Abstract: Blood and mucus diarrhea is a common condition encountered in pediatric practice. Though most of the cases were of acute nature, due to infective and allergic causes and amenable to treatment, some children present with persistent symptoms that require thorough systematic evaluation to identify the cause. We present case series of 9 children from 2006-2010, with persistent blood and mucus diarrhea who were diagnosed as Trichuris dysentery syndrome (TDS), after ruling out other causes. These children were treated with albendazole for a total period of 10 days along with proper nutritional supplementation and achieved complete recovery with no recurrence on follow-up.

Keyword: trichuriasis, blood and mucus, children

Introduction:
Blood and mucus diarrhea in children is a common problem with varied etiology. The cause of blood and mucus diarrhoea in Infants include conditions like invasive diarrhea, intussusception, cows milk protein intolerance and in older children, the common conditions include polyps, solitary rectal ulcer, fissure in ano (in those who are constipated) and rarely, conditions like inflammatory bowel disease, TB, AIDS especially in the presence of constitutional symptoms. Some of the conditions were peculiar to tropical countries especially in undernourished children. Worm infestations may cause rectal bleeding in children. We report 9 cases of trichuriasis hyperinfestation, presented with persistent blood and mucus diarrhea.

Case series of 9 children from low socio-economic status, who were referred for persistent Blood & Mucus diarrhea (duration > 14 days) were shown below. All these children were evaluated for infective cause, tuberculosis, allergic colitis and inflammatory bowel disease. HIV screening was done in all these children and found to be negative. All the investigations were inconclusive and fecal smear showed eggs of trichuris trichiura in only 4 children (<10/ smear). Colonoscopy was performed in all these children to rule out above mentioned causes with biopsy under colonoscopic guidance. But colonoscopy revealed worm hyperinfestation which was found to be trichuris trichiura on examination. Biopsy findings from mucosal...
lesions showed nonspecific inflammatory reaction with no evidence of TB/IBD and other above mentioned causes. Repeat examination of fecal smear by concentration methods too supported hyperinfestation in all these children (> 50 eggs/smear). All these children were treated with antihelminthic drugs for a period of 10 days with nutritional supplementation and achieved complete recovery as evidenced by remission of symptoms and negative fecal smear with concentration methods on monthly followup for six months.
Whipworm, hookworm, and Ascaris are known as soil-transmitted helminthes. Together, they account for a major burden of disease worldwide. An estimated 1.049 billion persons harbour T. trichiura, including 114 million preschool-age children and 233 million school-age children. The prevalence of T. trichiura is high and may reach 95% in children in many parts of the world where protein energy malnutrition and anaemias are also prevalent and access to medical care and educational opportunities is often limited.

Maximum prevalence (90%) of both Ascaris and Trichuris infections is usually attained before 5 years of age. Prevalence of trichuriasis is 50 to 80 percent in Asia and South East United States, especially in tropical regions with poor sanitary facilities. Extremely high prevalence rates have been described among fishing communities in South India. A study showed a prevalence of 71% for trichuriasis in children belonging to fishing communities in

<table>
<thead>
<tr>
<th>Colonoscopy findings</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hyperinfection</td>
<td>9 (100%)</td>
</tr>
<tr>
<td>Multiple superficial ulcers</td>
<td>3 (33%)</td>
</tr>
<tr>
<td>Fissure in ano</td>
<td>1 (11%)</td>
</tr>
<tr>
<td>Ano rectal polyp</td>
<td>1 (11%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albendazole</td>
<td>400 mg orally stat dose for 3 days (hyperinfection)</td>
</tr>
<tr>
<td>Mebendazole</td>
<td>100 mg orally twice a day for 3 days, repeat after 2 weeks (hyperinfection)</td>
</tr>
<tr>
<td>Nitazoxanide</td>
<td>5-10 mg kg for 3 days for 3 days (hyperinfection)</td>
</tr>
</tbody>
</table>

An Initiative of The Tamil Nadu Dr. M.G.R. Medical University
University Journal of Medicine and Medical Sciences
An Initiative of The Tamil Nadu Dr. M.G.R. Medical University
University Journal of Medicine and Medical Sciences

vishakapatnam with hyperinfestation and 50% showing chronic dysentery, growth retardation and anaemia. Similar prevalence rates were described by another study in a community in Vairavankuppam in Tamil Nadu. Latrine facilities in these communities are described as non-existent and children were observed to defaecate and play in the school grounds.

Trichuriasis is a parasitic infection primarily in the tissue of the cecum, appendix, colon and rectum that is caused by Trichuris trichiura (whipworm). Trichuris trichiura is the third most common nematode of humans.

RESERVOIR:
Humans are the only known reservoir.

VECTOR:
Non-biting cyclorrhaphan flies (Musca domestica, Chrysomya rufifacies, Musca sorbens, Lucina cuprina, Calliphora vicina, Chrysomya bezziana and Wohlfarthia magnifica) have been found to carry Trichuris trichiura. A study in Ethiopia found cockroaches as carriers for several human intestinal parasites, including Trichuris trichiura.

