

Intestinal Obstruction by *Ascaris lumbricoides* in a 12-year-Old Boy: A Case Report in Pakistan

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Abstract

Background: Ascariasis is a severe parasitic disease widely prevalent in remote parts of Pakistan due to poor sanitation, and improper water supply system.

Objective: The aim of this study is to describe an unusual clinical course of severe intestinal ascariasis in a boy of 12 years old in Khyber Pakhtunkhwa, Pakistan.

Methods: Multi-disciplinary clinical and laboratory examinations, including physiological and immunodiagnostic techniques, socioeconomic status and imaging, have been performed during hospitalization.

Results: A case of severe intestinal ascariasis was diagnosed at an age of 12 years old. The patient felt headache, abdominal pain and vomiting. Pre operation diagnosis was included: erythrocytes below and leucocytes were above the normal range. Blood, pressure, temperature and serum amylase were normal. Three days after his admission to the hospital, 03 kilograms roundworms were evidenced from the small intestine in a surgical trauma of the patient. Based on their morphological characterization the parasites were identified as *Ascaris lumbricoides*.

Conclusions: Ascariasis should always be taken into consideration in a differential diagnosis of irregular space-occupying lesions located in the intestine, especially in patients who live in endemic areas and their epidemiological history indicates potential risk factors for the infection. In children appendicitis is more frequently recognized than in old age, and a clinical prognosis can be no less severe than in young patients. Early diagnosis of *A. lumbricoides* infection in humans provides the choice of proper and optimal treatment for saving or significantly extending a patient's life.

Keywords: *Ascaris lumbricoides*; Intestinal abstraction; Intestinal parasitosis; Soil transmitted helminthiasis; Un-hygienic; Waterborne infection

Introduction

Ascariasis is a chronic and potentially fatal parasitic disease caused by a nematode infection of *A. lumbricoides*. This parasite has a wide range of geographic distribution, infects 0.8 to 1.2 billion people worldwide and is a major cause of disease burden, especially in developing countries, with an estimated loss of 1.2 to 10.5 disability life years [1]. The infection is caused by the accidental ingestion of embryonated eggs, which are shed with faeces of definitive hosts and widely spread in the natural environment. The main risk factors for this parasitic infection in humans are the consumption of raw vegetables and fruits and an occupational or recreational exposure to contaminated soil. Professions related to agriculture have been documented to be potential risk factors for this severe anthroponosis [2]. The worm number is directly related to morbidity, intensity of infection is an important indicator of *Ascaris* disease burden [3]. Ascariasis is an important soil-transmitted disease with enormous health and social implications for school aged children

in impoverished and endemic communities of tropical Africa, Asia and South America [4-6].

Control strategies of targeted chemotherapy have achieved significant reduction in morbidity, they have failed to significantly break transmission in areas where socio environmental risk factors have continued to play vital roles in the daily life adequate facilities for water supply and sanitation, ignorance and poverty. According to a report, [7] there is a direct relationship between these risk factors and patterns of ascariasis transmission in most endemic communities while [6], stated the importance of an integrated approach to control as these factors act in concert, they showed that improved water supply and sanitation without a corresponding increase in awareness of living standard does not always lead to a reduction in transmission level. Hand washing with soap has been shown to be an effective preventive measure [8,9].

The locality is mapped on northern parts of Upper Dir district. The socioeconomic status of the residents are low, unhygienic and non-satisfactory. This is the least scientifically explored part of Pakistan, bounding with Afghanistan in its West, in South it is linked with lower Dir district, to East it has boundaries with Swat, district and on the North, Northern areas of Pakistan. No proper medication and health facilities are available. Residents depend on rain storing drinking

water, and raw vegetables. It is reasonable to suggest the promotion of hand washing with soap and boil the water for drinking may reduce both prevalence and intensity of *Ascaris* infection. This study describes the uncommon case of *A. lumbricoides* recently hospitalized in the City hospital Timergara, Dir, KPK, Pakistan, who was treated in advance for *A. lumbricoides* infection.

Case Report

In November 2015, a 12 year old boy who used to live in a livestock-raising area in the North of upper Dir district of Pakistan admitted in a city hospital with an asymptomatic abdominal pain, headache and vomiting. No other symptoms were evident.

On physical examination, there was a spoliative action in the upper alimentary tract. On the laboratory analysis, hemoglobin level was 10.8 g/dl and leucocytes count was 15600/mm³, the liver function tests were within normal values. History of the patient alimentary habits revealed that he used to eat raw vegetables and drinking water from pipe or in other hand open natural pond on routine basis. The patient denied having consumed improperly cooked foods, such as beef etc. Headache and vomiting recurred on the 2nd day of admission in the hospital. After that the patient gave written informed consent, a surgical trauma was done. A surgical operation of the small intestine showed the evidence of *Ascaris lumbricoides*. The removed worms were 03 kilograms in weight, weighted with a standing scale. Socioeconomic profile of the patient revealed: labor in occupation, use pipe water or for some time upstream water for drinking purposes, household number were above 10 individuals. Anthropometry was showed 57" height, 25" abdominal circumference, and 31 kg in weight. The patient was treated with fraziquantel 300 mg, three times a day for 5 days and was followed up for variable intervals without any further sign and symptoms (Figure 1).

