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Intestinal Ascariasis in Nigerian Children

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Ascariasis (roundworm) is the commonest intestinal parasite. It affects patients of all ages and most systems of the body. Though the infestation is world-wide, it is more prevalent in tropical countries and especially under conditions of poor personal hygiene and soil pollution. There is now increasing awareness among parents in our environment of the harmful effects on children of this intestinal parasite. Many symptoms such as abdominal colics and cramps, failure to thrive, visible peristalsis, grinding of teeth, anaemia, intestinal noises, offensive stools, etc., have been associated with these worms, and parental medication of children with vermifuge has consequently become a common practice. This review highlights the danger of the one-dose vermifuge in the patient with a high population of intestinal ascarids, and attempts to explain the age prevalence of the infestation in children.

Methods and Management

Records were obtained of 150 children with established intestinal ascariasis seen at the University of Nigeria Teaching Hospital (UNTH) between January 1976 and December 1979. One hundred and ten children were treated as out-patients, and 40 patients were hospitalized. Patients treated and discharged from the casualty department have been excluded from the series as most of them did not conform to the criteria set below. Excluded also were cases of incidental findings of the nematode in the intestine of patients being treated for other conditions. Patients included in the series were those with abdominal symptoms (Fig. 1) in whom a diagnosis of the intestinal worm was made according to any one of the following criteria:

(i) Vomiting of ascarid worm.
(ii) Passage of ascarid in faeces.
(iii) Palpation of worms in the rectum on digital examination.
(iv) Microscopic diagnosis of the ova of ascarid in stool.

The cases were analysed with respect to the age incidence, symptomatology, and surgical management.

Results and Interpretation

Age Incidence

The age incidence (Fig. 2) is conveniently grouped into three age ranges:

Group A (1-2 years): This group has the lowest incidence of intestinal ascariasis, 4 per cent. These children feed mainly on breast and other milk. They are carried, tied on the back, and protected most of the time so that contamination is low. The incidence of acquired diseases is also low among these children.

Group B (3-7 years): The highest incidence, 74 per cent of childhood intestinal ascariasis is obtained in this age group. These are mostly school children in nursery and early primary schools. They are less protected and left on their own most of the time. They are often in contact with the soil at school and at playgrounds. They eat indiscriminately. At home, ignorant housemaids increase their exposure to contaminated foods. Acquired diseases and malnutrition are also common among these children.

Group C (8-12 years): These are more mature children. The knowledge and practice of hygiene is higher. They are less in contact with polluted soil. Most of these take care of themselves and do not depend on housemaids. The incidence of intestinal ascariasis in this group is 22 per cent.

Symptomatology

The symptoms commonly presented by these patients were colicky abdominal pain, vomiting,

![Fig. 1. Symptoms.](attachment:image)

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constipation, and diarrhoea. Figure 1 shows the frequency of these symptoms. The commonest symptom, abdominal colic, could be due to spasm or obstruction of the bowel. Vomiting occurred in 86 per cent of patients. This could be due to a reflex pylorospasm induced by the massive movement of the ascarids along the bowel. Vomiting, however, becomes established when the small bowel is mechanically obstructed by a mass of entangled ascarids. The vomitus may sometimes contain ascarids thus alerting the parents to the intestinal infestation. Fifty-four per cent of children had constipation and 28 per cent had watery stools. Discovery of the infestation is also commonly made by passing some ascarids in faeces.

A previous history of the infestation is common. Other clinical features of interest were the occasional occurrence of pyrexia, leukocytosis, and abdominal mass. Some infants with intestinal obstruction and a palpable mass in the right side of the abdomen presented a diagnostic problem in differentiating between intussusception and helminthic obstruction. The diagnosis of several such cases was confirmed at laparotomy.

**Surgical management**

Sixteen patients (10.7 per cent) were admitted as surgical emergencies. Fourteen of these had intestinal obstruction, one had peritonitis, and one had acute appendicitis. The surgical management was as follows:

- **Conservative management** 8 cases
- **Laparotomy and massage** 5 cases
- **Laparotomy and peritoneal toilet** 1 case
- **Enterotomy** 1 case
- **Appendectomy** 1 case

We had no case of volvulus, and ascarids in association with intussusception, band obstruction, and other surgical conditions have not been included in this series.

**Conservative management**

This was initially instituted in all the 14 cases of intestinal obstruction, but only 8 of them responded to it. The conservative management included mainly the establishment of a continuous nasogastric drainage to empty the stomach and keep it decompressed; and an intravenous infusion. The intravenous infusion was guided by the degree of dehydration, serum urea and electrolytes, and urinalysis. Antibiotics, analgesics, and sedatives were given as necessary. When the obstruction had subsided and oral feeding commenced, the patients were gradually dewormed. The anthelmintics used commonly were pyrantel pamoate, piperazine, and tetramisole. These were given, not as a bolus therapy, but in divided doses over a period of two to three days.