ROUTE OF TRANSMISSION:
Humans can become infected with the parasite due to ingestion of infective eggs by mouth, contact with hands or food contaminated with soil containing eggs. Contaminated vegetables have caused major outbreaks.

There have also been rare reported cases of transmission of trichuris trichiura by sexual contact.

INCUBATION PERIOD:
The exact incubation period of Trichuris trichiura is unknown however immature eggs in soil take about three weeks to mature (15–30 days), 10 days minimum to mature before ideal ingestion by the human host.

LIFE CYCLE:
Once ingested, the larva will remain dug into a villus in the small intestine for about 2–3 days until it is fully developed for migration to the ileocaecal region of the gastrointestinal tract and cause symptoms. Each adult worm sucks 0.005 ml of blood/day. Female worms lays 5000-20000 eggs/day which were shed in feces.

ADULTWORM: The whipworm derives its name from its characteristic whiplike shape. Adult males of Trichuris trichiura are 30-45 mm long with a coiled posterior end. Adult females are 35-50 mm with a straight posterior end. Both sexes have a long, whip-like anterior end. Adults reside usually in large intestine, cecum and appendix and in hyperinfestation, reside in the rectum too. Adult worm buries its thin threadlike anterior half into the intestinal mucosa and feeds on tissue secretions and blood.

EGG:
It is barrel or spindle in shape and 20-50 mm in size. It is brownish and has a translucent polar plug at either end. The content of the egg is an undeveloped cell.

CLINICAL FEATURES: Light infestations are frequently asymptomatic (have no symptoms). Hyper infestations, especially in small children, can present with gastrointestinal problems including abdominal pain and distention, blood and mucus diarrhea, tenesmus (feeling of incomplete defecation, generally accompanied by involuntary straining), appendicitis may be brought on (by damage and edema of the adjacent lumen) if there are large numbers of worms or larvae are present. The Trichuris dysentery syndrome (TDS) associated with T. trichiura hyperinfestation, which includes chronic dysentery, rectal...
prolapse, anaemia, poor growth, and clubbing of the fingers constitutes an important public health problem. Profound impact of TDS on childhood physical and mental health, occurs only among the roughly 15% of Trichuris infected children with the heaviest worm burdens (3% of all children with chronic dysentery) 7,10. Another study determined that significant effects (chronic dysentery) occur with worm burdens of just a few hundred or less. (2.5% of all children with chronic dysentery). It is seen in 30% of children aged 1-5 years with trichuriasis 9. It does not commonly cause eosinophilia.

INVESTIGATIONS
Eggs and charcot-leyden crystals can be demonstrated in feces by floatation method. By direct fecal smear: Egg count can be done to diagnose light infestation (<10 eggs/smear) & in heavy infestation (>50 eggs/smear) The diagnosis of a massive Trichuris trichiura infestation as the cause of the persistent blood & mucus diarrhea was only reached by colonoscopy, which shows worms attached to the mucus membrane or sometimes intact worms may be passed out in the feces. Prolonged regimens of albendazole may be required to the effective treatment of massive infestations. (10 days) 8

PREVENTION & CONTROL:
Training adults and children in proper sanitary disposal of feces and washing of hands is necessary. Treating water sources before use and wearing foot wear. Avoid living in overcrowded places and using human feces as fertilizer on farms. Health and Nutritional education

CONCLUSION:
Eventhough the causes of blood and mucus diarrhea were numerous, infective (bacterial/viral), inflammatory (IBD), Tuberculous/Hiv, and Allergic colitis should be ruled out in any child presenting with persistent blood and mucus diarrhea. In developing countries like India especially in rural areas, with poor sanitary practices, hyperinfestation with trichuriasis should be considered, especially in the absence of or minimal systemic symptoms with malnutrition and
micronutrient deficiencies. Trichuriasis hyperinfestation can be confirmed by colonoscopy and fecal smear. (Concentration methods with iodine stained preparation were often required, since routine fecal smears may miss hyperinfestation (>50 eggs / smear) and treatment with antihelminthic drugs for a period of 10 days is essential for complete recovery in our experience, as evidenced on followup examination.

Bibliography

1. (Bethony et al., soil transmitted helminth infections: ascariasis, trichuriasis, & hookworm. Lancet 367:1521, 2006)

2. L.S. Stephenson, C.V. Holland and E.S. Cooper et al Parasitology. 2000; 121 Suppl:S73-95


11. (Text book of parasitology: Ananthanarayanan & Panickar

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albendazole</td>
<td>400 mg orally stat dose... 3 days (or hyperinfestation)</td>
</tr>
<tr>
<td>Mebendazole</td>
<td>100 mg orally twice a day for 3 days. repeat after 2 weeks (hyperinfestation)</td>
</tr>
<tr>
<td>Nitazoxanide</td>
<td>1-3 yrs: 100mg bid 4-11 yrs: 200 mg/day Adults/Adults: 500 mg bid for 3 days</td>
</tr>
</tbody>
</table>