

Abdominal complications of ascaris lumbricoides in adults: A prospective hospital based 8 year experience from an endemic area of north India.Khurshid Ahmad Ganaie¹, Suraya Kounser², Shabir Hasan Rawa³¹MBBS,MS. Consultant Postgraduate Department of General Surgery, Government Medical College Srinagar.²MBBS,MS. Senior resident, Postgraduate department of Ophthalmology, SKIMS Medical College and Hospital Bemina Srinagar.³MBBS MS. Consultant Orthopaedics Health Services Kashmir**Correspondence Author:** Dr khurshid Ahmad Ganaie, Sholipora budgam, J&K, India**Type of Publication:** Original Research Paper**Conflicts of Interest:** Nil**Abstract**

Objective. The ascariasis is one of the most cosmopolitan intestinal parasite infections, and its biggest prevalence is observed in the tropical and subtropical areas. We are presenting a study emphasizing on ascariasis complications especially in adult patients, which has not been conducted so far in detail in the past.

Methods. A total of 198 patients of roundworm infestation were included in this study from 2008-2016. All these patients were more than 18 years of age and presented with some form of abdominal complication due to ascariasis. After proper diagnosis, treatment was initiated subsequently depending upon the condition of the patient. Majority of the patients were managed conservatively. Rest of the cases were managed by surgical or endoscopic intervention.

Results. Out of 198 patients, 130 patients (66%) presented with hepato-biliary disease. Of these 130 cases, 100 patients (77%) had biliary colic, 21 patients (16%) had cholangitis, 7 (5.5%) patients had acalculary cholecystitis, and 2 (1.5%) patients presented with liver abscess. 36 (18%) patients out of 198 patients presented with pancreatic disease, and 20 (10%) patients presented to us with intestinal obstruction-14 had sub-acute

intestinal obstruction and 6 patients presented with acute obstruction. Out of total 198 patients, 6 (3%) patients presented with peritonitis (perforation), 4 (2%) patients presented with acute appendicitis and 2 (1%) patients had meckle's diverticulitis.

Conclusion. Ascaris lumbricoides can present as acute abdomen in adult patients. Thus a clinician in emergency department should consider ascariasis as one of the differential diagnosis in case of acute abdomen in adults in an endemic area, which otherwise he is likely to miss in the first contact.

Keywords : Ascaris lumbricoides, Hepato-biliary disease, Intestinal obstruction, Peritonitis.

Introduction

Ascaris lumbricoides (AL) is the most common helminth affecting humans and causing important medical and social problems especially in the under-developing countries¹⁻². AL infestation occurs in all age groups but more common in children of preschool age³.

Ascaris lumbricoides infections have been reported in more than 150 countries across the globe, particularly in tropic, subtropic and temperate regions. Approximately 1.4 billion people worldwide are infected, 4 million of whom live in the United States. As an obligate internal

parasite of humans, *Ascaris lumbricoides* can theoretically be found wherever humans are present⁴. When environment becomes intolerable for their living, they migrate to more appropriate areas of intestinal tract. AL may cause serious problems at this migration including pancreatitis, cholecystitis, liver abscess, intestinal obstruction and even perforation⁵⁻⁶. Diagnosis with clinical symptoms and hematological investigation frequently is not possible. X-ray may show air fluid levels. USG may show two pairs of echogenic tubular structures (railway track) longitudinally and bull's eye horizontally^{1,7}. Tubular structures may have active movements that could make diagnosis easily. USG is a simple and reliable method for diagnosis of AL obstruction^{5,8}.

Among the intestinal parasitism, the ascaris lumbricoides is a nematode which is one of the parasitosis of wide diffusion in the world: the ascariasis. *Ascaris lumbricoides* is the most prevalent and the largest of the intestinal nematodes that infect humans. This illness is characterized by variable symptomatology; it is generally asymptomatic in the adult, and it is in children where we see the most florid clinical presentation and the complications of this illness. As most of the intestinal parasite infections, the ascariasis prevails and is endemic in areas lacking of sanitary infrastructure, with precarious housings, poverty and ignorance⁹.