**Laparotomy and 'massage'**

Five patients with intestinal obstruction who did not respond to conservative management required laparotomy and massaging of worms. At laparotomy obstruction caused by a mass of entangled ascarids was commonly seen at the terminal ileum towards the ileo-caecal junction. Other areas commonly obstructed were the duodeno-jejunal junction, the jejunum and the ileum. These worms were disentangled and dispersed by massaging or milking along the length of the gut in order to relieve the obstruction. This process had to be meticulously done to avoid denuding the bowel wall. Post-operatively, the patients were continued on naso-gastric drainage and intravenous infusion. When oral feeding was commenced, the patients were gradually dewormed.

**Enterotomy**

One patient required an enterotomy to evacuate the obstructing ascarids. This was a 3 year old male child of a company manager, whose mother was away in the Youth Corps as a part of national service at the time, and who was looked after by housemaids. He had vomited ascarid worms and was given 15 ml of pyrantel pamoate (Combantrin) as a single dose at home. About five hours later, he was admitted to the University of Nigeria Teaching Hospital Enugu with intestinal obstruction. He had six hours of conservative management during which he deteriorated. His abdomen remained tensely distended. A tender mass was palpable in the right iliac fossa. At laparotomy, there was free cloudy peritoneal fluid, distended loops of bowel proximal to the obstruction, and 30 cm of the ileum from the ileo-caecal junction was densely packed with ascarid worms in a leadpipe fashion. Massaging to disperse the worms was unsuccessful. An enterotomy was made at about 15 cm from the ileo-caecal junction and 284 adult ascarid worms were evacuated. The enterotomy was closed in two layers. Post-operatively, he was gradually dewormed.
Laparotomy and peritoneal toilet

One patient with peritonitis was found at laparotomy to have an adult worm lying free in the peritoneal cavity. No exit was found in the gut. The peritoneum contained inflammatory exudate and though there were a few worms observed in the bowel, there was no obstruction of the bowel. The presence of the ascarid in the peritoneal cavity was responsible for the peritonitis which was diffuse.

Appendicectomy

One patient who had acute appendicitis had an ascarid worm in the lumen of the appendix which was removed at appendicectomy. The appendix showed basal obstruction and distal dilatation. There were also a few scattered ascarids in the lumen of the small intestine. The patient was dewormed post-operatively.

Discussion

Though ascarids have merited wide publicity in the past, the infestation has not shown much of a downward trend. It is still the commonest abdominal parasite in children in our environment. It may exist alone, co-exist with other parasites, cause diseases, or encourage other diseases. It is unusual for a few roundworms in a well-nourished child to produce any ill effect.

Age prevalence

The 3–7 year old children have the highest incidence of intestinal ascariasis. A bolus dose of vermifuge prior to the operation is advocated. Health education in schools should be encouraged and education of housemaids who look after young children is particularly important.

Surgical ascariasis

Apart from obstruction, peritonitis, and appendicitis, intestinal ascariasis can manifest as volvulus, spasm, and inflammation. Ascarids can cause gangrene of the gut most commonly at the anti-mesenteric border and as in the case of all devitalized gut resection an anastomosis is the treatment of choice. Louw reported a case of a 10 year old child who died of a gangrenous volvulus containing 200 roundworms. Ascarids may be found in association with intussusception or band obstruction. Girges suggested that the irritating effect of worms in the intestine may stimulate hyper-peristalsis and thus initiate intussusception or volvulus. Intussusception occurs more commonly in our 1–2 year age group than in our 3–7 or 8–12 year age groups and one is more inclined to agree with Cole that ascarids appear to congregate at the scene of any pathology.

Worm obstruction of the gut can occur in any area of the small intestine including the duodenum. The ileo-caecal junction being the narrowest part of the intestine is most commonly affected. The jejunum however is a more favourable habitat than the ileum because the ridges in the mucosa offer the ascarids a better anchoring surface than the smoother walls of the ileum. Ascarid obstruction of the colon is very rare. The nematodes may perish in the colon as they are unable to nourish themselves on the contents of the colon; and mixed with faeces, they cannot resist being emptied out during defecation.

Drug-induced obstruction

All our 14 cases of intestinal obstruction had each received a bolus dose of vermifuge prior to the obstruction. Our observation suggests that the one dose vermifuge in an intestine highly populated with ascarids can induce intestinal obstruction. Makindono observed that after a vermifuge had been administered, the bodies of ascarids in the intestine became flaccid and were passively propelled down the small intestine by peristalsis; their flaccid bodies being bent into a U with the head and tail ends pointing to the distal end of the intestine. It is suggested that the child who vomits or passes a roundworm in the stools should be considered to carry a high population of the parasite in the gut and should be dewormed in stages; in other words, the calculated dose of the vermifuge should be given in divided dosage over a period of days.

Summary

One hundred and fifty children, aged between 1–12 years, with established intestinal ascariasis, were seen at the University of Nigeria Teaching Hospital (UNTH), Enugu within the four-year period, January 1976 to December 1979. The highest incidence (74 per cent) occurred in children aged between 3–7 years. The infestation was rare in the 1–2 year age group (4 per cent). The commonest symptom was abdominal colic. Although 26.7 per cent of patients required hospitalization, surgical treatment became necessary in only 5.3 per cent.

References