

ETHICAL REVIEW COMMITTEE, ICDDR,B.

Principal Investigator Andrew Hall Trainee Investigator (if any) _____
 Application No. 86-021 Supporting Agency (if Non-ICDDR,B) _____
 Title of Study Giardia and persistent Project status:
diarrhoea in rural Bangladeshi children: (x) New Study
a study of food intake, gut permeability () Continuation with change
and growth () No change (do not fill out rest of form)

Give the appropriate answer to each of the following (If Not Applicable write NA).

1. Source of Population:
 (a) Ill subjects Yes No
 (b) Non-ill subjects Yes No
 (c) Minors or persons under guardianship Yes No

2. Does the study involve:
 (a) Physical risks to the subjects Yes No
 (b) Social Risks Yes No
 (c) Psychological risks to subjects Yes No
 (d) Discomfort to subjects Yes No
 (e) Invasion of privacy Yes No
 (f) Disclosure of information damaging to subject or others Yes No

3. Does the study involve:
 (a) Use of records, (hospital, medical, death, birth or other) Yes No
 (b) Use of fetal tissue or abortus Yes No
 (c) Use of organs or body fluids Yes No

4. Are subjects clearly informed about:
 (a) Nature and purposes of study Yes No
 (b) Procedures to be followed including alternatives used Yes No
 (c) Physical risks Yes No
 (d) Sensitive questions Yes No
 (e) Benefits to be derived Yes No
 (f) Right to refuse to participate or to withdraw from study Yes No
 (g) Confidential handling of data Yes No
 (h) Compensation &/or treatment where there are risks or privacy is involved in any particular procedure Yes No

5. Will signed consent form be required:
 (a) From subjects Yes No
 (b) From parent or guardian (if subjects are minors) Yes No

6. Will precautions be taken to protect anonymity of subjects Yes No

7. Check documents being submitted herewith to Committee:
 _____ Umbrella proposal - Initially submit an overview (all other requirements will be submitted with individual studies).
 Protocol (Required)
 Abstract Summary (Required)
 Statement given or read to subjects on nature of study, risks, types of questions to be asked, and right to refuse to participate or withdraw (Required)
 Informed consent form for subjects
 Informed consent form for parent or guardian
 Procedure for maintaining confidentiality
 Questionnaire or interview schedule

* If the final instrument is not completed prior to review, the following information should be included in the abstract summary:
 1. A description of the areas to be covered in the questionnaire or interview which could be considered either sensitive or which would constitute an invasion of privacy.
 2. Examples of the type of specific questions to be asked in the sensitive areas.
 3. An indication as to when the questionnaire will be presented to the Cttee. for review.

(PTO)

We agree to obtain approval of the Ethical Review Committee for any changes involving the rights and welfare of subjects before making such change.

Principal Investigator Andrew Hall Trainee _____

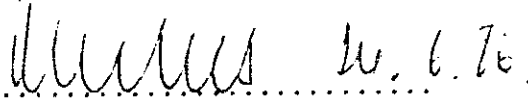
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1986

86-021
1987

SECTION 1 - RESEARCH PROPOSAL

- 1. TITLE : Giardia and persistent diarrhoea in rural Bangladeshi children: a study of food intake, gut permeability and growth.
- 2. PRINCIPAL INVESTIGATOR : Andrew Hall
- CO-INVESTIGATORS : Asma Islam, Andrew Tomkins
- 3. STARTING DATE : January 1st 1987
- 4. COMPLETION DATE : December 31st 1988
- 5. TOTAL COST : £ 59 710
- 6. ACTING SCIENTIFIC PROGRAMME HEAD : Dr. Roger Eeckels

This proposal has been approved by the Nutrition Working Group.

SIGNATURE OF ACTING SCIENTIFIC PROGRAMME HEAD : 

DATE :

7. ABSTRACT.

The study involves an investigation of the relationship between persistent diarrhoea, food intake, intestinal permeability and the growth of rural Bangladeshi children infected with Giardia, and on the effect of treating infections.

After enrollment, a weekly health diary will be recorded. The growth and nutritional status of children will be assessed by monthly anthropometry; a faecal sample will also be collected each month for microscopical examination for intestinal parasites. At the onset of diarrhoea a faecal sample will be collected for microscopical examination and rectal swabs will be taken for microbiological culture and for a rotavirus ELISA.

Persistent diarrhoea due to Giardia will be treated with 3 consecutive daily doses of metronidazole. Nutrient intakes will be estimated in a number of children with persistent diarrhoea due to Giardia and intestinal permeability will be assessed in two ways: by measuring alpha-1-antitrypsin in the faeces and by measuring the excretion in the urine of lactulose and mannitol after an oral dose.

8. REVIEWS:

1. Ethical Review Committee.

2. Research Review Committee.

3. Director.

SECTION II -- RESEARCH PLAN

A. INTRODUCTION.

In recent years the role of enteropathogens in the development of acute diarrhoea has received considerably more attention than has the cause of persistent* (or protracted) diarrhoea, defined here as diarrhoea which lasts for more than 14 days during which there are no more than 4 days without diarrhoea. Some of the probable causes of persistent diarrhoea are an abnormal bacterial colonisation of the upper small intestine, persistent infections with bacteria such as Shigella, food intolerance, and parasitic infections such as Entamoeba histolytica and Giardia. The research proposed here is particularly concerned with Giardia and its role in persistent diarrhoea and growth faltering.

A first infection with Giardia usually results in disease and unless treated may lead to persistent diarrhoea: in Bangladesh the first infection may occur as young as 3 months of age (Islam et al, 1983). A primary infection is usually associated with abdominal discomfort, nausea, loss of appetite and malabsorption, all of which can have an impact on nutritional status (Gupta, 1980; Tomkins 1981; Solomons, 1982). Some resistance to the infection usually develops in an immunocompetent host after about 3 months, and this immune response may lead to an asymptomatic infection or may result in the expulsion of the organism (Erlandson & Meyer, 1985).

