

# AN IMPROVED PIPERAZINE PREPARATION IN THE TREATMENT OF ASCARIASIS

S. R. PLATMAN, M.B., B.Ch., B.A.O.

Stoll<sup>1</sup> stated that in Afrika nearly sixty million people are infected with *Ascaris* and that in some areas it is the cause of more disability than any other helminth.

The roundworm feeds on the partially digested food in the small intestine, although a few worms in well-nourished individuals have apparently little effect on the general condition. In the poorly nourished, however, with a heavy infection, the constant loss of nutrients, particularly protein, can lead to a serious state of malnutrition. Heavy infections can also produce obstruction of the gut which may require surgical intervention. A fatal outcome is not uncommon.

In the absence of adequate sanitation, reinfection is common. From Lwiro, in the Congo, Roels-Broadhurst and Demayer<sup>2</sup> reported that in a group of 192 children, aged 3—12 years and initially cleared of roundworms, reinfection was rapid. After 3 months, 6% were reinfected; after 4 months, 13.6%; after 5 months, 48.4%; and after 6 months, 61.2%. Regular treatment was stated by the authors to be the only practical solution to the problem.

The clinical value of this knowledge has been demonstrated by Biagi and Redriguez.<sup>3</sup> In a village community of 529 persons, *Ascaris* infection was found in 28%. All members of the village were then treated by monthly dosage with piperazine. Regular stool examinations showed a rapid decline in ascariasis and, after 8 months, no cases of the infection could be detected.

## Present Investigation

Among patients admitted to Mbabane Hospital, Mbabane, Swaziland, in a 2-month period for a variety of conditions, 100 cases of ascariasis were diagnosed by the direct smear technique. For the assessment of cure, the Ridley modification of the Formol-ether technique was used. This was found to be rapid and reliable.

A new piperazine product, 'pripsen', a granular form of piperazine phosphate with standardized senna, was selected for treatment because this had given successful results in a few patients with ascariasis who had resisted treatment with a preparation of piperazine citrate.

A further reason for the use of pripsen was the report by White and Scopes<sup>4</sup> who achieved a cure-rate of 97% in the treatment of enterobiasis by the use of a single dose of this preparation, which equals that achieved previously by the usual 7-day twice-daily dosage with piperazine citrate elixir.

Piperazine salts have a paralysing effect on *Ascaris* and *Enterobius* and the worms rapidly recover in a piperazine-free environment.<sup>5</sup> It is important, therefore, that the worms should be rapidly removed from the gut, and standardized senna has been included in the formulation to ensure this. A higher cure-rate can be expected with this preparation than with those containing piperazine alone.

## Materials and Method

Of the 100 patients treated, 82% were under 5 years of age (36 males and 46 females) and 18% were over 5 years of age (4 males and 14 females). Only 44 of these patients were aware that they were infected by *Ascaris*. There were 8 cases of persistent diarrhoea, 3 of obstinate constipation, 4 of

Loeffler's pneumonia, and a number with vague abdominal pains.

Treatment was by a single dose of 5—10 G. of pripsen granules according to age. The full dose of 10 G. contains 4 G. piperazine phosphate.

The pripsen granules were readily accepted and were taken a teaspoonful at a time followed by a drink. The dosages used were: 4 months—3 years, 5 G.; 4—6 years, 7.5 G.; over 6 years, 10 G.

In patients, usually those with heavy infections, where the first dose was not successful, the dose was repeated at 2-weekly intervals in increasing amounts. Thus, 5 G. was increased first to 7.5 G., and then, if necessary, to 10 G. A third dose was required in only 6 patients. 10 G. was the maximum dose used.

## RESULTS

Of the 100 patients treated, 88 were successfully followed up by stool examinations at 7—14 days using the concentration technique. In the remainder, follow-up was not possible, and these have been excluded from the trial. In all patients having symptoms which could be related to ascariasis, i.e. persistent diarrhoea, obstinate constipation, Loeffler's pneumonia, and vague abdominal pains, these disappeared following the passage of worms, except in 1 case of Loeffler's pneumonia which responded eventually to penicillin therapy.

Of the 88 patients completing the trial, 74 (84%) were cured by a single dose and, in the remaining 14, repeated dosage according to the technique described resulted in a 100% cure-rate. Thus, there were no patients who resisted repeated dosage of pripsen. Apart from one patient who was particularly sensitive to senna, there were no undesirable side-effects in this series, which included babies of 4 and 5 months. The largest number of roundworms passed was 61 and, in this case, 3 doses of pripsen were required to produce a negative stool. 78 of the children were found to be under normal height and weight for their respective ages.

## SUMMARY

Pripsen, a new compound of piperazine phosphate and standardized senna, is a highly effective agent against ascariasis.

In the present study, of the 88 patients who completed the trial, 84% were cured by a single dose of pripsen. The remaining 11, mostly heavily infected, responded to repeated dosage in increasing amounts.

Side-effects appeared in only one patient.

Attention is drawn to the necessity of regular dosage at monthly intervals in areas where sanitation is poor if infection with *Ascaris* is to be eliminated.

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## REFERENCES

1. Stoll, N. R. (1947): *J. Parasitol.*, **33**, 1.
2. Roels-Broadhurst, D. and Demayer, E. M. (1958): *Brit. Med. J.*, **1**, 944.
3. Biagi, F.-F., and Rodriguez, O. (1960): *Amer. J. Hyg. Trop. Med.*, **3**, 274.
4. White, R. H. R. and Scopes, J. W. (1960): *Lancet*, **1**, 256.
5. Standen, O. D. (1955): *Ibid.*, **2**, 20.