The most common acute complication of AL is intestinal obstruction in younger age group. The rate of mortality from intestinal obstruction is 5.7% below the age of 10 years¹⁰. In adults the most common complication is hepato-biliary and pancreatic disease. Symptoms related to the migration of adult worms into the biliary tree can cause abdominal pain, biliary colic, acalculous cholecystitis, ascending cholangitis, obstructive jaundice, or bile duct perforation with peritonitis. Strictures of the

biliary tree may occur¹¹. Hepatic abscesses can also result¹². Retained worm fragments can serve as a nidus for recurrent pyogenic cholangitis. The pancreatic duct may also be obstructed, leading to pancreatitis, and the appendix resulting in appendicitis. Occasionally, migrating adult worms emerge from the mouth, nose, lacrimal ducts, umbilicus or inguinal canal. High fever, diarrhea, spicy foods, anesthesia and other stresses have all been associated with an increased likelihood of worm migration¹³.

Partial intestinal obstruction from AL may resolve spontaneously with the conservative treatment including bowel rest, intravenous fluids, and nasogastric decompressing¹⁴. When mechanical obstruction persists, bolus of worm acts a fixed point, and leads to intussusception or volvulus. *Ascaris* may also excrete neurotoxins and anaphylatoxins leading to small bowel spasticity and inflammation. These toxins may induce the mechanical obstruction as well¹⁵⁻¹⁶. Volvulus, intussusception or increasing pressure to the intestinal wall causes necrosis¹⁷. In case of necrosis, resection and primary anastomosis are necessary. Clinical disease is largely restricted to individuals with a high worm load¹⁸. When symptoms do occur, they relate either to the larval migration stage or to the adult worm intestinal stage. Pathophysiologic mechanisms include

- Direct tissue damage
- The immunologic response of the host to infection with larvae, eggs or adult worms¹⁹
- Obstruction of an orifice or the lumen of the gastrointestinal tract by an aggregation of worms
- Nutritional sequelae of infection¹³

A mass of worms can obstruct the bowel lumen in heavy *Ascaris* infection, leading to acute intestinal obstruction. The obstruction occurs most commonly at the ileocecal valve. Symptoms include colicky abdominal pain,

vomiting and constipation. Vomitus may contain worms. Approximately 85 percent of obstructions occur in children between the ages of one and five years. Sometimes an abdominal mass that changes in size and location on serial examinations may be appreciated¹³. Complications including volvulus, ileocecal intussusception, gangrene, and intestinal perforation occasionally result.

Material and methods

The study was conducted prospectively in the department of general surgery SMHS hospital of Govt. Medical College Srinagar Kashmir (India) from 2008 to 2016. Study was conducted on 198 adult patients irrespective of gender having abdominal complication due to ascaris lumbricoides infestation. The study was approved by ethical committee of our institution. Only those patients were included in the study whose age was more than 18 years. All these patients presented to our emergency department with abdominal complaints due to complication as a result of ascaris infestation. The diagnosis was made by USG (ultrasonography) in majority of cases. Other diagnostic modality used was stool examination for ascaris ova, X-Ray abdomen, ERCP. Some cases were diagnosed intra-operatively (peritonitis cases). All patients of suspected intestinal obstruction were initially subjected to conservative treatment (nil by mouth, intravenous fluid, nasogastric tube aspiration, rectal enemas (glycerine + liquid paraffin enema) and antihelminthic through nasogastric tube) depending upon the clinical condition and severity of obstruction. They were closely monitored with assessment of vital parameters, abdominal girth measurement and serial abdominal X –ray. Clinical improvement was defined as a decrease in abdominal pain and distension, decrease in abdominal girth and associated passage of flatus or stool with or without expulsion of worms. The