The microscopical examination of a direct smear of faeces is a fairly unreliable and insensitive means of diagnosing Giardia for two reasons: cysts are often excreted intermittently and in variable numbers, and because so little faeces -- less than 5 mg -- is actually scrutinised. Several techniques involving flotation or sedimentation are commonly used to concentrate cysts from up to 1 g of faeces, thereby increasing the sensitivity of diagnosis; the skill and experience of the microscopist is also crucial in detecting Giardia. Although the microscopical examination of faeces may miss some infections, the diagnosis made is highly specific -- there are unlikely to be any false positives.

The recently published descriptions of two enzyme-linked immunosorbent assays (ELISA's) to detect Giardia in stools should theoretically speed up the ability to screen large numbers of faecal samples and could also provide a more sensitive first-line diagnostic test (Ungar et al, 1984; Green et al, 1985). An ELISA may also be able to detect very small amounts of Giardia antigen in a form invisible under the microscope. But for complex biological reasons the ELISA's reported in the literature to detect Giardia antigen in the faeces are difficult to reproduce. Andrew Hall has raised antiserum to Giardia in goats, rabbits, rats and guinea-pigs using trophozoites he has isolated and grown axenically in vitro. These antibodies have shown a considerable amount of non-specific reaction in trial double antibody sandwich assays using faecal samples containing Giardia. In February 1986 the highest titre antisera were purified by affinity chromatography (see Green et al, 1985).

* The term "persistent" diarrhoea is that used by the WHO Diarrhoeal Diseases Control Programme in document "Persistent diarrhoea in children - research priorities."

but considerable cross-reaction was again encountered when the immunoglobulins obtained by this process were tested against stools containing Giardia. The work is continuing but the prospects are not good.

Whatever the result of an ELISA, a diagnosis of Giardia would still need to be confirmed by microscopy. Because of the uncertainty over the ELISA the microscopical examination of faeces after concentrating eggs and cysts by sedimentation in ether will be the main diagnostic tool in these studies. A laboratory technician will be employed to work full time at this task.

There has been little prospective research in Bangladesh on persistent diarrhoea either with or without Giardia. A one year study of 157 Bangladeshi children showed that 25% had persistent diarrhoea (>21 days duration) at least once, though a pathogen was identified in only 50% of cases; Giardia was looked for (by a simple direct smear) only when no bacterial pathogen was found (Black et al, 1984). In a prospective study of giardiasis in Bangladesh, 33 mothers with infants less than 4 months of age were studied (Islam et al, 1983). During the next year, 42% of infants and 82% of mothers were infected with Giardia. Thus it is likely that Giardia is an important and often undiagnosed cause of persistent diarrhoea among infants and children in Bangladesh.

The precise cause of the diarrhoea in Giardia infections is not certain. There is some evidence that the malabsorption of fat which can occur is due to the deconjugation of bile salts brought about by bacteria which abnormally colonise the upper small intestine during the infection (Tomkins et al, 1978). Experiments in mice have indicated that concentrations of cyclic AMP in the intestine are raised during Giardia infections, but the controls used in these experiments were unsatisfactorily described (Ganguly et al, 1984). In addition, the diarrhoea of giardiasis is not typically secretory in nature though watery diarrhoea can occur. A protein-losing enteropathy has been described (Sherman, 1980) but little is known about intestinal absorption or leakage during giardiasis. Damage to the gut mucosa of variable severity and patchy distribution has been shown to occur during infections with Giardia (Wright, Tomkins & Ridley, 1977). However a major problem in assessing altered intestinal permeability resulting from gut damage has been the lack of non-invasive or harmless tests. In recent years several studies have shown the use of measuring the ratio of the concentration of two non-metabolised solutes in the urine after an oral dose: the ratio of mannitol (fairly well absorbed by a healthy gut) to lactulose (poorly absorbed by a healthy gut) provides a sensitive and reproducible indicator of intestinal permeability (Lancet, 1985; Behrens et al, 1986). Another indicator of impaired intestinal permeability is the concentration in the faeces of alpha-1-antitrypsin: it has been shown to be a useful indicator of intestinal protein loss, particularly in children (Hill et al, 1981).

A 30% reduction in food intake has been demonstrated among Gambian children with persistent diarrhoea of a variety of causes, including Giardia (Tomkins, 1983). However there is little information on the effect on food intake of any specific pathogen causing persistent diarrhoea. In addition to any loss of appetite the position may be further complicated by a change in the quality and quantity of food offered by parents to their children with diarrhoea.

B. AIMS.

1. To determine how frequently Giardia is associated with diarrhoea, and in particular with protracted diarrhoea, among infants and children in rural Bangladesh.
2. To examine the impact of infections with Giardia on the food intake, intestinal permeability and growth of a cohort of young children.
3. To examine the impact on food intake, intestinal permeability and growth of treating Giardia with metronidazole.

C. METHODS.

The study consists of an intensive 2 year investigation of the impact of persistent diarrhoea due to Giardia on the food intake, intestinal permeability, nutritional status and growth of about 200 young children near Mirzapur in rural Bangladesh. The villages from which children will be recruited will not be those currently part of the Mirzapur Handpump Project and will be selected after discussions with any aid agencies working locally.

Preliminary studies undertaken by the Mirzapur Handpump Project in one village in the area indicate a high population density of over 1000/km² with over 13% less than 5 years of age and a high incidence of diarrhoea: in March 1984 in one village 43% of children aged less than 5 had at least one episode of diarrhoea or dysentery.

Recruitment and enrollment. A cohort of about 100 infants aged from 6 to 18 months will be recruited at the start of the study. In addition during the first year, up to 100 more infants will be recruited as they reach the age of 6 months (see Consent Form 1).

