Committee on Drugs

Commentary on Anthelmintics

Nematode infestation of children in the North American hemisphere is a common problem, although it is not of the magnitude in this area that it is in some other areas of the world. Patients who harbor roundworms are frequently asymptomatic. However, appropriate treatment is required when clinical symptoms occur and significant infestation is found. Correct diagnosis is of paramount importance because choice of the proper drug is predicated on knowledge of the infecting organism.

The two roundworms most commonly seen in the United States are *Enterobius vermicularis* (pinworm) and *Ascaris lumbricoides* (large roundworm). In warmer climates infestation with *Toxocara canis, T. cati* (visceral larva migrans), *Trichuris trichiura* (whipworm), *Necator americanus, Ancylostoma duodenale* (hookworm), and *Strongyloides stercoralis* occurs. This commentary is limited to the treatment of *A. lumbricoides* and *E. vermicularis* infestations because of their widespread occurrence.

*Enterobius vermicularis* is probably the most ubiquitous parasite in the United States and Canada. In contrast to most other helminthic infections, enterobiasis is more of a nuisance than an actual health threat. It is most frequently identified in children and has been blamed, often erroneously, for a wide assortment of symptoms. The majority of pinworm infestations are asymptomatic. The most common symptom is anal pruritus, which in females may also extend to the vulva. Other symptoms less commonly associated with enterobiasis are abdominal pain, headache, pallor, and cough in children with heavy infestation.1 Erratic migration of the worms may result in choledochal obstruction, pancreatitis, hepatic abscesses, and bronchopneumonia.1 Unusual surgical complications include intestinal obstruction, intestinal perforation, volvulus, intussusception, and appendicitis.1 Migration of the larvae through the lung may produce host sensitization, resulting in pulmonary infiltrates, wheezing, cough, and eosinophilia.1 *Ascaris* infestation is diagnosed by identifying the adult worms or finding the ova in the feces.1

Several drugs are currently available for treatment of *Enterobius* and *Ascaris* infestations. Although gentian violet continues to be marketed "over the counter" for the treatment of pinworms, it represents inferior and outmoded therapy, because safer and more effective agents are available.3 Therefore, its use is not recommended.

Piperazine (Antepar) is effective for the treatment of both ascariasis and enterobiasis. The disadvantages of using piperazine are that it must be given daily for one week, and there is a significant incidence of adverse reactions including vomiting, diarrhea, urticaria, tremor, dizziness, visual disturbances, and weakness.3

Pyrvinium pamoate (Povan Suspension) is extremely effective and may be given as a single dose of 5 mg/kg. It is indicated only for treatment of enterobiasis. Pyrvinium occasionally causes vomiting, abdominal cramping, and diarrhea; it is a red dye that colors the stool and vomitus bright red, so soiling may result in permanent staining of clothing.
Pyrantel pamoate (Antiminth) is extremely effective against both ascariasis and enterobiasis, and may be administered as a single dose of 10 mg/kg. It is not a dye and does not stain. It may cause nausea, vomiting, diarrhea, abdominal cramping, and transient elevation of SGOT level in approximately 2% to 4% of patients.

Mebendazole (Vermox), a relatively recent addition to the anthelmintic armamentarium, is extremely effective against ascariasis and enterobiasis as well as infestations of other nematodes. In clinical trials in children and adults, mebendazole has had a lower incidence of reported adverse side effects than any of the other anthelmintic agents. The only side effects have been abdominal pain and cramping in patients expelling a large worm load. This is not a problem with pinworms. Less than 10% of the drug appears to be absorbed from the gastrointestinal tract (Ortho Pharmaceutical Corp., personal communication, 1977). In four children aged 3 to 6 years who received 100 mg orally as a chewable tablet, plasma levels never exceeded 0.03 μg/ml of mebendazole or 0.09 μg/ml of a metabolite, 2-amino-5(6)-benzimidazolyl phenylketone (Ortho Pharmaceutical Corp., personal communication, 1977). Because of the low systemic bioavailability of this drug, the labeling calls for the same dose for patients of all ages and sizes more than 2 years old. The drug is not recommended for children less than 2 years old because of inadequate data in this group. A single, 100-mg dose is given for the treatment of enterobiasis. The treatment may be repeated in two weeks if necessary. For the treatment of Ascariis infestations, 100 mg is administered twice daily for three days.

Because of their effectiveness, low incidence of side effects, and ease of administration, pyrantel and mebendazole are the drugs of first choice for the treatment of enterobiasis and ascariasis. There is little basis on which to select one over the other.

There have been proposals to make certain of the anthelmintics, specifically pyrantel pamoate, available over the counter for self-treatment of pinworm infestations. The Committee on Drugs disagrees with this position for several reasons.

1. Appropriate treatment requires proper diagnosis, which can only be made by a positive identification of the parasite or its ova. The lay consumer rarely has the equipment or expertise to do this.

2. Many symptoms commonly considered by the public to be associated with roundworm infestation, particularly pinworms, are in fact not caused by parasitosis. This may lead to children receiving a drug unnecessarily and/or self-treatment of a condition with an anthelmintic when the illness or symptom has other causes, and the person should receive appropriate medical attention.

3. Although most of the anthelmintics appear to be relatively safe, there may be a real risk from unsupervised and excessive exposure to these agents following their widespread promotion and over-the-counter sale.

4. The dose of each of the drugs, with the exception of mebendazole, must be based on body weight for safe use. The possibility of dosage errors during over-the-counter use and the inherent danger therefrom are obvious.

The diagnosis and treatment of these infestations should properly be carried out under the care and supervision of a physician, and the appropriate drug should be administered only by prescription.

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