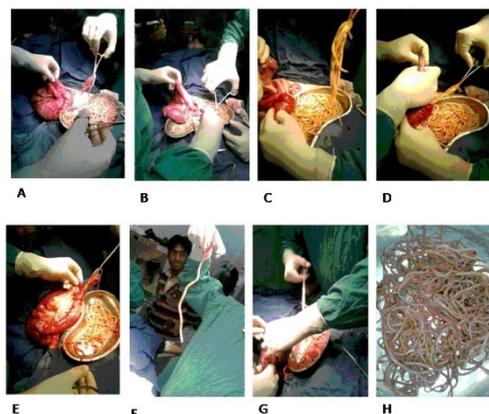


Figure 1: 03 kilograms *Ascaris lumbricoides* (roundworms) recovered during a surgical operation. A-B: Portion of small intestine and roundworms C-D: Roundworms were kept in the surgical tray, E: A portion of small intestine filled with worms F: Roundworms with a considerable size. G: Removal of the parasites from intestine, H: Stock of parasites after completion the surgical trauma.

The parasite was identified by macroscopic and microscopic morphological criteria as *Ascaris lumbricoides* by having the tail end of the male is curved ventrally in the form of a hook having a conical tip,

the genital pore open into the cloaca from which two curved copulatory spicules protrude. The anus opens with the ejaculatory duct in the cloaca. Female worms were larger and stouter than males. The posterior extremity of the female was neither curved nor pointed but conical and straight. The anus was sub terminal and opens directly on the ventral surface in the form of a transverse slit. The vulva opens at the junction of the anterior and the middle thirds on the mid ventral of the body. This is the narrower part and is called as the vulvar waist.

Outcome

The patient responded well to the treatment and a repeat stool sample was taken on 3rd day of surgery in which there was no evidence of active parasitic infection. The general condition of the patient was improved and he was finally discharged after 3 days of hospitalization.

Discussion

Ascaris lumbricoides is the most common pathogenic roundworms, infecting over 1/5 of the world population. The adult worms are usually 200-300 mm in length and both male and female worms live in the small intestine of definitive host. Each female releases about 20,000 eggs daily. These eggs are passed out in the faces and dispersed in the environment, which later found in soil, water, unclean fruit and vegetables and on banknotes. Under favorable conditions these eggs develop and emerge larvae. The infective embryonated eggs when swallowed, leave the shell and pass through the liver to the blood stream and lungs, finally travel back to the small intestine leaving the respiratory tract and then swallowed [1].

Human infection with *A. lumbricoides* is usually acquired by ingestion of embryonated eggs with raw vegetables cultivated on a soil contaminated by infected human excreta. Water supplies may be contaminated and infection may occur by drinking such water. Wherever the soil pollution is common, the eggs may directly be conveyed to the mouth by fingers. Infection may also occur by inhalation of desiccated eggs in the dust reaching the pharynx and swallowed. The eggs, instead of being swallowed may hatch on moist mucous surface of the upper air passage and the larvae may directly penetrate in to the blood stream. In present case, the patient used raw vegetables and drinking unboiled water from the local streams or otherwise pipe. The upstream area is agriculturally important. During cultivation and rainy seasons the surface runoff and waste water from the agriculture fields ingress into channels which are the major traditional source of drinking water. Therefore, it is reasonable to speculate that the patient was infected by eating the raw vegetables and drinking the unboiled stream water, which was contaminated with the embryonated *Ascaris* eggs. The poor sanitation practices i.e., use of traditional latrines, open field defecation, lack of health care and health education and use of fecal contaminated water are the main source of intestinal parasitic infections in the people of such a remote area of Pakistan.

In Pakistan *Ascaris lumbricoides* infection is widely prevalent, with variable distribution in different parts of the country. In various surveys the prevalence has been reported as: Gilgit-Biltistan 22.8% [10], Rural Peshawar 45.5% [11], Peshawar 38.8% [12], Swat district 39.8% [13], Karachi 11.9% [14], Peshawar 4.21% [15], Hazara Division 7.3% [16], Dir district N.W.F.P 14.9% [17], Quetta, city 1.8% [18], Chitral 68.7% [19], Larkana-Sindh 15.0% [20], Muzaffarabad-Azad Kashmir 3.8% [21], Swat district 39.8% [22] and other parts of the

country. Keeping in view that present study is a case report regarding 03 kilograms of *A. lumbricoides* from a school boy of 12 years in age. This is the first case report in its kind in Pakistan. *A. lumbricoides* could be the major parasites underlying ascariasis in the study area. Adequate prophylactic plans should be administered in the study area.

It was concluded that Ascariasis is becoming a major global health challenge due to its wide geographic range. It is also essential to implement prevention efforts in endemic countries such as health education campaigns on the disease, proper sanitation through appropriate disposal of faecal material, regular de-worming and the use of protective footwear. Intestinal abstractions of ascariasis are rare, but probably underestimated, and may lead to death or irreversible complications. Therefore, a diagnosis of ascariasis must be sought as soon as possible when faced with intestinal trauma and appendicitis. Also habits like eating soil or pica should be discouraged. Periodic deworming of mentally retarded individuals should be done so as to avoid further complications.

Authors Contributions

WK identified the parasite, drafted the manuscript and revised; Imran collected the research data and WA was the physician responsible for managing and treating the patient. All authors read and approved the final manuscript.

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