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CASE PRESENTATION

Loeffler syndrome in a pediatric patient: regarding a case

Síndrome de Loeffler en paciente pediátrico: a propósito de un caso

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ABSTRACT

Introduction: Loeffler syndrome is characterized by acute and transient lung inflammation that occurs in response to the presence of soil-transmitted helminths in the lung tissues. In the Guantánamo province, it is considerably difficult to determine the real prevalence of intestinal parasitism in pediatric ages.

Objective: to describe the case of a pediatric patient with Loeffler syndrome.

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Case presentation: six-year-old male patient with black skin, rural origin, school, complete vaccination schedule and apparent health history. He came to our services accompanied by his mother because he had had respiratory symptoms approximately five days ago due to a wet cough accompanied by fever, with chest pain accompanied by difficulty breathing. For this reason, he was transferred to the PICU where he was diagnosed with total right-sided pneumonia. It is reported to be serious and the drainage of 540 ml of bloody blood content with abundant slough and with expulsion through the pleural tube of an adult worm (Ascaris lumbricoides) is confirmed by the Overholt system, which appears parasitism and is diagnosed with Loeffler syndrome.

Conclusions: the diagnosis of Loeffler syndrome is based on the characteristic respiratory symptoms, findings on chest x-rays and eosinophilia in peripheral blood, and also requires the exclusion of other types of eosinophilic lung disease. The patient's timely diagnosis allowed a completely satisfactory clinical improvement with positive results.

Keywords: *Ascaris lumbricoides*; Eosinophilia; Pulmonary Eosinophilia; Pediatrics

RESUMEN

Introducción: el síndrome de Loeffler se caracteriza por la inflamación pulmonar aguda y transitoria que ocurre como respuesta a la presencia de geohelmintos en los tejidos pulmonares. En la provincia Guantánamo se dificulta considerablemente determinar la prevalencia real de parasitismo intestinal en edades pediátricas.

Objetivo: describir el caso de un paciente pediátrico con síndrome de Loeffler.

Presentación del caso: paciente masculino de seis años de edad de piel negra, procedencia rural, escolar, esquema de vacunación completo y antecedentes de salud aparente. Acude a nuestros servicios acompañado de su madre por presentar hace aproximadamente cinco días manifestaciones respiratorias dadas por tos húmeda acompañada de fiebre, con dolor torácico acompañado de dificultad para respirar, por tal motivo es trasladado a la UCIP donde se le diagnostica neumonía total derecha. Es reportado de grave y se constata mediante el sistema de Overholt el drenaje de 540 ml de contenido piosanguinolento con abundantes esfacelos, y con expulsión por la sonda pleural de un verme adulto (*Ascaris lumbricoides*) que impresiona parasistismo, siendo diagnosticado con un síndrome de Loeffler.

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Conclusiones: el diagnóstico del síndrome de Loeffler se basa en los síntomas respiratorios característicos, los hallazgos en las radiografías de tórax y la eosinofilia en sangre periférica, requiere además de la exclusión de otros tipos de enfermedad pulmonar eosinófila. El diagnóstico oportuno del paciente permitió una mejoría clínica completamente satisfactoria con resultados positivos.

Palabras clave: *Ascaris lumbricoides*; Eosinofilia; Eosinofilia Pulmonar; Pediatría

INTRODUCTION

Intestinal parasitosis constitutes a major public health problem in the world. The World Health Organization estimates that soil-transmitted helminth infection affects approximately 1,5 billion people, especially in tropical and subtropical areas, such as sub-Saharan Africa, America, China and East Asia. (1)

It is known that Ascaris lumbricoides infection is the most frequent and cosmopolitan soil-transmitted helminth infection of all human helminth infections. It is fundamentally associated with Loeffler syndrome, being responsible for 49,9 million loss of disability-adjusted life years. (2)

Loeffler syndrome, also known as larval migration syndrome, was discovered in 1934. It is a lung disease caused by the migration of parasite larvae in the human body. It is characterized by acute and transient lung inflammation that occurs in response to the presence of soil-transmitted helminths in the lung tissues. (1,2)

It infects about 25 % of the world's population. In 2016, it was estimated that more than 1 billion people were infected, causing 20 000 deaths annually. The prevalence is highest in children aged 2 to 10 years. (3)

It has a very low incidence globally, due to its underdiagnosis. In Cuba, it constitutes an exotic cause of obstructive jaundice with few cases reported. (4)

In the Guantánamo province, it is considerably difficult to determine the real prevalence of intestinal parasitism in pediatric ages. For these reasons, the I National Survey of Intestinal Parasitism in Pediatric Age was developed in 2023, with the objective of identifying the main microorganisms and the

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development of antimicrobial resistance, to modify the treatment schemes in antiparasitic therapy. (5)

Multifactorial analyzes were generated related to hygienic habits and the actions of entities such as Communal, Aqueduct and Education which, by acting synergistically, avoid complications for these entities. Ascariasis was among the main diseases to be investigated. (5)

Taking into consideration the above and assessing the infrequent number of pediatric patients with said pathology, the following case report was prepared, in which the combination of laboratory, microbiological and imaging diagnostic criteria will be revealed. The objective of this presentation is to describe the case of a pediatric patient with Loeffler syndrome.

