

AMOEBIASIS

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This is not a scientific treatise on amoebic infection: it is too incomplete to merit that term. It lacks sufficient data, accuracy of figures, and is deficient in many respects. Nevertheless, our experience in this field, though limited, seems to us important enough to pass on to other individuals with similar problems. Perhaps it may be of a little help to other workers as handicapped as ourselves.

Entamoeba histolytica, the amoeba responsible for the well-known amoebic dysentery, is a member of the sub-kingdom Protozoa of the Class Rhizopoda. It is the simplest form of animal life. A vegetative and a cystic or resting form of the amoeba can be distinguished. Whenever authors speak of the vegetative forms or "trophozoites" they mean the active living amoeba. Only the vegetative forms are true tissue parasites, causing ulceration of the intestines and later on abscesses of the liver, lungs or other secondary locations. When conditions are unsuitable for further development the cysts are formed. Cysts are said to be found only in the colon contents, and in sputum in bronchial amoebiasis. The cysts are discharged and find their way by means of food, milk or water to a new host and there begin to grow and subdivide again.

We are discussing amoebiasis, that is, amoebic infection, rather than amoebic dysentery, as we have found a large number of our patients suffering from this disease and complaining not of dysenteric symptoms but of lassitude, abdominal pain, anaemia, cough and similar symptoms. They often complain of constipation rather than of diarrhoea—the constipation which often follows dysenteric attacks. Other workers have found that amoebiasis in its chronic state is accompanied in the great majority of cases by constipation and not by diarrhoea.

Professor R. Ruge, M.D., has written a very lucid paper on the use of Yatren 105 in the treatment of amoebic dysentery. In this he mentions, "We must definitely recognize the fact that amoebic infection may run its course not only acutely in the form of dysentery, but quite often as an indolent disease without setting up any diarrhoeic symptoms, nay, further, without producing any special damage to the bowel."

Our own experience, though not extensive, bears out the above statement. We have been doing stool examinations on our patients, but formerly it was seldom requested except on what seemed to be dysentery cases. As it became more evident that many of the patients without dysenteric symptoms were suffering from amoebiasis, requests for stool examinations increased. Gradually it became evident to us that this infection is so widespread in this district, and positive findings helped to explain away so many formerly

obscure symptoms, that stool examinations are now done almost routinely on every patient admitted to the hospital.

Statistics

To obtain a small degree of accuracy, I am giving figures only for the eight-month period from January 1st to August 31st 1940. The figures are not perfectly accurate nor sufficiently comprehensive. I will try to explain the inadequacies as I go along.

During this eight-month period, we had exactly 1,000 patients treated in the hospital and 17,363 out-patients. We did 450 stool examinations, of which about 300 were on the in-patients and 150 on the out-patients. But fewer than 300 in-patients had stool examinations, because in many cases two or more examinations were made for the same patient. For instance, a patient will have a positive stool, and after a course of treatment another specimen will be examined and found negative. All I can say is that of the 300 specimens from in-patients 180 were positive for *Entamoeba histolytica* or their cysts or both. I cannot give accurate figures on the number of positives found in the 150 specimens from out-patients, but my impression is that the percentage is even higher than that of the in-patients, as examinations in the dispensary are seldom requested except on obviously dysenteric patients. The out-patient work leaves much to be desired. To do laboratory work for these patients adequately would require much more cooperation from the patients and more time and help for the technician. It is surprising, however, to note the change among the patients themselves, without propaganda on our part. One patient tells another. We now have people coming in of their own accord and requesting stool examinations—a thing unheard of a few months before.

Of the in-patients an increasing number are coming in of their own accord to be treated for dysentery. The vast majority of our cases in the past, however, were maternity cases who seemed to develop acute symptoms just before or immediately following confinement. Lowered resistance is a well-known predisposing factor in bringing to light an unsuspected or latent infection. In our pre-natal clinic a very high percentage of the cases of "anaemia of pregnancy" are found to have amoebiasis.