Radiological improvement was defined as a decrease in number of dilated bowel loops or decrease in the diameter of dilated small bowel. Patients were considered for surgical intervention if- there was any deterioration on clinical parameters. Similarly patients with hepato-biliary-pancreatic disease were treated initially with conservative method. Endoscopic examinations were done by side-viewing flexible duodenoscope. Those patients with USG (ultrasonography) documentation of ascaris were given antihelminthic prior to endoscopic procedure. The indications for ERCP were- a) failure to eradicate the extra-hepatic biliary system of worms after 4 weeks of conservative treatment. b) persistence of jaundice or deteriorating symptoms in presence of biliary ascaris. Dormia basket was used to retrieve the worms. Surgical exploration were reserved in those cases only were ERCP failed to remove the worms and having complications like deteriorating cholangitis, liver abscess formation etc. In patients with peritonitis (perforation peritonitis) as a result of ascaris complication, surgical exploration was done on emergency basis depending upon the clinical status of the patient. Patients having worms in gall bladder were operated on elective basis (cholecystectomy-preferably laproscopic cholecystectomy was done). Antihelminthic therapy was given to all patients in follow up period and were advised to take it at regular basis afterwards at home.

Results

The mean age of patients in our study was 29.6 (range 18-67 years) with S.D of 9 years. Out of 198 patients 131 (66%) were females and 67 (34%) patients were males (male : female ratio 1 : 2).

In our study we found 130 patients (66%), who presented with hepato-biliary disease. Out of these 130 patients, 100 patients (77%) had biliary colic, 21 patients (16%) had cholangitis, 7 (5.5%) patients had acalculous cholecystitis,

and 2 (1.5%) patients presented with liver abscess. Out of 198 patients 36 (18%) patients presented with pancreatic disease. 35 (97%) of these patients had acute pancreatitis and 1 (3%) patient had pseudocyst of pancreas. 20 (10%) patients out of 198 patients presented to us with intestinal obstruction, out of these 20 patients 14 (70%) had sub-acute intestinal obstruction and 6 (30%) patients presented with acute obstruction (4 patients had bolus obstruction and 2 patients had bowel gangrene at presentation). In our study out of total 198 patients, 6 (3%) patients presented with peritonitis, 4 (2%) patients presented with acute appendicitis and 2 (1%) patients had meckles diverticulitis (**table-1**).

Table – 1 :- Abdominal complications of ascariasis in adults.

Clinical presentation	No. of patients (%)
Hepato-biliary disease	130/198 (66%)
Biliary colic	100/130 (77%)
Cholangitis	21/130 (16%)
Acalcular cholecystitis	7/130 (5.5%)
Liver abscess	2/130 (1.5%)
Pancreatic disease	36/198 (18%)
Acute pancreatitis	35/36 (97%)
Psuedocyst pancrease	1/36 (3%)
Intestinal obstruction	20/198 (10%)
Sub-acute obstruction	14/20 (70%)
Acute obstruction	6/20 (30%)
Bolus obstruction	4/20 (20%)
Bowel gangrene	2/20 (10%)
Peritonitis	6/198 (3%)

Appendicitis	4/198 (2%)
Meckles diverticulitis	2/198 (1%)

121 (61%) patients out of 198 patients were managed conservatively (>90% of these patients were having hepato-biliary and pancreatic disease). In 34 (17%) patients we needed ERCP (diagnostic as well as thearupatic). Surgical intervention was required in 43 (22%) patients (**table-2**).

Table – 2 :- Indications for surgery

Clinical diagnosis	No. of patients
Hepato-biliary-pancreatic disease	25/198
CBD exploration for failed ERCP or persistant cholangitis	16
Gall bladder worms	7
Liver abcess	1
Pseudocyst pancrease	1
Intestinal obstruction (acute)	6/198
Peritonitis	6/198
Appendicitis	4/198
Meckles diverticulitis	2/198

Out of these 43 patients, laproscopic procedure was done in 26 patients (14 CBD explorations,7 cholecystectomies,

4 appendectomies and 1 cystogastrostomy), and other 17 patients under-went exploratory laprotomies (6 peritonitis, 6 acute intestinal obstruction patients, 2 CBD explorations (lap converted to open), 2 meckles diverticulitis and 1 liver abscess). 2 patients died in our study (one patient with pyogenic cholangitis and one with peritonitis).

Discussion

This study was conducted prospectively in the department of general surgery SMHS hospital of Govt. Medical College Srinagar Kashmir (India) from 2008 to 2016. *Ascaris lumbricoides* is a specific human helminth and lives in symbiosis with one-fifth of mankind²⁰. It is a manifestation of low socio-economic status and poor sanitary hygiene²¹.