CASE PRESENTATION

Six-year-old male patient with black skin, rural origin, school, complete vaccination schedule and apparent health history. He goes to the pediatric emergency department at the Pedro Agustín Pérez Pediatric Hospital in the Guantánamo municipality, Guantánamo province, Cuba, accompanied by his mother. It states that approximately five days ago he began to have respiratory manifestations due to a wet cough accompanied by fever, not confirmed thermometrically; he was medicated with dipyrone, a 300 mg tablet orally on one occasion. In addition, on the day he presented chest pain on the side with difficulty breathing of light to moderate intensity, which is why it was decided to admit him for study and treatment.

Physical exam

Skin and mucous membranes: normal colored and moist.

Respiratory system: subcostal and intercostal indrawing, no cyanosis, no respiratory moan, no nasal flaring, decreased vesicular murmur in the right lung field, increased vocal vibrations, presence of crackles in both lung bases. Respiratory rate: 40 breaths/min.

Cardiovascular system: audible, rhythmic heart sounds of good tone and intensity, no murmurs, capillary refill approximately three seconds, warm distal temperature, pedal pulses present and synchronous. Heart rate: 90 beats/min.

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Abdomen: flat, soft, depressible that follows respiratory movements and coughing, fluid sounds present and normal, not painful on superficial or deep palpation, no palpable tumor, no visceromegaly.

Subcutaneous cellular tissue: not infiltrated.

Central nervous system: conscious, oriented, no meningeal signs, no signs of neurological focus. Glasgow: 15/15 points.

It is diagnosed by clinical and complementary imaging, total right pneumonia, for which antimicrobial treatment with ceftriaxone (1g-10 ml) 13 ml plus 30 ml of saline solution with an isotonic concentration of sodium chloride (NaCl) at 0,9 % intravenously every twelve hours, to be administered in thirty minutes and vancomycin (500 mg-10 ml) 8 ml plus 100 ml of saline with an isotonic concentration of 0,9 % NaCl intravenously every six hours, to pass in three hours.

Subsequently, due to the clinical presentation and the ultrasound results of lung bases that revealed a small amount of pleural effusion, it was decided to place a medium minimum pleurostomy tube connected to an Overholta system 10 cm of water. After the installation of the probe, serohematic fluid with abundant slough is observed. On the fourth day of his hospitalization, he was reported to be in serious condition and, using the Overholt system, the drainage of 540 ml of bloody content with abundant slough was confirmed and an adult worm (Ascaris lumbricoides) was also expelled through the pleural tube, which showed parasitism at that level being diagnosed with Loeffler syndrome.

Complementary exams

Laboratory studies:

Blood count, Complete blood count: Hematocrit (Hct) 0,28 L/L, Hemoglobin (Hb) 9,24 g/L, Eosinophils 4 %, Erythrocyte sedimentation rate (ESR): 130mm/h, Leukocytes: 13,5 X 109/L, Hemochemistry, Blood glucose 3,9 µmol/L, Creatinine 59,6 µmol/L.

Laboratory tests indicated an eosinophilia of 4 %, a slight decrease in hemoglobin (9,24 g/L) and hematocrit (0,28 L/L) values, as well as accelerated erythrocyte sedimentation rate in relation to the parasitic process lung level. While glycemia, creatinine and leukocytes were within normal reference values.

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Microbiological studies:

Cytochemical examination of pleural fluid: yellow appearance.

Rivalta: negative.

Cell: 873 X 10^{-6}

Imaging tests:

Thoracic ultrasound: Mucoid thickening of the pleura associated with a small, unclear pleural effusion, not a septum, associated with inflammatory lesions. Left lamellar pleural effusion (figure 1).

Fig. 1. Chest ultrasound

Chest X-ray PA view: Homogeneous radiopacity involving the entire right hemithorax, without air bronchogram, in relation to large pleural effusion without ruling out an inflammatory process (figure 2).

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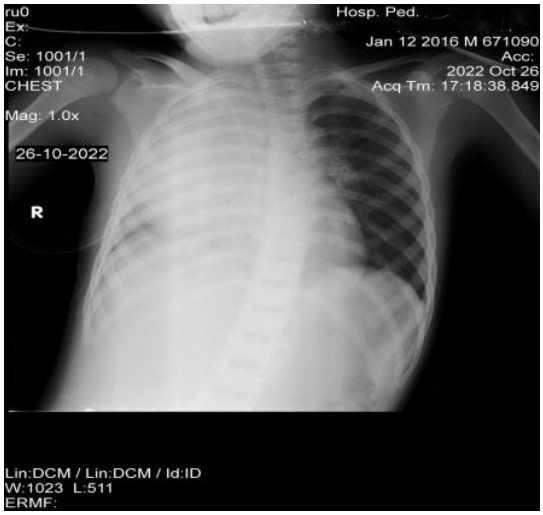

Fig. 2. Chest X-ray PA view

Radiological improvement with a decrease in radiopacity, of interest to the midfield and base. Radiolucency in the right parahilar region that is related to pneumatocele (figure 3).