Carriers

There is apparently a large number of so-called carriers among Indians in this section of India: that is, persons who harbour the infection and pass cysts, but do not suffer from clinical symptoms of the disease. These persons are a source of infection to others. In amoebic bronchitis the sputum contains not only the vegetative forms but a great number of cysts, so that these patients are a serious source of contamination. A healthy baby will be infected from its mother. Those who handle food can easily spread the disease. In one of our cases, a European child, we found both the parents negative, but in the ayah's stool we found active

amoebic infection. The ayah seemed to be perfectly healthy and the stool normal in appearance, except on microscopic examination.

Amoebiasis in Infants and Children

I do not wish to go into the causes of diarrhoea in infants. That is beyond the scope of this paper. But, judging from our findings, I think that amoebiasis as a cause is often overlooked, especially in districts where laboratory examinations are not made. Contrary to the opinion of some medical authorities, we have found amoebic dysentery extremely common in children and infants, even those only on a milk diet. We have found motile amoeba in babies less than ten days old. In recent cases we have also examined the mother's stool, although she may have had no complaints or symptoms, and in almost every case we found that she also was infected. The fact that the infant is supposed to be getting only breast milk does not mean anything, as we see babies putting anything in their mouths and playing around on the floor.

Of the 17,363 dispensary patients treated in this eight-month period, a very high percentage were infants and children suffering from dysentery, diarrhoea, or other gastro-intestinal complaints. Basing our conclusions on the few who had stool examinations, I feel that at least 60% of them have amoebiasis. Including our adult patients we have a very large number of the same patients coming to the dispensary weekly or fortnightly—one time complaining of diarrhoea, the next time of cough, the next time of constipation or abdominal pain. Knowing what we know now about amoebic bronchitis, I would not be surprised if that is not an important cause of these chronic coughs. At any rate, it seems a great waste of cough sedatives, diarrhoea mixtures and cathartics unless we get at and treat the underlying infection.

Amoebic and Bacillary Dysenteries

It is true that in some districts the bacillary type of dysentery may predominate over the amoebic, but our clinical and laboratory findings in almost all cases point to amoebiasis. The marvellous response to treatment seems to confirm the diagnosis. But a few points on differentiating between the two infections will not be amiss. I will again quote Professor Ruge in brief:

"Clinically and epidemiologically the two forms of dysentery may be thus distinguished: The bacillary form is usually epidemic in distribution, the amoebic is sporadic. Bacillary dysentery is, in the great majority of cases, acute in onset and course, whereas amoebic dysentery is often gradual in onset and tends to chronicity."

Speaking of the gross examination of the stool Professor Ruge says, "In the amoebic form the blood-stained mucous discharge is diffusely red and resembles raspberry jelly, whereas in the bacillary the mucus is untinged and of a milky appearance, blood is present in streaks, and there is no diffuse staining of the mucus. The milky opacity is due to the number of leucocytes entangled in the mucus."

In our experience we have found active amoeba or cysts in every case where the bloody mucus followed the description given

by Professor Ruge. In some cases the bloody mucus will be teeming with amoeba or cysts, while none will be found in a piece of solid faeces in the same specimen. That is why in a specimen sent to the laboratory in a container the report may be negative although the patient may have amoebic infection. A solid portion of the specimen was put in the container to be sent to the laboratory and the mucus and blood avoided, as it was a "stool" specimen that was called for. I have tried to get a specimen brought in from some patient and received the answer, "But she has no motions. She passes only mucus and blood." Which, of course, is just what we needed for examination. We must remember, though, that in many cases even of amoebic dysentery, we do not always see mucus or blood with the naked eye; in fact the stool at times appears quite normal.

Hospital Technique

Our present technique for hospital patients is this: When a stool specimen is ordered the nurse endeavours to obtain the specimen from the patient between seven and twelve in the morning. At that time I am available, so the examination can be made at once. If the patient has diarrhoea there is rarely difficulty in obtaining a specimen during those hours. If the patient is constipated a saline cathartic is given the first thing in the morning. In fact, if the patient is constipated no amoeba or cysts might be found in the formed stool but will show up after a saline cathartic. In any suspected case of amoebiasis in which the first specimen is negative it is advisable to do repeated specimens after catharsis. We would probably have obtained an even higher number of positives had we followed that procedure more frequently. If the examination is urgent and no specimen has been obtained, the doctor frequently orders a small saline enema—which is often quite satisfactory for examination. No oily cathartics nor soap-suds enemas should be given as they interfere with the microscopic examination.

