

Worm Infestation in Children

Written by Dr Anil Mokashi
Monday, 14 June 2010 16:55 -

Worm infestation constitutes an important limitation on growth and development of children. In children with borderline nutritional status, worms can precipitate nutritional failure.

Knowing size, shape of worms, larvae and eggs was important when treatment for each worm was different. With availability of broad spectrum antihelmintic drugs, it is not necessary that one should know morphology in details. Instead we should concentrate on the clinical pattern and drug details. Knowledge of breaking the life cycle is important from prevention point of view.

We will discuss the worms problem under following headings 1) Disease Picture 2) Diagnosis 3) Drugs 4) Prevention.

1. Disease Picture

The hookworm and roundworm are the most important worms producing serious disease in children. In some regions tapeworm is common. The threadworm though common is never a serious problem. Number of worms living in a child is called as worm load. A heavy worm load usually causes symptoms. A light worm load may be asymptomatic.

Parasitic infection differs from viral or bacterial infection. One virus or bacterium can

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develop into millions after entering the body. On the other hand on parasitic larva grow into only one adult worm. So the size of a child's worms load depends on how many larvae get into him.

Intestinal parasites compete for food, damage the intestine and decrease food absorption. Light round worm infection can lead to 3 % calorie wastage. Heavy infection can lead to caloric loss of 5% of daily consumption (Ref : The state of world's children 1985 Unicef)

1. Round Worms (Ascariasis) :

a) *A few round worms*, in a well fed child usually produce no ill effect and are not noticed until, a worm is passed in stools. Sometimes occasional abdominal pain, vomiting and diarrhea may be produced.

b) *In heavy infections*, intestinal obstruction can occur from a tangle ball of round worms becoming stuck at the ileocecal junction where the lumen is narrowest.

c) *In very heavy infections*, with hundreds of worms, these parasites pose a nutritional threat. *Ascaris* and malnutrition both cause abdominal distension.

d) *Complications due to migration*, of roundworms into the bile passage etc. are probably not very rare. Such migration is promoted by fever, a spicy diet, anorexia, improper treatment by the presence of a single worm or worms of the same sex. In one Indian study round worm was the cause of biliary and pancreatic disease in about 37% of patients. These facts tell us the importance of treating even light or asymptomatic infections.

2. Hook worms (Ancylostomiasis)

The main picture of hookworm disease is caused by prolonged blood loss. The effect of hookworm infection depends on wormload, amount of blood loss and nutritional status of the child (especially iron and proteins).

Few hookworms in a well fed person cause no symptoms (Hookworm infection). In a child there is higher requirement of a proteins for growth and increase in blood volume. A heavy hookworm load during this period causes slowly increasing anemia (Hookworm disease). If untreated this eventually leads to death from heart failure.

3. Threadworms (Enterobiasis).

Perianal itching, long duration and history of similar complains in family is the hallmark of threadworms. It does not cause any serious illness. This infection usually occurs among people living closely together because it can be easily passed from one person to another. Treatment failures are usually due to reinfection rather that failure of treatment.

II) Diagnosis :

Worms are easy to diagnose. A microscope is use to find ova or larvae in the stools. To measure a child's worm load, count all the ova in a fecal smear. Less than 20 ova in a standard fecal smear is a light worm load. Between 20 to 40 ova is a moderate load. More than 40 ova is a heavy load. Threadworms are diagnosed by perianal smear by scotch tape collected in the early morning.

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III) Drugs for worms

There are about 25 antihelintic drugs available in market. Here we will look a few important drugs (Table 1).

Sr	
Worms	
Mebendazole	
Pyrantel	
Piperazine	
1	
Ascaris	
(Roundworms)	
4+	

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3 days

4+

Single dose

2+

2 days

2

Enterobius

(Threadworms)

4+

Single dose

4+

Single dose

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3+

7 days

3

Ancylostoma

(Hookworms)

4+

3 days

4+

3 days

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4

Trichuris

(Whipworms)

4+

3 days

3+

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2+

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(4+=90-100%, 3+=80-89%, 2+=70-79%, 1+=70%)

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1) Mebedndazole : This drug is a broad spectrum of action and virtually no side effects. It is wormicidal. It inhibits glucose uptake in the worm, immobilizes the worms and kills it. Pediatrics clinics of North America (August 84) recommends mebendazole as a drug of choice for roundworms, hookworms & threadworms.