The mean age of patients in our study was 29.6 (range 18-67 years) with S.D of 9 years. Out of 198 patients 131 (66%) were females and 67 (34%) patients were males (male : female ratio 1 : 2). Bhansali and Sethna²² in their study observed that, majority of cases being in the 3rd and 4th decade of life. Our study observed the similar results. Various surgical complications have been ascribed to roundworm infestation. Louw²³, in a review, found intestinal obstruction, biliary tract diseases, pancreatic diseases, peritonitis and appendicitis due to roundworms. Mishra PK et al.²⁴ and Wani I et al.²⁵ in their respective studies also found the similar abdominal complications and even the involvement of meckles diverticulum. In the present study we observed the same set of abdominal complications.

In this study we found 130 patients (66% of 198 patients) who presented with hepato-biliary disease. Out of these 130 patients, 100 patients (77%) had biliary colic, 21 patients (16%) had cholangitis, 7 (5.5%) patients had acalculary cholecystitis, and 2 (1.5%) patients presented with liver abscess. Out of 198 patients 36 (18%) patients presented with pancreatic disease. Khuroo MS et al.²⁶

conducted a study on 500 patients having hepato-biliary-pancreatic ascariasis and they found five clinical presentations in their patients: acute cholecystitis (64 patients), acute cholangitis (121), biliary colic (280), acute pancreatitis (31), and hepatic abscess (4). So our observations were at par with their observations. Out of 130 patients of hepato-biliary disease in present study, 34 (26%) patients required ERCP intervention. Almost similar results were observed by Khuroo MS et al.²⁷ in their study, in which they observed that out of 156 patients with hepato-biliary and pancreatic ascariasis 50 (32%) patients underwent various endoscopic interventional procedures.

In the present study we found that 43 patients (out of these 25 patients were having hepato-biliary and pancreatic disease) needed surgical intervention (laproscopy / laprotomy), either on emergency or elective basis. Wani et al.²⁸ in their study on presentation and management of 204 patients with biliary ascariasis seen over a period of 5 years from a highly endemic area of Kashmir, and they found that most of their patients responded to conservative management and around one-fifth (20%) of all patients require surgery. In our study we observed that marginally less number of patients with hepato-biliary and pancreatic disease needed surgical intervention, the reason being that even difficult cases among these patients were managed by ERCP only. Astudillo JA et al.²⁹ in their study found that, in 12 patients, conservative management was attempted and was unsuccessful. Endoscopic extraction was successful in four of these patients. Six patients underwent laparoscopic cholecystectomy, common bile duct exploration with parasite extraction, and T-tube placement. In our study we did laproscopic surgery in half of our patients with biliary ascariasis in whom endoscopic extraction was unsuccessful, which is at par with their study. Rest of our patients were operated

by laparotomy, as most of them presented to us with acute abdomen like peritonitis, bowel obstruction and meckles diverticulitis.

In present study we found that 20 (10%) patients presented with intestinal obstruction (14 patients with sub-acute obstruction and 6 patients with acute obstruction). Very few studies have been conducted on adults presenting with intestinal obstruction due to ascaris. Mohan lal choudhary et al.³⁰ report an adult with intestinal obstruction due to entangled mass of AL that presented as a lump in right iliac fossa, managed by laparotomy and milking the worms into colon. Mokoena T et al.³¹ also conducted a study on adult patients having intestinal obstruction due to Ascaris worms.

Two patients died in our study, one was having perforation peritonitis and second was having pyogenic cholangitis.

Conclusion

Very few studies have been conducted on adult patients presenting with abdominal complaints due to ascariasis infection. *Ascaris lumbricoides* can present with wide range of clinical symptoms and signs in adult patients, thus posing a big challenge for a physician in diagnosis of the disease. So a clinician in emergency department should consider ascariasis as one of the differential diagnosis in case of acute abdomen in adults in an endemic area, which otherwise he is likely to miss in the first contact.

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List of Figure:



USG showing intestinal ascariasis



USG showing worm in CBD



Worm coming through intestinal perforation



Ascaris coming out through meckle's Diverticulum.



Worm extracted from CBD laproscopically



Ascaris came out along with nasogastric tube