further complications.

Key words: Helminthiasis; microfilariasis; Ghana; Italy; refugee camp.

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Introduction

Parasitic infections due to filaria, *Schistosoma sp.* and *Strongyloides sp.* are common diseases occurring, also simultaneously, in developing countries [1]. Helminths infection symptomatology can be absent or not specific, if untreated it may result in long-term adverse outcomes. The problem of these parasitic infections, usually latent in migrants, refugees and especially in children, has been reported recently [2,3]. Those observations raised the concerns about the health status of the immigrant populations and few screening protocols have been suggested in order to promptly establish the correct diagnosis and prevent further complications [4-6]. In the present manuscript, we are

reporting a case of multi-parasitic infection in a young immigrant from Ghana.

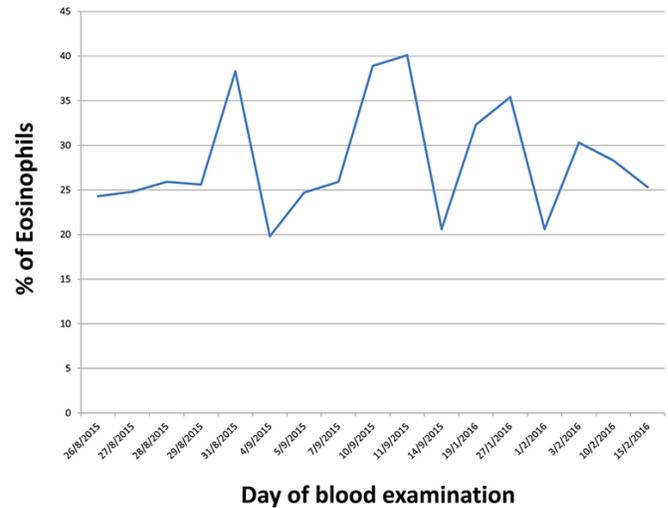
Case presentation

The reported patient was 27-year-old Ghanaian man attended the Hospital of Nuoro (Sardinia), Italy, at the end of August 2015, claiming pain to the kidney and hypertensive crisis. Before admission, he was treated by his general practitioner with anti-hypertensive drugs that temporarily reduced the high blood pressure and also corrected his electrolytes level. However, re-occurrence of the pain has motivated the patient to come to our hospital. Initial laboratory studies revealed malignant hypertension (PA 220/110 mmHg) and a

severe kidney failure (creatinine = 13.3 mg/dL) (CKD; Chronic Kidney disease), CKD-mineral and bone disorder (CKD-MBD) with renal osteodystrophy characterized by mineral, bone, hormonal and calcific cardiovascular abnormalities common in CKD. Moreover, the patient suffered of dyspnea and epistaxis, chronic itchy skin, anuria and high creatinine, metabolic acidosis, hypoalbuminemia, proteinuria, sideropenic anemia, hypereosinophilic syndrome and the blood test confirmed hepatitis B (HBV) infection, being positive to HbsAg and Hepatitis B – Deoxyribonucleic acid (HBV-DNA) (1590 UI/mL). A chronic renal failure could be early detected by direct measurement of the glomerular filtration rate (GFR); our patient had a very low GFR concentration and the renal treatment usually helps to control signs and symptoms, reduce complications and slow the progression of the disease. If the kidneys become severely damaged, it would be necessary to start the treatment for end-stage kidney disease such as the hemodialysis. The haemodialysis was performed using the PMMA (polymethylmetacrilate) membrane. At the time of admission at the Department of Nephrology, the ultrasound test showed small frameless parenchymal kidneys and very low GFR, thus a hemodialytic treatment through central venous catheterization of the internal jugular was started for the kidney failure. Two days after the beginning of hemodialysis, the patient became febrile, body temperature (39°C), and the performed blood-culture result positive for *Staphylococcus aureus*.

Since the hypereosinophilia was persistent (Figure 1), we performed an enzyme-linked immunosorbent assay (ELISA) test to determine the Antinuclear Antibody Profile (ANA), which excluded auto-immune disorders such as Lupus Erythematosus (SLE) or Primary Antiphospholipid Syndrome (APLS). The patient was also complaining a general itching on the back, shoulders and arms and legs, which were not responding to anti-histamines. Based on the patient’s symptoms and history during the last 2 years and the exclusion of other possible diseases, we suspected parasitic infection. When we looked for parasites in

Figure 1. Eosinophils count correlated to follow up blood samples from a patient with multiple parasitic infection.



urine and fecal samples, none was found. Then we collected blood samples from the patient, morning and night, for parasitological search and serodiagnosis analysis. Despite the negative parasitological results, the serological test, ran at the Department of Infectious - Tropical Diseases and Microbiology of the IRCCS Sacro Cuore Don Calabria Hospital in Negrar, Verona (Italy), showed marked positivity for filaria, *Schistosoma* sp. and *Strongyloides* sp. (Table 1). Indeed, we treated our patient firstly with two doses per day of Bassado Antibiotic (tetracycline) for twenty days, and then with a single dose of 3 mg of ivermectin that was repeated after 3 months. On 24th June 2016, when the patient came to the Hospital for a second cycle of ivermectin, he referred less itching and fatigability.

The follow-up visits documented a gradual resolution of symptoms, normal laboratory values, in particular the reduction of the eosinophil count.

Discussion

In the present manuscript, we are reporting a multi-parasitic infection in a young immigrant from Ghana. He came to the hospital in the first instance claiming pain to the kidney, after several tests, he was diagnosed with severe kidney failure and malignant hypertension.