At enrollment all children will be examined by the project physician for current ailments and signs of malnutrition. Treatment will be given according to their medical needs and children with any serious medical problems will be referred to Kumudini hospital. Each child will be weighed, then supine length and mid-arm circumference will be measured. A fresh faecal sample will be collected from each child and examined for the trophozoites of protozoa under a microscope in the field office; another sample will be fixed in PVA/Schaudinn's fluid for later examination after concentrating any parasite eggs and cysts using an ether sedimentation technique (Hall, 1980). Treatment will be provided for intestinal helminth infections using levamisole (Ketrax; ICI) and mebendazole (Vermox; Pfizer). If the child has not already been vaccinated and if the mother wishes it, each child in the study will be vaccinated against diphtheria, pertussis, tuberculosis, tetanus, measles and polio.

Risk factors for Giardia infections. When an infant is enrolled in the study, and if the mother wishes, a faecal sample will be collected from her and her other children less than 10 years of age and will be examined for the eggs and cysts of intestinal parasites. Treatment for intestinal helminths will be provided.

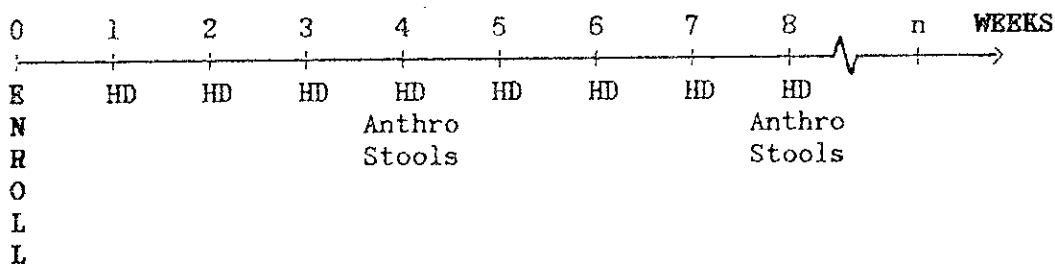
Information relating to water sources, latrines and socio-economic status will be obtained from the mother by questionnaire (see Appendix A). The questionnaire will be repeated one year after enrollment to assess any changes in circumstances.

Routine surveillance. Fieldworkers will visit each mother once a week to record ill-health in her child, both currently and retrospectively. The health diary will record respiratory tract infections, fever, skin complaints, diarrhoea etc. Several village women will be recruited as paid reporters to tell fieldworkers of any episodes of diarrhoea between weekly visits. In this way diarrhoea will be recorded as soon as possible after its onset and action to diagnose the cause can be taken quickly (see **Diarrhoea**).

A fresh faecal sample will be collected once a month for microscopical examination for parasites. If intestinal helminths are diagnosed appropriate treatment will be given. Nutritional status and growth will be assessed each month by anthropometry. The routine examinations to be performed are shown in Figure 1.

FIGURE 1

Showing the routine information to be collected about each child either weekly or monthly after enrollment.



(HD = health diary; Anthro = anthropometry;
Stools = stool microscopy)

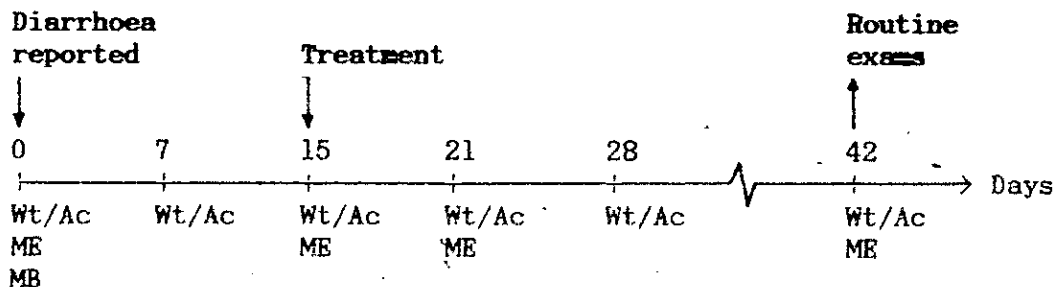
Diarrhoea. Diarrhoea will be recorded if the mother reports it, though questions will be asked about the number and form of bowel movements. If the report is confirmed to be diarrhoea (more than three liquid stools a day), a sample of faeces will be collected as soon as possible after the onset for parasitological examination (direct smear and concentration technique). Rectal swabs will be taken and placed in both Cary-Blair and buffered glycerol saline transport media to be cultured by the Microbiology Branch of the ICDDR,B for Vibrio cholerae, Salmonella spp, Shigella spp, enterotoxigenic Escherichia coli and Campylobacter spp. Another faecal sample will be placed in phosphate buffered saline to be tested for rotavirus by an ELISA.

Dr. Tomkins will visit the study in the opening months and will discuss the management of diarrhoea with Dr. Asma Khanam, the project physician and the health assistants. The mothers of children with diarrhoea will be provided with packets of oral rehydration salts for them to make up when needed. Children with diarrhoea will be visited by the project physician and drugs will be given if considered necessary on clinical criteria.

The body weight and arm circumference of children with diarrhoea will be measured each week (Figure 2). If a child still has diarrhoea 14 days after the onset, then another faecal sample will be collected for parasitological examination and a rectal swab will be placed in transport medium for microbiological culture as before. Appropriate treatment will be begun depending on the results of the first microbiological culture and the clinical judgement of the physician.

FIGURE 2

The course of events for children who develop diarrhoea due to Giardia.



(Wt = body weight; Ac = Arm circumference; ME = microscopical examination; MB = microbiological culture).

Treatment for Giardia. If Giardia is identified and when the results of all the microbiological cultures are ready, 15 days after the onset of diarrhoea each child will be treated daily for 3 days with a single dose of metronidazole syrup (50 mg/kg body weight; see Speelman, 1985). A faecal sample will be collected 7 days after treatment and metronidazole will be given again if found to have been ineffective. A month after successful treatment children will be returned to the routine schedule of examinations.

Children with persistent diarrhoea not caused by Giardia will be treated according to the results of the microbiological tests and on clinical criteria.

