

## A Single Dose Treatment for Intestinal Amebiasis With Paromomycin

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The ideal drug for the treatment of any parasitic infection is one with low toxicity and high parasitocidal activity when given in a single dose. Numerous workers (1-4) have shown that paromomycin is highly efficacious against *Entamoeba histolytica* and many pathogenic bacteria of the intestinal tract when given in divided doses over a period of several days. Side effects such as nausea, vomiting, abdominal cramps and drug diarrhea have been noted to be few and transitory when present. Absorption of the drug from the intestines is minimal.

Peña-Chavarría, *et al* (5), in a study employing a single dose of paromomycin for intestinal amebiasis at the level of 50 mg/kg. for children and 4 gms. for adults effected a cure rate of 92.1% for adults and 60% for children. Side effects were minimal and transitory. Subsequently Peña-Chavarría (6) treated 30 infected children at the level of 75 mg/kg. with a cure rate of 80%.

The report herein presented is an extension of that study employing the increased dosage level.

### MATERIALS AND METHODS

Stool examinations for the presence of *Entamoeba histolytica* were made by the direct saline and iodine stained smear and the formalin-ether concentration technique. Patients with *E. histolytica* weighing 60 kg. or more were given a single dose of 4 gms. of paromomycin in gelatin capsule form while those under 60 kg received a dosage level of 75 mg/kg. body weight. Children under 40 kg. received the drug in syrup form. Post treatment stool examinations were made on days 7, 14, and 21.

Concomitant *Giardia lamblia* infections were noted and the effect of treatment recorded.

### RESULTS

Thirty-five patients with *E. histolytica* were treated. Of these 33 completed the study. Two complete failures were noted and 2 questionable relapses or reinfections observed. Results are given in Table I. All persons were studied on an out patient basis and the failure of but 2 to return to complete the study, though unexplainable, represents excellent cooperation.

T A B L E 1  
*Results of Treatment of Intestinal Amebiasis with Paromomycin*

(Single Dose) Patients Treated	Post Treatment Stool Examinations		
		Days	
		7	14
29	Neg.	—	Neg.
2	Pos.	Neg.	Pos.
2	Neg.	Pos.	Pos.
1	Neg.	Pos.	—
1	Neg.	—	—

Eight patients in the study were infected with *Giardia lamblia* before treatment. Of these 3 were cured, 2 showed parasites on the 21st day after treatment and 3 were negative on day 7, becoming positive on days 14 and 21.

#### DISCUSSION

The results of this study substantiate the findings of Peña Chavarría, *et al* (5) in that a single dose of paromomycin is effective in the treatment of intestinal amebiasis. A cure rate of 87.8% was obtained. All 11 adults receiving the 4 gm. dose level were cured. The 2 failures reported occurred in children 2 years of age each receiving a total dose of 675 mg. of drug. Both patients in question had acute amebic dysentery.

Considering the possibility that the 2 patients, one receiving 675 mg. the other 1020 mg. of drug, who became positive on the 14th day may have been reinfected rather than relapsed and that the 2 incompleated cases may have remained negative the cure rate would have been over 94%. On the other hand, considering that relapses may have been the explanation for the 2 completed cases cited above it is of interest to note that the total dose received by each patient was quite low when compared with the maximum dose used. Definite failure occurred only at the 675 mg. total dose level. Side effects were minimal and if present, were marked by the general debility, poor health and concomitant infections. Only one patient, an 18 yr. old girl employed at the hospital, vomited approximately 3 hrs. after medication. Notwithstanding, a cure was effected. This patient was highly emotional and subject to suggestion. When told that she had a whipworm infection she immediately developed abdominal cramps in the presence of this investigator.

Because of the general tolerance of this drug and the fact that failures in cure occur at the lower dosage level it seems plausible that the minimum dose could be and should be increased. It is suggested that a maximum tolerated dose be determined for various age groups with the objective in mind of using paromomycin for the mass therapy of intestinal amebiasis at 2 or 3 dose levels.

The paucity of data concerning concomitant *G. lamblia* infections does not warrant a critical evaluation. However, it is apparent that activity against this parasite does occur and further investigation is warranted.

## SUMMARY

Paromomycin in a single dose at the level of 4 gm. for adults weighing 60 kg. and over and 75 mg./kg. for those under 60 kg. effected a cure rate of 87.8% in patients harboring *E. histolytica* in the intestinal tract.

Nineteen patients had acute intestinal amebiasis while the remaining 16 were chronic cyst passers.

All patients receiving the 4 gm. dose were cured.

Failures occurred at the total dose level of 675 mg. per patient.

It is proposed that a maximum tolerated dose for children be determined with the purpose in mind of using paromomycin for the mass therapy of intestinal amebiasis at 2, or the most, 3 single dose levels.

Activity of paromomycin against *Giardia lamblia* was observed.

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## RESUMEN

La Paromomicina en una sola dosis de 4 g. para adultos que pesaban 60 K. o más y de 75 mg/K. para los de menos de 60 K., logró una tasa de curación del 87.8% en pacientes que tenían *E. histolytica* en el tracto intestinal.

Diecinueve pacientes tenían amebiasis intestinal aguda y los otros dieciséis expulsaban quistes en forma crónica.

Todos los pacientes que recibieron la dosis de 4 g. se curaron. Ocurrieron fracasos a una dosis total de 675 mg. por paciente.

Se propone que se determine una dosis máxima tolerada para los niños con el propósito en mente de usar Paromomicina para la terapia en masa de la amebiasis intestinal con 2 o a lo más 3 dosis.

Se observó también actividad de la Paromomicina contra la *Giardia lamblia*.

## REFERENCES

1. CARTER, C. H.  
Paromomycin (Humatin) in the Treatment of Intestinal Amebiasis. *Antib. & Clin. Ther.*, 6:586, 1959.
2. ELÍAS, F. L. AND OLIVER-GONZALES, J.  
Treatment of intestinal amebiasis with paromomycin (Humatin). *Antib. Med. & Clin. Ther.* 6:584, 1959.
3. FISHER, M. W., MANNING, M. C., GAGLIARDI, L. A., GAETZ, M. R. AND ERLANDSON, A. L.  
Paromomycin: Experimental antibacterial activity. *Antib. Ann.* 1959 - 60:293, 1960.
4. PEÑA-CHAVARRÍA, A., MONTERO-GEI, F., LIZANO, C. Y DE LA CRUZ, E.  
Acción terapéutica de la paromomicina (Humatin), sobre *Entamoeba histolytica* y otros protozoarios y bacterias patógenas del intestino. *Rev. Biol. Trop.* 10:19, 1962.
5. PEÑA-CHAVARRÍA, A., HUNTER III., G. W., REDMOND, D. L., LIZANO, C. AND LORÍA, A. R.  
A Single Dose of Paromomycin (Humatin) against Intestinal Amebiasis. *Military Med.* 129(10):947-951, 1964.
6. Personal Communication from Parke, Davis & Co.

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