Use of the Enterotest Duodenal Capsule in the Diagnosis of Giardiasis

A PRELIMINARY STUDY

G. E. THOMAS, J. M. GOLDSMID, A. C. B. WICKS

SUMMARY

The Enterotest was compared with stool examination and jejunal aspirate obtained at jejunal biopsy from the Crosby capsule, as a method for finding *Giardia lamblia*. Twenty-six patients under investigation for malabsorption, as a cause of megaloblastic anaemia, were studied. *Giardia lamblia* was found on 6 occasions in 4 patients. The Enterotest was positive on 5 of 6 occasions, the Crosby capsule on 4 of 7, the first stool on 2 occasions, the second stool twice, and the remaining 2 had 3 negative stools. The Enterotest is a convenient and safe way of looking for *Giardia lamblia* and gave more positives than the Crosby capsule and stool examinations.

S. Afr. Med. J., **48**, 2219 (1974).

It is well recognised that stool examination is an unsatisfactory method of searching for *Giardia lamblia*. The parasite lives primarily in the duodenum and jejunum and is therefore more readily found in duodenojejunal aspirate. The parasite is excreted in intermittent 'showers' and it is therefore likely that an isolated stool specimen could be negative despite a heavy *Giardia lamblia* infestation. The Enterotest is a simple and safe way of sampling duodenojejunal contents. We have compared this method with examination of stools and the aspirate from the Crosby capsule, obtained at jejunal biopsy.

PATIENTS AND METHODS

A total of 26 patients under investigation for malabsorption as a cause of megaloblastic anaemia were studied. In addition to the routine tests for malabsorption each patient had an Enterotest, a jejunal biopsy, and one or more stool examinations.

Enterotest

The Enterotest consists of an opaque, yellow, gelatin pharmaceutical capsule, inside which is packed 140 cm of thread and 3-ply white nylon yarn. The interior of the capsule is lined with silicone rubber and a 1-g spherical lead weight is embedded in the silicone rubber at the base of the capsule. The free end of the thread is looped and protrudes through a hole in one end of the capsule (Fig. 1). The distal end of the line is attached to a paraffin plug in the capsule in such a manner that when the line is withdrawn it separates readily from the capsule. The Enterotest is used as follows: the fasted patient moistens his mouth and throat with water. The capsule is swallowed while the free loop is held. In this way the yarn within the capsule plays out as it goes down. The loop is then attached with adhesive tape to the corner of the mouth. Within 3 - 4 hours 95 - 96% of lines have extended to the duodenum or jejunum. The patient is asked to drink a glass of water after 1 and 2 hours, respectively. In the stomach the gelatin dissolves, leaving a small lead-weighted rubber bag which easily passes through the pylorus. The line is withdrawn with a fairly rapid but gentle pull, leaving the rubber bag to pass unnoticed in the stool. Usually 60 - 90 cm of line are saturated with bile-stained mucus, which is scraped off between two fingers of a gloved hand and immediately examined microscopically for parasites. A pH stick is provided which causes appropriate colour change on application to the line, confirming the oesophageal portion neutral, the stomach

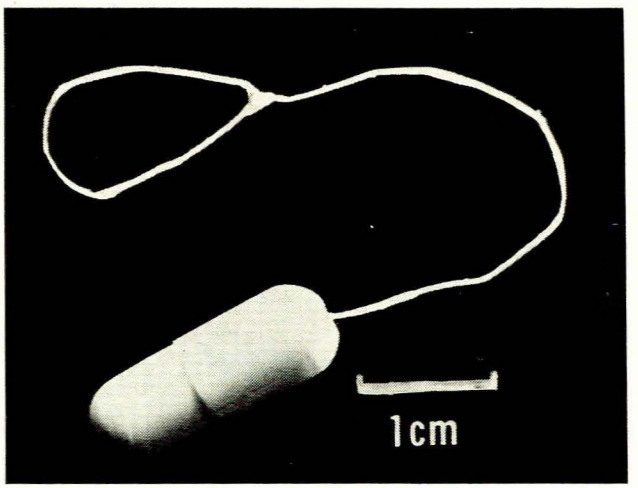

Fig. 1. The Enterotest capsule.

Department of Medicine, University of Rhodesia, Salisbury
G. E. THOMAS, M.R.C.P.
A. C. B. WICKS, M.D., M.R.C.P

Department of Medical Microbiology, University of Rhodesia, Salisbury, Rhodesia
J. M. GOLDSMID, B.SC. (HONS), M.SC., PH.D.