Food intake of children infected with Giardia. Two fieldworkers working in shifts will carry out weighed food intake measurements on a number of fully weaned children with persistent diarrhoea due to Giardia, beginning at dawn and ending when the child goes to bed. The fieldworkers will measure the intake of food for 3 days prior to treatment with metronidazole (during the infection) and for 3 days afterwards (during the recovery period). Food intake will be measured again for 3 days about 2 to 3 weeks after treatment when the child has recovered, to estimate normal food intake (see Consent Form 2).

In addition to using food tables, the nutrient content of samples of food consumed by children will be collected in order to estimate their energy and nitrogen content in the Biochemistry Branch of the ICDDR,B. This study should provide information on the food intake of about 20 children infected with Giardia.

Intestinal permeability. During the measurements of food intake, children with persistent diarrhoea due to Giardia will be given a drink containing 5 g lactulose and 1 g of mannitol according to the methods of Behrens et al (1985). Neither of these sugars provide energy and the drink will be artificially flavoured and sweetened. All urine will be collected for the next 5 hours and a 5 ml sample will be taken and frozen for subsequent analysis at the London School of Hygiene and Tropical Medicine using enzymatic methods (see Behrens et al, 1985). Intestinal permeability will be assessed again 2 to 3 weeks after treatment with metronidazole, during the further measurements of food intake.

A faecal sample will be collected from the same children at the time of the lactulose/mannitol test. It will be freeze-dried and the alpha-1-antitrypsin will be extracted and frozen for later analysis using a quantitative immunological technique (either by light scatter in a Multistat III Centrifugal analyser if one is purchased by the Dept. of Human Nutrition of the LSH&TM, or by rocket immunoelectrophoresis at ICDDR,B).

Intestinal permeability will be assessed by the lactulose/mannitol and alpha-1-antitrypsin assays in a number of healthy children taking part in the general study in order to estimate normal values for comparison with those from children with diarrhoea (see Consent Form 3).

Analysis of results. The monthly anthropometric measurements of children will be used to establish curves for the growth of this group of rural Bangladeshi children. Unlike the reference standards based on North American children, growth curves produced in this way will reflect seasonal changes in growth and may help to control for age-related differences in patterns of growth (see Black et al, 1984).

This prospective study will generate information about the effect of both acute and persistent diarrhoea on the growth and nutritional status of rural Bangladeshi children. Particular attention will be paid to persistent diarrhoea due to Giardia. The anthropometric measurements of children with persistent diarrhoea will be compared with matched controls without diarrhoea during the same period in a case control analysis.

The estimates of food intake will be compared before treatment with metronidazole and after recovery. The estimates of intestinal permeability will be analysed by comparison with uninfected, otherwise healthy controls.

All results will be recorded on coded forms and analysed using an Olivetti M24 computer with an appropriate database such as DataBase III or DataStar, and a statistical package such as SPSS-PC, SAS or Statgraphics.

D. SIGNIFICANCE.

This study will provide the following information about a cohort of young children in rural Bangladesh.

- a. The incidence, duration and possible causes of persistent diarrhoea.
- b. The proportion of children in whom acute diarrhoea develops into persistent diarrhoea.
- c. The incidence of Giardia as a cause of persistent diarrhoea.
- d. The effect of Giardia on food intake and on the impact of treatment with metronidazole.
- e. The effect of Giardia on gut permeability and the impact of treatment with metronidazole.
- f. The effect of general illnesses, acute diarrhoea, persistent diarrhoea and Giardia on growth and nutritional status.
- g. The prevalence of intestinal parasitic infections in young children and the rate at which they become infected or reinfected.

E. FACILITIES AND SERVICES REQUIRED.

1. Laboratory space in the Biochemistry branch at the ICDDR,B.
2. Office space at the ICDDR,B.
3. Microbiological culture of faecal samples and ELISA for rotavirus.
4. Purchase of some reagents and glassware from the ICDDR,B.

F. COLLABORATION.

Dr. Asma Islam is expected to devote up to a quarter of her time to this research, so 25% of her salary will be paid. A physician and five fieldworkers will be recruited to work full-time in Mirzapur for 2 years. A laboratory technician will be recruited to work in Dhaka.

Dr. Hall's salary and airfares are paid by a 3 year grant to the London School of Hygiene and Tropical Medicine (LSH&TM) from the Overseas Development Administration.

An application for financial support for this research has been submitted in the name of Dr. Andrew Tomkins to the Medical Research Council (U.K.). If successful the award will be administered by the London School of Hygiene and Tropical Medicine and by Dr. Hall in Dhaka. Dr. Tomkins' salary is paid by the LSH&TM; only his airfares will be paid for by this grant.

G. REFERENCES

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ABSTRACT SUMMARY (?)

The study aims to establish the role of Giardia in persistent diarrhoea and growth faltering in a cohort of children in rural Bangladesh. The effects of Giardia on food intake, intestinal permeability, growth and nutritional status will be assessed by weighing food consumed in the home, a biochemical test of gut permeability, an immunological test of intestinal protein loss, sequential faecal examinations and by nutritional anthropometry. The impact of treating infections will also be assessed.

Children less than 3 years of age are particularly vulnerable and susceptible to diarrhoeal diseases in general and it is on them that the most significant effects are likely to occur.

Informed consent will be obtained from the mother of each child and all children will be given a code number by which to identify them to ensure confidentiality.

An interview about 30 minutes long will take place in the house of the mother of any child to collect information about risk factors for childhood diarrhoea.

The immediate benefits to the child will be as follows: a medical examination by a physician and referral if necessary; regular home visits by health assistants and access to the project physician if needed; diagnosis of causes of diarrhoea with treatment if clinically necessary; provision of oral rehydration salts for diarrhoea; treatment for Giardia infections; treatment for intestinal helminths; and vaccination for diphtheria, pertussis, tetanus, tuberculosis, polio and measles if requested.

The mother and her other children less than 10 years old will receive treatment for their intestinal helminth infections.

The only samples required from children in the study are of faeces and urine, and from the mother, faeces and small amounts of food for nutritional analysis.