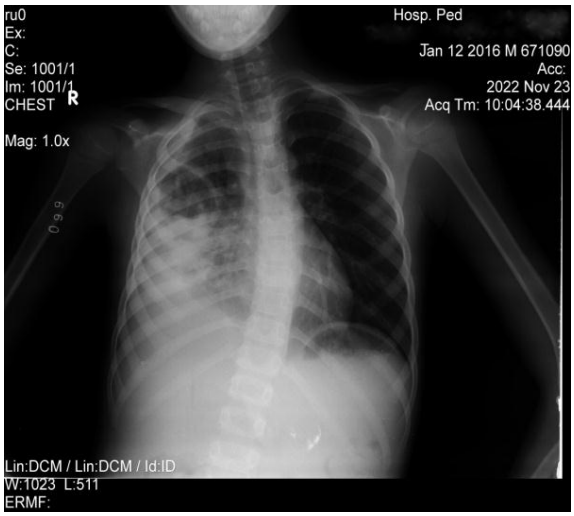

Fig. 3. Chest X-ray PA view

As therapeutic conduct, it is decided by the Pediatric Intensive Care Unit (PICU) group to begin the antiparasitic therapeutic regimen (anthelminths), with albendazole 400 mg single dose orally.

Twelve days after admission, he drained 45 ml of serohematic content with no evidence of the presence of Ascaris lumbricoides. Then, due to clinical improvement, it was decided to transfer him to the Pediatric Intermediate

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Care Unit (PICU) and he continued with antimicrobial treatment: ceftriaxone (1 g-10 ml) 13 ml plus 30 ml of saline solution with an isotonic concentration of NaCl at 0,9 % intravenously every twelve hours, to be administered in thirty minutes and vancomycin (500 mg-10 ml) 8 ml plus 100 ml of saline with an isotonic concentration of 0,9 % NaCl intravenously every six hours, to pass in three hours; until his transfer to the respiratory room where, due to the favorable evolution he presented, he was discharged after forty-two days, concluding all the pharmacological treatment and with follow-up by his health area.

DISCUSSION

Ascaris lumbricoides is the largest parasitic intestinal nematode of the human species. Widely distributed in dry regions with short periods of rain. Transmission is fecal-oral. The adult worms live in the lumen of the small intestine and the females expel the eggs in the feces. [6]

According to the criteria of Guerra Macías et al., [7] it is an enteroparasitosis that does not respect age, but its prevalence is higher in the pediatric population where it causes nutritional deficit, iron deficiency anemia, poor intestinal absorption, growth and cognitive alterations irreversible, as well as pulmonary and digestive complications, which corresponds to the present investigation.

Respiratory symptoms, often transient, findings on chest x-rays and eosinophilia in peripheral blood constitute common elements found in the scientific literature compared to other case reports; which require the exclusion of other types of eosinophilic lung disease. For example, acute eosinophilic pneumonia, a specific entity with acute onset. [8]

According to González Napoli et al., [9] the chest x-ray shows transient and intermittent alveolar infiltrates of a few millimeters to several centimeters in diameter, findings that are related to those found in the complementary imaging examinations of the pediatric patient, as well as invasive procedures, which are performed in the context of complications, such as pleural effusions.

According to the criteria of Hernanz Lobo et al., [10] the diagnosis is made by microscopic visualization of parasite eggs in fecal matter or macroscopic visualization of the adult parasite as it passes through the rectum, through the nasal passages or the mouth (generally in vomit), or from the larvae in sputum or gastric material, if it coincides with the pulmonary phase.

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In this case, the application of these procedures was not necessary, since the complementary studies for the analysis of the pleural fluid confirmed the diagnosis of Ascaris lumbricoides, for this reason it showed a different behavior from the cases described in the literature worldwide.

CONCLUSIONS

The diagnosis of Loeffler syndrome is based on characteristic respiratory symptoms, findings on chest x-rays and eosinophilia in peripheral blood, and also requires the exclusion of other types of eosinophilic lung disease. The most important thing for the successful treatment of this pathology is the use of imaging, laboratory and microbiological studies for its diagnosis, as well as the use of antiparasitics in its pharmacological therapy. The patient's timely diagnosis allowed a completely satisfactory clinical improvement, with positive results.

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STATEMENT OF AUTHORSHIP

AGPD: conceptualization, data curation, research, methodology, supervision, validation, writing-review and editing.

LMEC: conceptualization, formal analysis, research, project administration, resources, validation, writing the original draft.

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YEG: data curation, formal analysis, methodology, resources, validation, visualization.

CONFLICT OF INTERESTS

The author declares that there are no conflicts of interest.

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