
ORIGINAL ARTICLE

Giardiasis in Protein Calorie Malnutrition at Gadjah Mada Hospital, Yogyakarta

by

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Abstract

The study consisted of forty-one patients hospitalized at the Child Health Department of the Gadjah Mada Hospital in Yogyakarta: 24 children were suffering from PCM with a body weight of more than 60% of the Harvard standard and 17 children from PCM with a body weight of less than 60% of the Harvard standard.

The stools of these patients were examined for Giardia lamblia. The result was 16 (39.02%) positive. The Lipidol Absorption Test of the patients with Giardia lamblia revealed:

- 1. 40% from the PCM with a body weight of more than 60% of the Harvard standard were negative.*
- 2. 81.82% from the PCM with a body weight of less than 60% of the Harvard standard were negative.*

The lower the nutritional status the higher the risk for Giardia infection.

Introduction

Protein Calorie Malnutrition (PCM) is one of the 5 major diseases in Indonesian children with a high mortality rate (Djuned S. Pusponegoro, 1968; Poey Seng Hin, 1957). It is known that the etiology of the Protein Calorie Malnutrition is a.o. due to : poor social economic condition, ignorance in the sense of nutrition and chronic infection.

Beside these causes, there is a vicious circle between diarrhea and PCM (Gracey, 1977). Chronic diarrhea or recurrent diarrhea for a long period will result in pathological changes in the mucosa of the gastrointestinal tract (Suharyono et al., 1971) which will further cause a malabsorption syndrome.

Malabsorption syndrome for a long period will finally cause PCM (Suharyono, 1974).

In our cases *Giardia lamblia* infection gave gastrointestinal symptoms, acute diarrhea, chronic diarrhea, fat and carbohydrate malabsorption (Hoskins et al., 1976; Barbieri et al., 1970; Bajoghli and Maleki, 1974). Sometimes *Giardiasis* does not show clinical symptoms (Cortner, 1959; Ament, 1972; Bancroft 1974), so that *Giardiasis* is often not suspected.

The reasons for conducting this study are a.o. to investigate :

1. The correlation of *Giardiasis* and PCM.
2. The percentage of fat malabsorption in *Giardiasis* with PCM.

Material and method

Forty-one patients over 1 year of age with PCM and a body weight of less than 80% of 50 percentile of Harvard standard admitted to the Child Health Department of the Gadjah Mada Hospital in Yogyakarta from 1 April 1976 until 30 September 1976 were included in this trial. These patients were divided into 2 groups, i.e. :

Group I : consisting of patients with PCM and body weight more than 60% of the Harvard standard;

Group II : consisting of patients with PCM and body weight less than 60% of the Harvard standard.

The stools of the patients were examined on 3 consecutive days by the concentrated method of Faust (1964) in the Department of Parasitology, Medical School, Gadjah Mada University.

In the stools of the patients whose *Giardia lamblia* was positive, Lipiodol Absorption Test was done. Lipiodol Absorption Test is a screening method to determine fat malabsorption.

Lipiodol Absorption Test :

Lipiodol consists of poppy-seed oil with the addition of hydriodic acid-oil containing 40% iodine. The amount of iodine in the urine reflexes the percentage of lipiodol absorption which in turn is an indication of the ability to absorb dietary fat, mostly "Long Chain Triglyceride" (LCT). The patients should not be on a restricted fat diet for 2 days prior to and on the day of testing.

The dose of the orally offered lipiodol is 5 ml for patients with a body weight up to 10 kg, 0.5 ml/kg body weight for patients between 10 kg and 20 kg and 10 ml for patients above 20 kg.

Patients without steatorrhoea give a positive reaction (blue colour) due to iodine in up to $1/32$ dilution of the urine. Patients with steatorrhoea give no reaction (no blue colour) in all dilutions or give only a positive reaction (blue colour) in undiluted (1:1) or up to 1:4 dilution of the urine.

The negative Lipiodol Absorption Test means: there is fat malabsorption.

The positive Lipiodol Absorption Test means: there is no malabsorption.

Results

From the 41 cases in this trial 24 were in the first group and 17 cases in the second group (Table 1). From the first group 5 (20.83%) had *Giardia lamblia* positive and 19 (79.17%) *Giardia lamblia* negative in their stools.