SECTION 3 - PERSONNEL

Name	Position	Percentage time	
		Yr 1	Yr 2
Andrew Hall	Principal investigator	100%	75%
Asma Islam	Co-investigator	25%	25%
Andrew Tomkins	Co-investigator	10%	5%
?	Physician	100%	100%
?	Health assistant	100%	100%
?	Health assistant	100%	100%
?	Health assistant	100%	100%
?	Health assistant	100%	100%
?	Health assistant	100%	100%
?	Laboratory tech'n.	100%	100%
4?	Reporters	Part	time

DETAILED BUDGET

1. Personnel

Project requirement

Name	Position	Pounds	Taka
Asma Islam	Co-investigator	3495	153780
?	Physician	4220	185680
?	Health assistant	2135	93940
?	Health assistant	2135	93940
?	Health assistant	2135	93940
?	Health assistant	2135	93940
?	Health assistant	2135	93940
?	Lab. technician	3535	155540
4	Reporters	1250	55000
Sub-total		23175	1019700

2. Materials

Sample bottles, containers etc	2500	110000
Diagnostic reagents	2000	88000
Drugs, syringes, needles	1500	66000
Sub-total		6000 264000

3. Equipment

7885 346940

4. Patient hospitalisation

nil

5. Out-patient care

nil

6. Local transport

2000 88000

7. International travel

1300 57200

8. Shipping

1300 57200

9. Rent

2000 88000

10. Printing

2750 121000

11. Miscellaneous

13300 585200

Sub-total 30535 1343540

TOTAL 59710 2627240

(1 Pound sterling is about Taka 44 - 10/6/86)

CONSENT FORM 1

General

Giardia and persistent diarrhoea in rural Bangladeshi children:
a study of food intake, gut permeability and growth.

(Statement to be read to the mother when consent is obtained)

Mother's name:

Child's name:

Child's ID No.:

Diarrhoea is a very common illness during childhood. We are from the International Centre for Diarrhoeal Disease Research, Bangladesh and we are studying the effect of diarrhoea on the health and growth of young children in this area. The work we want to do will help to tell us more about the causes and effects of diarrhoeal diseases among children living in rural Bangladesh. If you give your permission, during the next two years we would like to follow the health and growth of your youngest child, _____ (insert child's name). You and your child will be under the care of our doctor and health assistants during this time and will be given free treatment for any illnesses. This is what will happen today and over the next two years or so.

Firstly today, the doctor will give your child a thorough physical examination to check that he/she is well. If we find anything wrong we will provide an appropriate treatment. Next we would like to weigh your child and measure his/her length and arm circumference. Then we would like to collect a faecal sample in order to test it in the laboratory for evidence of worms in the intestine: if we find any we will provide treatment. Finally today we would like to ask you some questions about your household and yourself.

Then once a week for the next two years or so, one of our Health Assistants will visit you to ask about the health of your child during the previous 7 days. Please tell the Health Assistant what complaints he/she has had and what treatment you gave him/her, if any. If your child is seriously ill at any time please bring him/her to one of our treatment centres. We will make arrangements for him/her to be seen in hospital if that is necessary.

Children of your child's age pick up the eggs of worms very easily when they play in the dirt and then put their fingers in their mouths. For this reason we would like to collect a faecal sample from her/him each month to test it for worms such as the large roundworm and the whipworm. Also once a month we would like to weigh and measure your child to see how he/she is growing.

There are a number of common diseases which can be particularly serious for young children: diphtheria, pertussis, tetanus, tuberculosis, measles and polio. If you would like us to we are willing to vaccinate your child to protect it from these diseases when it is old enough, but please let us know if someone else has already given any vaccinations before.

If your child gets diarrhoea please begin immediately to give oral rehydration solution and then tell your local reporter who will contact us as soon as possible. Someone will come to your house to see the child and to take some faecal samples to test for causes of diarrhoea which may need treatment. However, most types of diarrhoea will get better on their own in 7 to 10 days and do not need treatment with medicines.

If your child gets diarrhoea please give him/her as much ORS to drink as he/she wants. The Health Assistant will weigh and measure your child once a week while he/she is ill. If the diarrhoea goes on for longer than normal the doctor will visit your child again and we will do some more tests to try and find out why this has happened.

If you would like us to we are also willing to test a faecal sample from you and your other children for intestinal worms. We will provide treatment for any worms which we detect though the results of the tests may not be available for some time.

There will be no charges for any of the treatment we provide for you and your child or for the worm medicines for your other children. You are free to withdraw from this study at any time. All of the information we collect will be kept confidential.

If you agree to let your child take part please will you sign this form or put your mark or fingerprint below.

Mother's signature or
fingerprint:

Doctor's signature for
Principal Investigator:

Date:

Food intake and intestinal permeability

Giardia and persistent diarrhoea in rural Bangladeshi children: a study of food intake, gut permeability and growth.

(Statement to be read to the mother when consent is obtained)

Mother's name:

Child's name:

Child's ID No.:

Your child is taking part in our study of the effect of diarrhoea on the health and growth of young children. We have discovered that the diarrhoea she/he has at the moment (which may come and go) is due to an organism living in the intestines called Giardia. As soon as we get the results of all the tests we are doing to make sure there are no complications, we will treat your child with three doses of medicine.

We know that the growth of children is affected by how much they eat, and that when they are ill their appetite tends to fall. We think that Giardia has the same effect on the appetite and we would like to measure how much food your child eats for a total of 9 days over the next 5 weeks as follows: for 3 days before we give the medicine, for 3 days after all the medicine has been taken, and then for 3 more days three weeks later.

In order to measure how much food your child eats each day the health assistant will weigh all dry food and water before you add it to the cooking pots. She will then weigh the cooked food which you give to your child and weigh whatever food is left over. The difference will tell us how much your child has eaten. The health assistants will try not to disturb you too much while they do this. They may also ask to take some very small samples of the cooked food, less than one ounce, in order to measure its energy and protein content.

