

Early Versus Delayed Deworming in Cases of Roundworm Intestinal Obstruction in Pediatric Population – Experience from a Tertiary Care Centre in the Kashmir Valley

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ABSTRACT

Introduction: Small bowel obstruction is the most common complication of roundworm (*Ascaris lumbricoides*) infestation commonly affecting the pediatric age group. This is a prospective randomised study comparing results of early deworming in children with roundworm induced small bowel obstruction with that of delayed deworming during the course of admission.

Material and Method: From January 2013 to June 2015, 255 patients of acute intestinal obstruction due to ascariasis were admitted. Exclusion criteria included children above 15 years or below 6 months of age, history of surgical intervention or any neurological disorder, clinical features of peritonitis, shock and clinical or radiological evidence of any cause of obstruction other than ascariasis. Children included were randomized into early deworming group (EDG) and delayed deworming group (DDG). Cases in EDG were managed by nasogastric suction, parenteral fluid resuscitation, deworming at the time of admission with Albendazole followed by first distal enema after 6 to 8 hours. In delayed deworming group (DDG), deworming was withheld until obstruction was relieved with nasogastric decompression and distal enemas every 6 to 8 hours or due to surgical interventions.

Results: Out of 255 admitted children, 252 (138 males and 114 females) were included in the study; 3 children proved to have causes other than worm obstruction were excluded. Mean age was 5.8 years and mean follow-up was 17 months. The two groups (EDG = 123, DDG = 129) were comparable in age, sex and symptoms and signs at the time of presentation. Mean time to the first feed was significantly reduced in EDG as compared to DDG (20.18 ± 11.21 hours vs 49.37 ± 9.45 hours; *p* value < 0.05).

Conclusion: Contrary to belief that early deworming during hospital admission increases the incidence of obstruction, the same does not hold true in practice. Early deworming should be encouraged as it decreases the morbidity, cost and the hospital stay significantly with no significant increase in the incidence of complications.

Keywords: Ascariasis, Deworming, Roundworm obstruction, Albendazole

emergency.³⁻⁹ Most of the worm obstructions are managed conservatively with close monitoring for the development of severe complications. The conservative management in uncomplicated worm obstruction includes restricting oral feeding, nasogastric suction, repeated enemas, fluid resuscitation, electrolyte replacement, antibiotic coverage and analgesics.⁸⁻¹³ Deworming by anthelmintic agents during the course of admission for acute roundworm obstruction has been controversial.⁸⁻¹¹ We present our experience with management of acute roundworm intestinal obstruction in children by comparing the results of deworming early in the course of admission with that of delayed deworming, a prospective study over two and a half years.

MATERIAL AND METHODS

From January 2013 to June 2015, 225 patients of acute intestinal obstruction due to ascariasis were admitted in one among six surgical units of Government Medical College Srinagar, Kashmir. All children diagnosed on clinico-radiological evidence were included in the study after permission from the hospital ethical committee. Exclusion criteria on admission included children above 15 years or below 6 months of age, history of surgical intervention or any neurological disorder, clinical features of peritonitis, shock and clinical or radiological evidence of any cause of obstruction other than ascariasis. Any patient initially included in the study as roundworm obstruction was later excluded if the cause proved other than intestinal ascariasis or if contributing causes of obstruction were present.

Colicky abdominal pain, abdominal distension, localized or diffuse abdominal tenderness, vomiting with or without worms in the vomitus, palpable worm masses, and empty rectum on digital rectal examination were the main clinical features. Abdominal radiography and ultrasonography con-