Date received: 22 July 1974.

TABLE I. COMPARATIVE RESULTS BETWEEN METHODS OF INVESTIGATION EMPLOYED

Test	Enterotest	Crosby capsule	Histology	Stool 1	Stool 2	Stool 3
1	+ (trophozoites)	—	—	—	Cysts	—
2	—	+ (trophozoites)	—	—	Cysts	
3	+ (trophozoites)	+ (trophozoites)	—	Cysts		
4	+ (trophozoites)	+ (trophozoites)	—	Cysts		
5	+ (trophozoites)	+ (trophozoites)	—	—	—	—
6	+ (trophozoites)	— X2	—	—	—	—

acid and the duodenum and beyond, alkaline. The success rate in obtaining duodenal contents has been reported as 95 - 96%.[1,2]

Jejunal Biopsy

The conventional Crosby capsule was used, and immediately on withdrawal aspirated jejunal contents were examined microscopically for parasites. The histological sections were carefully examined for intervillous parasites.

Stools

Between 3 and 6 stools were examined until a positive was found, when no further specimen was examined. A fresh stool specimen was examined by direct saline smear, water centrifugation and formol-ether concentration.

RESULTS

Of the 26 patients studied, *Giardia lamblia* was found on 6 occasions in a total of 4 patients. The Enterotest was positive 5 out of 6 times and the Crosby capsule 4 out of 7 times (Fig. 2). No histological sections demonstrated *Giardia*. The first stool was positive on only 2 occasions, the second was positive twice, and in 2 patients 3 consecutive stools were negative. One patient had 3 negative stools, 2 negative Crosby capsules but a positive Enterotest (Table I).

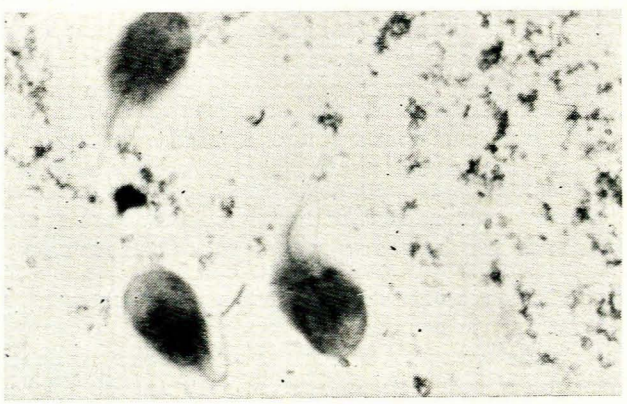

Fig. 2. *Giardia lamblia* **trophozoites.**

DISCUSSION

Stool examination is unsatisfactory for finding evidence of giardiasis, and not every practitioner has facilities for jejunal biopsy. Aspiration of duodenal contents via duodenal intubation is effective for the recovery of *Giardia lamblia* and other small intestinal parasites, but causes far more discomfort to the patient. The Enterotest has been found convenient, painless and eminently suitable for both inpatient and outpatient use. In our series it has proved more useful than stool and biopsy examination. One isolated stool specimen would have revealed *Giardia* in only 2 of our cases. The Enterotest is also useful in the search for other gastro-intestinal parasites such as *Strongyloides stercoralis, Clonorchis sinensis, Fasciola hepatica, Trichostrongylus orientalis, Isospora* species and hookworm.[1-3]

The Enterotest seems to be the best method available for screening patients for upper gastro-intestinal parasites. It has also proved useful for the localisation of upper gastro-intestinal bleeding.[4] The present preliminary study confirmed that the duodenal capsule (Enterotest) is a safe and effective technique for the diagnosis of giardiasis.

We wish to thank Dr C. Beal and the Hedeco Corporation for providing the Enterotest capsules.

REFERENCES

1. Beal, C. B., Viens, P., Grant, R. G. L. and Hughes, J. M. (1970): Amer. J. Trop. Med. Hyg., **19**, 349.
2. Bezjak, B. (1972): Dig. Dis., **17**, 848.
3. Lara-Aguilera, R. (1973): Bol. méd. Hosp. infant. (Méx.), **30**, 288.
4. Babb, R. R. and Beal, C. B. (1973): J. Amer. Med. Assoc., **223**, 924.