To do this work two health assistants will come to your house, one at dawn for 6-7 hours and one to take over for the next 6-7 hours until your child goes to bed. If your child consumes any food or drink other than water while the Health Assistants are not in your house please let them know what it was and how much he/she ate or drank.

While we are measuring how much food your child is consuming we would also like to test that his/her intestine is absorbing food properly. We want to do this because we think that Giardia may affect the way that food is absorbed into the body and that it may cause a loss of protein into the gut as well. We can measure these processes quite simply and harmlessly in two tests.

In the first test we will give your child a sweet drink. The sugars in this drink are absorbed into the gut and then pass out of the body in the urine. For the next 5 hours after giving the drink we want to collect all

his/her urine into a bag which we can stick onto his/her body.

For the second test all we require is a faecal sample.

We will repeat these tests on each occasion that we measure how much food your child is eating.

If you agree to what we want to do please will you sign this form or mark it with your finger print. You are free to withdraw at any time from this part of our work but still remain in the general investigation.

Mother's signature or
finger print:

Doctor's signature for
Principal Investigator:

Date:

CONSENT FORM 3

Intestinal permeability of healthy Bangladeshi children.

Giardia and persistent diarrhoea in rural Bangladeshi children:
a study of food intake, gut permeability and growth.

(Statement to be read to the mother when consent is obtained)

Mother's name:

Child's name:

Child's ID No.:

Your child is taking part in our study of the effect of diarrhoea on the health and growth of young children. When children have diarrhoea their intestines may be damaged temporarily by the organism which causes the illness and so the absorption of food may be affected. We can measure how well the intestine is absorbing food by doing two simple tests, and we are doing them on a number of children who have diarrhoea caused by Giardia. We would like to do the same tests on some healthy children such as your child, if you give your permission. This will tell us what the absorption of food should be like in normal children when they are healthy. The tests are perfectly harmless and are easy to do.

In the first test we will give your child a sweet drink which contains two sugars which are absorbed from the gut and passed out with the urine. We will need to collect all the urine your child produces for the next 5 hours after giving the drink. To do this we can stick a bag onto your child into which all the urine will be collected. The amount of the two substances in the urine will tell us how well they were absorbed from the intestine.

For the second test all we require is a faecal sample.

If you give your permission for us to go ahead please will you sign this form or mark it with your finger print.

Mother's signature or
finger print:

Doctor's signature for
Principal Investigator:

Date:

Giardia and persistent diarrhoea in rural Bangladeshi children:
a study of food intake, gut permeability and growth.

QUESTIONS TO BE ASKED OF THE MOTHER OF EACH CHILD IN THE STUDY

How many people slept in the house last night?
How many were visitors?
How many people were away from home last night?
How many children live in the household?
Who is the head of the household?

Who owns the house you live in?
If owned by someone not living in household what is the rent/month?
How long have you lived in this house?
How many rooms does the house have?
What are the walls made of?
What is the roof made of?
What is the floor made of?
What are the outside dimensions of the house?
Does the house have electricity?
What fuel do you use to cook?

Where do you and your family usually defaecate?
If a latrine is used, what type is it?

Does your house or compound have its own water source?
Where do you obtain water from for the following purposes:
drinking, cooking, washing clothes, bathing?

How much land do you and your husband own?
How much land do you and your husband rent?
What is the annual rent for the land?
How much land do you and your husband sharecrop?
How much of the crop do you give to the owner of the land?
Is any more land owned or rented or sharecropped by other members of the household?

What food crops do you grow?
What cash crops do you grow?
What animals do you own and how many of each?
Do you or your husband own a transistor radio, boat, bicycle?

What is your husband's name?
How old is he?
Does your husband have a job?
Where does he work?
If husband is away - how often does he come home?
- does he send money home?
- how much money does he send home each month?

Do you have a paid job of any kind?

If yes: - is it full time/part time?

- how many days/week?

- how many hours/day?

- how much are you paid/month?

- who looks after the child while you are
at work?

How many other people with employment are there in the household?

How many brothers and sisters do you have?

How many of your brothers and sisters are older than you?

How many years have you been married?

How many children do you have?

Please tell us the name, age and gender of each child.

How long after you were married did you have your first child?

How many pregnancies have you had?

Have any of your children died?

If yes, do you know what they died of?

Are you pregnant at the moment?

If yes, for how many months?

Did you go to school?

If yes: - for how many years?

- what sort of school did you go to?

Can you read?

What is your religion?

Finally, what is your full name?

How old are you now?

ସମ୍ମତି ପତ୍ର - ୧

ସାର୍ବଭୂମି

ବା.ଲା.ନା.ଦେ.ସେ.ର ଗ୍ରାମାଞ୍ଚଳ ସିନ୍ଧୁଦେବ କ୍ରମାଗତ ଜାୟଠିଆ ଓ ଜିୟାପଠିଆ :
ଧାନ୍ୟସୂତ, ନାଡ଼ିଠି ଅତିଥ୍ୟାଦି ସର୍ବ ସ୍ଵୀକୃତ ପୂର୍ବ ଶେଷେଣା
(ସମ୍ମତି ସୂତର ସମସ୍ତ ସିନ୍ଧୁ ମାତ୍ରେ ଚିହ୍ନାଦିତ ବିଷୟ ଏହି ଫୋରମ୍ ଉପରେ)