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INTRODUCTION

Roundworm infestation (ascariasis) has plagued mankind since times immemorial and the valley of Kashmir, the heaven of ascariasis, is no exception. Intestinal obstruction is the commonest surgical complication of ascariasis, especially in children.¹⁻¹³ In Kashmir ascariasis related complications account for 50 to 60 percent of admission in pediatric surgical

firmed worm masses causing signs of bowel obstruction. Two groups were assigned by randomization using lottery method, with written consent from parents after explaining in detail the option of the treatment. All the patients in early deworming group (EDG) were managed by nasogastric suction (in cases of significant bowel distension and/or vomiting), parenteral fluid resuscitation, deworming at the time of admission with Albendazole suspension (Zentel®, 400 mg/10 ml, GlaxoSmithKline, India) followed by first distal enema after 6 to 8 hours. Albendazole suspension (400 mg above 2 years and 200 mg below 2 years of age, respectively) was given either orally or instilled through nasogastric tube. In delayed deworming group (DDG), deworming was withheld until obstruction was relieved with nasogastric decompression and distal enemas every 6 to 8 hours or due to surgical interventions. Surgical intervention was done if obstruction was not relieved by conservative management for 96 hours or earlier in case of deterioration in clinical condition, warned by tachycardia, tachypnea, fever, abdominal tenderness, and vomiting. All the patients who were discharged were followed at least for 6 months. Deworming was repeated at 3 months in every patient.

Outcome measures to compare the results included time taken, in hours, from admission to first oral feed (started on passage of flatus, stool and/or worms), total hospital stay and the surgical intervention needed in each group.

STATISTICAL ANALYSIS

Data were prospectively entered into SPSS software. Student's *t* test and χ^2 test were used for data analysis. *P* value of < 0.05 was considered significant.

RESULTS

Table 1 compares the results in two groups in terms of the outcome measures. Out of 255 children admitted as worm induced small bowel obstruction, 252 (138 males and 114 females) were included in the study; 3 children proved to have causes other than worm obstruction were excluded. All the patients were aged between 6 months and 15 years (mean 5.8 years). The two groups (EDG = 123, DDG = 129) were comparable with regard to age, sex and symptoms and signs at the time of presentation. Mean follow-up was 17 months. The mean time taken from admission to the first oral feed started was found significantly reduced in EDG as compared to DDG (20.18 ± 11.21 hours vs 49.37 ± 9.45 hours; *p* value < 0.05). The mean hospital stay was 30.54 ± 10.31 hours in EDG and 74.59 ± 6.7 hours in LDG. The difference was statistically significant (*p* value < 0.05). Out of 123 patients in the early deworming group, 8 patients required surgical intervention; 3 patients required enterotomy for retrieval of

worms and in other 5 milking of worms was done. In delayed deworming group (n = 129), 11 patients required surgical intervention; enterotomy in 6; milking of worms in 4 and one required resection and anastomosis of gangrenous gut. Three patients which were earlier included as cases of worm obstruction were later excluded. One with paraduodenal hernia was from EDG and the other two with congenital terminal ileal bands in association with worm obstruction were from DDG. The difference between surgical interventions in two groups was not statistically significant (*p* value > 0.05).

DISCUSSION

Ascaris lumbricoides (roundworm) is the largest and most prevalent of the human helminths and is more prevalent in tropical and subtropical climates. In Southeast Asia, 42 to 92% of the population is infested.¹¹ Ascariasis can cause serious intra-abdominal complications such as intestinal obstruction, biliary obstruction, cholangiohepatitis, liver abscess, pancreatitis, acute appendicitis, intestinal perforation, and granulomatous peritonitis.⁶⁻¹⁹ Luminal obstruction is the most common complication of round worm infestation and more so in children attributable the narrower intestinal lumen.^{7,10} The obstruction is caused by an entanglement of worm boluses and spasmodic contraction of the small bowel on to a mass of worms with effectual obstruction at the ileo-cecal valve, augmented by inflammation and matting of loops of the bowel at the site occupied by worms.¹¹ This can lead to severe sequelae like volvulus, intussusception, gangrene etc.¹⁰⁻¹⁴