The difference in the two groups was statistically significant ($p < 0.05$).

TABLE 1: *Giardia lamblia* examination on the stools in PCM.

Group	B.W	G.L. neg.	G.L. pos.	T o t a l
I	>60%	19	5	24
II	<60%	6	11	17
T o t a l		25	16	41

It means: the more severe the PCM, the more positive *Giardia lamblia* in the stools is. Table 1 shows 16 (39.02%)

stools with positive *Giardia lamblia* out of 41 cases.

TABLE 2: *The Giardia lamblia* examination on the stools of PCM children with and without diarrhea.

Group	B.W.	Without diarrhea		With diarrhea		Total
		G.L. —	G.L. +	G.L. —	G.L. +	
I	>60%	4	—	15	5	24
II	<60%	2	2	4	9	17
T o t a l		8		33		41

In the first group 4 (16.67%) cases were without diarrhea, and from these cases none (0%) had *Giardia lamblia* in their stools. From the 20 (83.33%) with diarrhea 15 (62.50%) of the stools were *Giardia lamblia* negative and 5 (20.83%) were *Giardia lamblia* positive.

In the second group 4 (23.42%) had no diarrhea, while in 2 (11.76%) out of them the stools were *Giardia lamblia*

positive. In the second group 13 (76.48%) had diarrhea, 4 (23.52%) out of them had no *Giardia lamblia* and 9 (52.96%) had *Giardia lamblia* in their stools.

When we observed the cases with positive *Giardia lamblia* in their stools, there were 2 (12.5%) without diarrheal symptoms and 14 (87.5%) with diarrhea.

TABLE 3: *The Lipiodol Absorption Test on the PCM with Giardia lamblia.*

	B.W.	Giardia lamblia (+)		T o t a l
		L.A.T. (+)	L.A.T. (-)	
I	>60%	3	2	5
II	<60%	2	9	11
T o t a l		5	11	16

In the first group 3 (60%) were lipiodol absorption test positive, it means there was no fat malabsorption; and 2 (40%) were lipiodol absorption test negative, it means there was fat malabsorption.

In the second group 2 (18.18%) cases were found with lipiodol absorption test positive and 9 (81.82%) cases with lipiodol absorption test negative. In all of them the stools were *Giardia lamblia* positive. When we observed all the 16 cases with positive *Giardia lamblia* in their stools, there were 11 (68.75%) with lipiodol absorption test negative.

Discussion

In the human body *Giardia lamblia* lives in the distal part of the duodenum and the proximal part of the jejunum (Hoskins et al., 1967; Barbieri et al., 1970; Kamath Murugasu, 1974; Ament, 1972; Barbezat et al., 1967; Belding, 1961). *Giardia lamblia* lives in the intervillous spaces and sticks on the surface of the villi with the sucking disk.

The pathogenesis of the *Giardia lamblia* is not understood clearly. Ament (1972) found that *Giardia lamblia* causes lesions in the mucosa of the jejunum

Bajoghli and Maleki (1974) found *Giardia lamblia* positive in the stools in 10% of 2.983 malnourished diarrheal cases. Barbezat et al. (1967) found 75% *Giardia lamblia* positive in the jejunal juice. These methods except stool examination are very difficult, and it can only be done in hospitals with complete facilities. Based on these facts it seemed that if in this study other methods of *Giardia lamblia* examination had been done, there would have been more positive cases.

Another suggestion is that if there is *Giardia lamblia* in the stools, metronidazol with a dose of 40 mg/kg BW/day should be given as the drug of choice, or atebriane 8 mg/kg BW/day for 10 days.

At least to decrease the incidence of *Giardiasis* better sanitation and hygiene are suggested.

Summary

1. *Giardia lamblia* was positive in 39.02% of the stools of PCM cases.
2. a. Lipiodol Absorption Test negative (fat malabsorption) was found in 40% of malnourished (PCM) cases with a body weight of more than 60% of the Harvard standard with *Giardiasis*.
- b. Lipiodol Absorption Test negative (fat malabsorption) was found in 81.82% of malnourished cases with a body weight of less than 60% of the Harvard standard with *Giardiasis*.

Conclusion

The lower the nutritional status the higher the risk for *Giardia lamblia* infection.

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