ମାତ୍ର ନାମ -----

ସିନ୍ଧୁ ନାମ -----

ସିନ୍ଧୁ ଅପରିଚିତ ନାମ -----

ସିନ୍ଧୁଦେବ ଜାୟଠିଆ ପ୍ରାୟଶ୍ଚେଦ ଯାଏ । ଆମର ଆନ୍ତଃଜାତିକ କର୍ତ୍ତବ୍ୟ ଶେଷେଣା ଶେଷେଣା ଶେଷେଣା
ସିନ୍ଧୁଦେବ ଦ୍ଵାରା ଓ ପୂର୍ବେ କେବଳ ଜାୟଠିଆ ପ୍ରଭୃତି ତାହାର ଜନ୍ମ ଓ ବିଷୟ ଶେଷେଣା ଗଣିତେ ଯାଏ ।
ଏହି କେବଳ ଧର୍ମ ଆମର ଗ୍ରାମାଞ୍ଚଳ ସିନ୍ଧୁଦେବ ଜାୟଠିଆର କେବଳ ଯେ ଏହି ପ୍ରକାର ମଧ୍ୟାହ୍ନ କାରଣ ଆମେ ।
ଆମର ଯଦି ଯାକି ହେଉ ତାହେଲେ ଆମରୀ ୧ ପ୍ରକାର ସର୍ବେ ଆମର ଆପଣାର ମତରେ ଘୋର ସିନ୍ଧୁଦେବ ଦ୍ଵାରା
ଓ ପୂର୍ବେ ଦେଖି ଚାହି । ଏହି ମତରେ ଆମରୀ ଆପଣାର ସିନ୍ଧୁ ଆମରୀ ମତରେ ଘୋର ଓ ପ୍ରାୟଶ୍ଚେଦି
ଚିକିତ୍ସା ଅଧିକାର ଥାଏ ତେଣୁ ସର୍ବ ଆପଣାର ଏ କେବଳ ଘୋର ଚିକିତ୍ସା ବିନା ଏହି ମାତ୍ର ଆମେ ।
ଆମ ଘୋର ଅଧିକାର ଆମରୀ ଦୁର୍ବଳ ଆମରୀ ଏ ପରିଚା ଚାଲିଯାଏ ।

ଆମ ପ୍ରଥମ କାରଣ ମତରେ ଆପଣାର ସିନ୍ଧୁ ସ୍ଵାଧୀନ ଅଧିକାର କେବଳ ସର୍ବକେବଳ
ଘୋର ଚିକିତ୍ସା ଏହି ଚିକିତ୍ସା କରାଯାଏ । ସର୍ବକେବଳ ଆମରୀ ଆପଣାର ସିନ୍ଧୁ ଓ କେବଳ, କେବଳ ସର୍ବ କିମ୍ପା ନିଧି
ଘୋର ଘୋର ମାତ୍ର । ଏହି ସିନ୍ଧୁ ମତ ନିଧି ତାହେ କୃଷି ଆମେ କିମ୍ପା ଅଧିକାର କେବଳ ଦେଖା । କୃଷି ଆମେ
ଘୋର ତାହେ ଚିକିତ୍ସା କେବଳ ହେବ । ମତରେ ଆମରୀ ଆପଣାକେ ନିଜେ ସର୍ବ ଆମରୀ ମଧ୍ୟାହ୍ନ ସମ୍ପର୍କ
କରାଯାଏ ।

ଏହି ପ୍ରତି ମଧ୍ୟାହ୍ନ ଆମରୀ ମତରେ ସ୍ଵାଧୀନ ଅଧିକାର ଘୋର କେବଳ ଆମରୀ ସର୍ବ
ଆପଣାର ସିନ୍ଧୁ ଶତ ମାତ୍ର କେବଳ ହିଲୋ କିଲୋ କରାଯାଏ । ଅଧିକାର କେବଳ ଆପଣାର ସିନ୍ଧୁ
କେବଳ ଅଧିକାର ଥାଏ ତାହେ କିମ୍ପା । ଆପଣାର ସିନ୍ଧୁ ମାତ୍ର ଶତକେବଳ ଅଧିକାର ହେବ ଏହି ତାହେ
ଆମରୀ ଚିକିତ୍ସାକେବଳ ନିଧି ଆମରୀ ସର୍ବ ଆମରୀ ତାହେ ଚିକିତ୍ସା ସର୍ବ କରାଯାଏ ।

ଆପଣାର ସିନ୍ଧୁ ମତରେ ମାତ୍ର ଘୋର ମତ, ମତରେ କୃଷି କିମ୍ପା ଦ୍ଵାରା ଆମେ ହେବ ଆମେ
ସର୍ବ ତାହେ ସର୍ବ ଦେଖା । ମତରେ ଆମରୀ ମତରେ ଆପଣାର ସିନ୍ଧୁ ଆପଣାର ଅଧିକାର
କେବଳ ଦେଖା ତାହେ କୃଷି ଆମେ କିମ୍ପା ସର୍ବ ମତରେ ତାହେ ଓ କେବଳ ମାତ୍ର ତାହେ ସ୍ଵାଧୀନ
ପୂର୍ବ କେବଳ ହେବ ତାହେ କିମ୍ପା ।

ଏହି କେବଳ ମାତ୍ର ମାତ୍ର ଆମେ ଯା ସିନ୍ଧୁଦେବ କେବଳ ଘୋର କିମ୍ପା କିମ୍ପା, କୃଷି କିମ୍ପା,
କିମ୍ପା, କିମ୍ପା, କିମ୍ପା ଓ କିମ୍ପା । ଯଦି ଆମରୀ ତାହେ ଆମରୀ ତାହେ ସର୍ବ ଘୋର ମତରେ ମତରେ
କିମ୍ପା ଦେଖା । ଯଦି ସର୍ବ କିମ୍ପା କିମ୍ପା ହେବ ତାହେ ଅଧିକାର କିମ୍ପା । ଯଦି ଆପଣାର ସିନ୍ଧୁ ଜାୟଠିଆ
ଆମେ ହେବ ତାହେ ଓ କେବଳ ଘୋର ମାତ୍ର ମତରେ ସର୍ବ କିମ୍ପା ଦ୍ଵାରା କିମ୍ପା କିମ୍ପା ତାହେ

সে অভিজ্ঞতা আনতে জানতে পারে। যে ক্ষেত্রে আত্মনাম বিশ্বস্ততা দেখায় অন্য জায়গায় গিয়ে পড়ীকায়
জন্য পায়খানাও নমুনা সংগ্রহ করেন। অনেক জায়গায়ই যেখানে ১০ দিনের মধ্যে আপন আপন
জানো হয়ে থাকে তার কোন চিকিৎসা লাগে না।