Most of the children with round worm induced bowel obstructions respond to the conservative management with surgical management reserved for complicated cases.⁸⁻¹³ Keeping the child nil by mouth for a longer time, while on intravenous fluid therapy, is believed to starve the worms resulting their disentanglement and passing down as smaller non-obstructive boluses.⁷⁻¹⁰ Hypertonic saline enemas are then used to expel them from the colon.⁷⁻¹³ Water soluble contrast orally or through nasogastric tube has been successfully used to disentangle worm boluses utilizing its hygroscopic and lubricating features.^{20,21}

Early deworming during the course of admission has remained a controversial subject due to available reports that it can exaggerate obstruction. Some authors believe that using antihelminthic agents during the course of conservative management alters the motility of the worms and hampers their clearance leading to serious complications like intussusceptions, volvulus, haemorrhagic or necrotic bowel and even perforation.^{22,23}

We studied deworming early at the admission based on the hypothesis that movement of worms down the lumen is only passive rather than active. This forms the basis for de-

Outcome measures	Early deworming group (EDG) n=123	Delayed deworming group (DDG) n=129	Mean difference	P value
Mean time (in hours) from admission to first oral feed	20.18 ± 11.21	49.37 ± 9.45	29.19	<0.05
Mean hospital stay (in hours)	30.54 ± 10.31	74.59 ± 6.7	44.05	<0.05
Surgical intervention needed	8	11	3	>0.05

Table-1: Comparison between outcome measures in two groups.

worming in all cases of worm infestations. Worms can be pushed down by peristalsis only when paralysed or dead. Also worms cannot be washed down by enemas unless they reach the colon. We used Albendazole with a purpose to induce flaccid paralysis followed by the death of the round worms. Albendazole acts upon microtubules in cytoskeleton and block the transport secretory granules and movements of other sub-cellular organelles leading to flaccid paralysis followed by death secondary to decreased ATP production. The dead worms slip off from the worm bolus one by one forming smaller boluses which can negotiate the intestinal lumen with ease and thus relieving the obstruction. We did not use Piperazine citrate for its disrepute to cause toxicity leading to its removal from the markets in developed countries.²⁴ A time gap of about 6 to 8 hours between ingestion of deworming agent and the enema allows the paralysed or dead worms reach the colon to be effectively washed by the enema fluid. The benefits of early deworming in our study, contrary the earlier belief,^{22,23} can be explained by exploiting the effective peristalsis struggling against obstructing worm boluses while getting worms paralysed/killed early in the course of admission. Living round worms continue to stay in the small bowel against the peristalsis and can be expelled only when pushed down into the colon. Also delayed oral feeds in late deworming cases potentially can increase the chances of hypokalemia and, hence, decrease in peristalsis. Prolonged wait also, theoretically, can exhaust the small bowel enough and reduce the effective peristalsis.

CONCLUSION

Round worm infestation is the commonest cause of small bowel obstruction in endemic areas like Kashmir valley. Early deworming in the course of admission with Albendazole relieves the obstruction early and allows early oral feeding and discharge from the hospital. This, in turn, decreases the morbidity and loss of school days in the patients, bed occupancy in the hospitals and economic burden on the society. On the basis of this comparative study, we recommend early deworming during hospital admissions followed by deworming at regular intervals of three to six months.