It is available as 100 mgm tablet and syrup. The dose is same for adults and children. For threadworms single 100 mgm tablet of mebendazole is effective. For roundworms and hookworms. 100 mg 3 days. Fasting or purging is not required.

As the drug is not absorbed, mebendazole does not have any systemic toxicity. When there is massive worm infection and expulsion, transient abdominal pain and diarrhea can occur. Worm migration through nose and mouth during mebendazole treatment is a known side effect which occurs due the starvation and slow death of the worm. Very rarely leucopenia has been reported.

Membendazole should not be given in pregnancy and known allergy to the drug. It is not yet recommended for children below 6 months as it is not studied extensively.

2) Pyrantel Palmoate : It is a broad spectrum antihelmintic with efficacy similar to mebendazole. It cause sharp contraction of the worm with subsequent cessation of spontaneous activity with paralysis of worm. PCNA August 85 recommends pyrantel as a drug of choice for round and threadworms. Pyrantel is found equally effective against hookworms as mebendazole.

Pyrantel is effective in the treatment of ascariasis and enterobiasis with a single dose of 10 mg/kg. against hookworm the same daily dosage should be repeated for 3 consecutive days. The adverse reactions are mild and transitory in the form of headache, gastrointestinal disturbances, dizziness rash and fever. This drug is not recommended in pregnancy and under 6 months because of inadequate clinical trials. It is contraindicated in pre-existing liver dysfunction. As there is a possibility of pyrantel and piperazine having antagonistic action, these

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two drugs should not be used together.

3) Piperazine salts : Though highly effective against round worms and threadworms, due to availability of nontoxic drugs (mebendazole) it's use is declining.

It acts by worm paralysis. Anticholinergic action at the myoneural junction and decreased succinic acid production causes narcosis of the worm. In this way worms lose their ability to retain their position against intestinal peristalsis. The worms are carried down passively and expelled out. Use of purgatives is not necessary. On the contrary purgative enhance peristalsis and promote rapid drug excretion.

Piperazine is mainly used against ascaris and enterobius. It's efficacy is inferior to mebendazole, pyrantel and tetramisole. 50 mg piperazine, per kg body weight per day is given for 2 days for round worms. Maximum dose is 3.5 gms. For threadworms it is to be given for 7 days.

Incidence of side effects to piperazine is much more as compared to mebendazole and pyrantel. Gastrointestinal disturbances, blurred vision, muscle weakness, ataxia, nystagmus, inco-ordination, convulsions and urticaria are the reported side effects. Piperazine should not be given in epilepsy, renal and liver disorders.

4) Niclosamide : It is particularly useful against all types of tapeworms. Under the effect of niclosamide, worm becomes susceptible to the proteolytic action of intestinal secretions. Dose for children is 2 tables (Total 1 gram) to be chewed or swallowed on empty stomach. Purgation is recommended after 1 hour to expel the worm and prevent the complication of cysticercosis.

5) Other Drugs : There are many other drugs which are not used now-a-days. Tetramisole, levamisole, thiabendazole, pyrivinium bephenium hydroxynaphtoate and many more drugs though useful are not considered here as better, safer and broader action drugs are available. Due to availability of broad spectrum drugs now it is not necessary to have a precise diagnosis of individual parasite.

IV) Prevention :

Treating a child for worms gives us an opportunity to tell mother how to prevent the disease. Infective role of stools is to be emphasized. Washing of vegetable and roots in cleat water, eating and preparing food with clean hands, water and proper excreta disposal are the most effective measures to control ascariasis: periodic deworming (at 6 month interval) is no feasible for mass treatment. For enterobius infection, keeping the nails trimmed and clothes clean may prevent reinfection. Nelson's textbook (12th ed.) says "though personal cleanliness is a good general recommendation, there is no proof that it plays a significant role in control of enterobiasis." For prevention of hookworms infestation is an useful advice.

Conclusion : Worms affect nutritional status, growth and development. That should be our primary concern. We should not worry much about worms causing pain in abdomen, recurrent cold and cough, white patches on face etc. Although such symptoms are found in patients with intestinal worms, their presence is not diagnostic of worm infection.