Table 1. Titration of serological tests against antibodies of parasitic infection due by *Strongyloide* sp., *Schistosoma* sp. and microfilaria’s.

Test	Method	Serology titration	Reference value
Anti-Strongyloides	IFAT	320	< 20 negative ≥ 20 positive
Anti-Filaria	ELISA	3.62	< 1 negative >1 positive
Anti-Schistosoma	ELISA	1.72	< 0.9 negative > 1 positive 0.9 ≤ 1 doubt

The examination and the microscopical analysis did not evidence any parasitic infection. Despite of it, the patient history, and the clinical symptoms of clinical features let us a suspect of an acute parasitic infection, which was confirmed by serological tests. The results obtained by the serological tests confirmed the actual epidemiological state of Ghana [7, 8].

Intestinal parasitic infections are considered to be a major public health problem in developing countries. Soil-transmitted helminths and food-born parasites are usually associated with poverty and limited resources confirming that the access to water and sanitation is important to control and eliminate those diseases [7,9,10]. The endemicity, distribution and epidemiology of these diseases are determined by a complex dynamic of environmental and social factors. The changes in agricultural practices due to variation in temperature and rainfalls can affect the transmission of these diseases. A study that analyzed fresh vegetables from an open-aired market in the city of Accra, the capital of Ghana, revealed that 46% of vegetables presented larvae of *Strongyloides stercoralis* [11]. *S. stercoralis* larvae, once eliminated and released through the feces, became the infective filariform one, that infects people by penetrating the intact skin [12]. The real prevalence of Strongyloidiasis in the population of Ghana is still not fully known. In a cohort study of pregnant women from the middle-belt of Ghana it was reported that only about 1.9% [13] and it dropped to 0.3% in a cohort of school-children in the city of Accra [7]. Strongyloidiasis is in general asymptomatic or causes unspecific symptoms, indeed it should be taken into consideration during the general screening.

Schistosomiasis is transmitted by free-swimming larva, infected hosts release eggs into fresh water, through fecal material in case of *S. mansoni* or urine in case of *S. haematobium* [14]. After eggs hatch, a free-swimming ciliated larva (miracidium) infects an intermediate host, a snail where reach the matureness of free-swimming infected larva (cercariae) which infect the final host directly penetrating the skin [15]. In Ghana, *S. mansoni* and *S. haematobium* are endemic, respectively with a prevalence varying from 1.1% to 78.3% and from 3.3% to 19% [16,17] Those differences depend on the method used for the diagnosis and on the setting and cohort studies. Schistosomiasis, as well as Strongyloidiasis, can remain asymptomatic or produce unspecific symptoms that, if undiagnosed, can lead to very severe complications, even infertility and bladder cancer.

The Lymphatic filariasis can result in an altered lymphatic system and the abnormal swelling of the

limbs (lymphedema or elephantiasis for late stage) and/or genitalia (hydrocele) in men, causing pain, disability and social stigma [18]. Lymphatic microfilaria are transmitted by mosquito bites, indeed the absence of the vector, should ensure the no transition of the parasitosis [19]. Lymphatic microfilaria major vectors are the mosquito belonging to the *Culex pipiens* complex, which is also the most spreading worldwide, and is present in Sardinia, as well as in other Italian regions [20] as well as in all Europe [21]; nevertheless, the attention is focused on these insects as vector of viruses [22,23]. In all Europe, the lymphatic microfilaria infection due to *Oncocherca lupi*, a typical zoonosis with some anthroponotic aspect, have been reported in dogs and cat since 1967 from the Iberian Peninsula [24], Rumania [25]. In 2014 a first case of human lymphatic microfilaria infection has been reported in Germany [26], but the invertebrate vector has still not been identified.

The climate changes are remodeling the distribution of vectors and diseases, in fact all vector-born disease are extremely susceptibles [27]. These effects are already observable through the spread of different vectors in areas where it had never been reported before, such as the case of *Leishmania* sp. vector, a sand-fly mosquito, which has been found in Austria [28] a *Leishmania*-free country.

Indeed, the presence in Europe of the specific invertebrate vector of *Oncocherca* sp. may be an important point to take care for a spreadable infective disease such as human lymphatic microfilaria.

The clinical case here we are reporting want to point out two different problems from the same face of the medal.

The first is the need for proper screening of migrants in order to avoid the silent perseverance of infection that lead to disfiguring, painful and at the end untreatable diseases as already reported by Spertilli Raffaelli and co-workers [29]. On the other hand, we would like to point out that imported parasitosis, which do not require an invertebrate vectors or that present the compatible vector in the not endemic area, are extremely dangerous and can lead to instauration of the disease in to date free area.

Thus, the promptly detection of the parasitic infections in not endemic areas would avoid their propagation into the community and the dreadful consequence for the patient if not treated. Indeed, the professional from health system should be awareness and capacitated for this imported tropical diseases.

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Authors' contributions

MF, SSL, SA, VA, AN, BP, AS, AF, RI, and FL drafted the manuscript. MF, SA, VA, AN, BP, AS, AF, RI, and FL conducted the clinical examinations and Laboratory tests. MF, SSL, EES, SA, VA, AN, BP, AS, AF, RI, and FL reviewed the manuscript and participated in the layout and design of the report. All authors read and approved the final manuscript.

Ethics approval and consent to participate

The patient's informed consent was obtained for publication. This report was approved by the U.O.C. Laboratory Analysis Review Board.

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