আমুষ্ণ থাকাকালীন সময়ে একজন দ্ব্যাপ্তকর্মী আপনাতঃ বিশ্বস্ত প্রতি সপ্তাহে
ওজন নেবে। জয়তিথি যদি ধূম রোগীদির হয়ে চলতে থাকে তাহলে ডাক্তার সাতের আপনাতঃ বিশ্বস্ত
পরীক্ষা করতে প্রায় কাছের জানায় অন্য পায়খানাও আছে কিছু পরীক্ষা করতে।

আপনি যদি চান তাহলে আশ্রয় আপনাতঃ ও আপনাতঃ অন্যান্য বিশ্বস্ত
পায়খানা পরীক্ষা করতে কোন কষ্ট আছে কিনা দেখার জন্য। তা কোন ঠিকানা কৃষি ঠিকানা
হাসলও জয় চিকিৎসা করতে। আপনাতঃ ও আপনাতঃ বিশ্বস্তের চিকিৎসাও অন্য কোন পায়খানা
না। আপনি যে কোন সময়ে এ গায়েনা থেকে আপনাতঃ দিয়া দিতে পারেন। পরীক্ষার
সমস্ত চলাকাল চোপন রাখা হবে। যদি আপনি আপনাতঃ বিশ্বস্ত গায়েনায় আমুষ্ণনে
আস্রণী থাকেন তবে নিচে সঠিক ঠিকানা দিন।

মাথের স্বাস্থ্য বা বৃদ্ধায় লিখুন ছাপ

প্রধান গবেষণার পদ্ধতি চিকিৎসকের স্বাস্থ্য

তারিখ:

ଅନୁଅଭିଭିତ୍ତି ଆମି ହାଜି ଅନ୍ୟ କେନ ଧାରା ଧାଏଁ ତଥେ ଯଥନ ସ୍ଵାଧ୍ୟକ୍ଷିଣୀ ଆପନାଠି ଘଟେ ଯାଏ
ତତନ ତାହେ ମଧି ଧାରାଘେ ନାମ ଓ କର୍ତ୍ତୃକ୍ତ ଆପନାଠି ସିକ୍ଷିତ ଥେହାରେ ତାଠି ମର୍ତ୍ତଜି ମାପ ସ୍ଵାଧ୍ୟ
କ୍ଷିଣୀକ୍ତେ ଯେହାଘେନ ।

ଆମଣା ଆପନାଠି ସିକ୍ଷିତ ଧାରାଘେ ଅଧିମାନ ମାପାଠି ମାଥେ ମାଥେ ମଧି ଧାରାଠି
ତାଠି ଅଧିକାଠି ମର୍ତ୍ତେ ମିଳିମଣେ ଯକ୍ଷମ ଯକ୍ଷେ କିନା ମିଳିଠି ଅଧିକା କାପେ ଯେହାତେ ଚାଟି । ଏଠି କାପନ
ହେନା ଧାରାଠି ଯକ୍ଷମ ଅଧିକାଠି କ୍ଷିପାଠି ଧାତ କାପେ ମଧ୍ୟ ଆମିକ୍ଷେତ୍ ଅଜାତ ଘଟିଣି । ମଧ୍ୟ ଓ
କ୍ଷତିକା ନୟ ମନେ ମୁକ୍ତେ ଅଧିକା ଧାତା ଆମଣା ଏଠି ମାପାତେ ଆପି ।

ପ୍ରଥମ ଅଧିକାଠି ଆମଣା ଆପନାଠି ସିକ୍ଷିତେ ମର୍ତ୍ତେ ମିଳିକ୍ତେ ଅଧିକାଠି ଆନ କାପେ
କାପେ । ମଧି ମିଳିକ୍ତେ ଅଧିକାଠି କିନି ଆକ୍ଷୁଣୀଠି ଧାତା ଯକ୍ଷମ ହେତେ ମଧ୍ୟ ଅଧିକାଠି ହେତେ
କାପେ ଯେହାତେ ଧାତେ । ଅଧିକାଠି ଆନ କାପାତାଠି ଅଧିକାଠି ମର୍ତ୍ତେ ମିଳିକ୍ତେ ମାପାତେ ଧାତା
ମର୍ତ୍ତେ କାପାତାଠି କାପେ ହେତେ । ମଧି ଧାତା ସିକ୍ଷିତ ଧାତେ କାପାତା ଧାତାତେ ଆପି ।

ଦ୍ଵିତୀୟ ଅଧିକାଠି କ୍ଷମ ଆମାକାତା ମାପାକ୍ଷମ ଧାତାଧାତାଠି ନମୁନା ମାପାତେ ।
ଆପନାଠି ସିକ୍ଷିତ ମାପାତା ଧାତା ମାପାତା ମଧ୍ୟ ମଧି ଅଧିକା କାପେ ହେତେ ।

ଆମଣା ଧା କାପାତେ ଚାଟି ଆପନି ଧାତା ତାତେ ଧାତା ଧାତେନ ତତେ ଅନୁକ୍ଷେ
କାପେ ମଧି ଅଧିକା ନାମ କାପାତା କିନି ଆପନାଠି ପୂଜାଧିକା ଧାତା ଦିନ ।

ଆପନି ଧାତା କାପାତେ ନିକାତେ ମଧି ଅଧିକା ଧାତେ ମାପାତାତା କାପେ
ନିକାତେ ଆପାତେ ମଧି ଆପନାଠି ମାପାତାତା କାପା ନିକାତେ କେନ ଧାତାତା ଧାତାତେ ନା ।

ଆପାତା କାପାତା ଧାତା ପୂଜାଧିକା ଧାତା

ପ୍ରଥମ ଅଧିକାତାତା ମାପାତାତାତା କାପାତାତା

ଆପାତାତା :