REFERENCES

- Coflkun A, Ozcan N, Durak AC, Tolu I, Güleç M, Turan C. Intestinal ascariasis as a cause of bowel obstruction in two patients: sonographic diagnosis. *J Clin Ultrasound* 1996;24:326-8.
- Villamizar E, Méndez M, Bonilla E, Varon H, de Onatra S. *Ascaris lumbricoides* infestation as a cause of intestinal obstruction in children: experience with 87 cases. *J Pediatr Surg* 1996;31:201-4.
- Khuroo MS. Ascariasis. *Gastroenterol Clin North Am* 1996;25:553-77.
- Malik AH, Saima BD, Wani MY. Management of hepatobiliary and pancreatic ascariasis in children of an endemic area. *Pediatr Surg Int* 2006;22:164-168.
- Baba AA, Ahmad SM, Sheikh KA. Intestinal ascariasis: the commonest cause of bowel obstruction in children at a tertiary care center in Kashmir. *Pediatr Surg Int* 2009;25:1099-102.
- Wani I, Rather M, Naikoo G, Amin A, Mushtaq S, Nazir M. Intestinal ascariasis in children. *World J Surg* 2010;34:963-8.
- Mishra PK, Agrawal A, Joshi M, Sanghvi B, Shah H, Parelkar SV. Intestinal obstruction in children due to Ascariasis: a tertiary health centre experience. *Afr J Paediatr Surg* 2008;5:65-70.
- Tondon A, Choudhury SP, Sharma D, Raina VK. Hypertonic saline enema in gastrointestinal ascariasis. *Indian J Pediatr* 1999;66:675-680.
- Surendran N, Paulose MO. Intestinal complications of round worms in children. *J Pediatr Surg* 1988;23:931-935
- Mokoena T, Luvuno FM. Conservative management of intestinal obstruction due to *Ascaris* worms in adult patients: a preliminary report. *J R Coll Surg Edinb* 1988;33:318-21.
- Louw JH. Abdominal complications of *Ascaris lumbricoides* infestation in children. *Br J Surg* 1966;53:510-21.
- Wynne JM, Ellman BA. Bolus obstruction by *Ascaris lumbricoides*. *S Afr Med J* 1983;63:644-6.
- Akgun Y. Intestinal obstruction caused by *Ascaris lumbricoides*. *Dis Colon Rectum* 1996;39:1159-63. Wiersma R, Hadley GP. Small bowel volvulus complicating intestinal ascariasis in children. *Br J Surg* 1988;75:86
- Ochoa B. Surgical complications of ascariasis. *World J Surg* 1991;15:222-7.
- Thein-Hlaing. A profile of ascariasis morbidity in Rangoon Children's Hospital, Burma. *J Trop Med Hyg* 1987;90:165-9.
- Ghawss MI, Willan PL. Subacute non-bolus intestinal obstruction caused by *Ascaris lumbricoides*. *Br J Clin Pract* 1990;44:243-4.
- Katz Y, Varsano D, Siegal B, Bar-Yochai A. Intestinal obstruction due to *Ascaris lumbricoides* mimicking intussusception. *Dis Colon Rectum* 1985;28:267-9.
- Archibong AE, Ndoma-Egba R, Asindi AA. Intestinal obstruction in southeastern Nigerian children. *East Afr Med J* 1994;71:286-9.
- Wiersma R, Hadley GP. Small bowel volvulus complicating intestinal ascariasis in children. *Br J Surg* 1988;75:86-7.
- Bar-Maor JA, de Carvalho JL, Chappell J. Gastrografin treatment of intestinal obstruction due to *Ascaris lumbricoides*. *J Pediatr Surg* 1984;19:174-6
- Hamid R, Bhat N, Baba A, Mufti G, Khursheed S, Wani SA, Ali I, Hassan F. Use of Gastrografin in the management of worm-induced small bowel obstruction in children. *Pediatr Surg Int* 2015;31:1171-6.
- Vasquez Tsuji O, Gutierrez Castellon P, Yamazaki Nakashimada MA, Arredondo Suarez JC, Campos Rivalar T, Martinez Barbosa I. Anthelmintics as a risk factor in intestinal obstruction by *Ascaris lumbricoides* in children. *Bol Chil Parasitol* 2000;55:3-7.
- Rodriguez-Garcia AJ, Belmares-Taboada J, Hernandez-Sierra JF. *Ascaris lumbricoides*-caused risk factors for intestinal occlusion and subocclusion. *Cir Cir* 2004;72:37-40.
- Crompton D. How much human helminthiasis is there in the world? *J Parasitol* 1999;85:397-403.

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