The entire specimen is brought to the laboratory at once in the covered bed-pan. The technician can then, with dissecting forceps, select a suspicious portion and transfer it to a glass slide and examine it at once under the microscope. We do a simple microscopic examination of the unstained wet specimen, emulsifying with saline if necessary. We find this sufficiently accurate for routine purposes.

Textbooks, especially those written for more temperate climates, go into much detail about keeping the specimen warm, diluting with warm saline, and so on. As we examine the specimen at once, and as the temperature of our laboratory these past few months—much to our dislike—ranges from 100 to 110 degrees during the daytime, we do not worry about the specimen getting chilled.

Differentiation from *Entamoeba Coli*

As this paper is not written for the physician or medical technologist, I will touch only lightly on the diagnostic features in microscopic examination of infected material. In actual laboratory

practice the only difficulty seems to be in distinguishing between *Entamoeba histolytica* and *Entamoeba coli*; the latter supposedly harmless. A few points of differentiation are as follows. In the amoeba of dysentery the active forms are slightly smaller than in *Entamoeba coli*; they usually contain several red blood cells but no bacteria or vegetable matter, while the *Entamoeba coli* rarely contain blood cells and are usually packed with bacteria and vegetable debris. The cysts are harder to distinguish, but if found they are usually of the amoeba of dysentery, as *Entamoeba coli* cysts are rarely found in the stool specimens. The pseudopodia in the motile amoeba of dysentery are characteristically flask-shaped; those of *Entamoeba coli* are more rounded. However, as less than half of the specimens show active motility even when examined at once, that must not be relied upon for diagnosis or many positives will be missed.

Complications

Amoebiasis associated with other conditions, as tuberculosis, pneumonia, anaemia of pregnancy, or other intestinal conditions, is apt to be very severe and more difficult to clear up. As we noted before, in the last months of pregnancy or immediately following delivery, an unsuspected or latent infection often becomes very acute and complicates recovery.

Amoebic hepatitis is rather common, but in our series of cases we came across only one case of liver abscess. Amoebic abscesses of the lungs and less frequently of the brain are spoken of often in the literature. Amoebic bronchitis seems extremely common among our patients. Professor Ruge calls attention to the fact that amoebic appendicitis is distinguished from ordinary appendicitis by the more or less high degree of eosinophilia found in the blood slide. In the few cases we had in which we also did a differential blood count our findings were the same. We have had two definite cases of amoebic cystitis, both diagnosed clinically and confirmed by laboratory diagnosis—the amoeba being found persistently and in large numbers in the catheterized specimens. Local or general peritonitis caused by amoebiasis is also quite common and probably overlooked or the cause attributed to something else.

It is only very recently, after studying Professor Ruge's account of the prevalence of amoebic bronchitis, that we began to do sputum examinations for amoeba on infected cases who also had a cough. We have done too few to form definite conclusions, but in the three tuberculous patients now in the hospital who also have amoebic dysentery we found not only acid-fast bacilli but also numerous amoeba or cysts in the sputum specimens. In some other patients who have a cough as well as amoebiasis we again found amoeba or cysts in the sputum, but not in all cases. It seems that every tuberculous patient we have had for some months has also been found to have amoebiasis. Was the amoebic infection there first or the tuberculous infection? The prognosis of our tuberculosis should be more hopeful if we can eliminate the amoebic infection. Perhaps the incidence of tuberculosis (which

is quite high) would be lowered in this city if we could lessen the incidence of amoebiasis. Theoretically it should.

Conclusions

Judging from the high incidence of amoebiasis found in our patients and contacts and the serious sequelae, we consider amoebic infection to be the major health problem of Rawalpindi City.

Considering the primitive sanitary conditions prevailing in the city, along with the high incidence of infection, we think that the population of Rawalpindi City is overwhelmingly exposed to infection.

EMPLOYMENT BUREAU

Required. A Sister Tutor for the King Edward VII Memorial Hospital, Parel, Bombay, on Rs.140-10-180, plus Rs.10 p.m. as uniform and dhobi allowance. Free furnished quarters, with free board and leave, provident fund etc. under Municipal Service Regulations. One year's probation on appointment. Apply to the Dean of the Hospital, with all particulars regarding age, qualifications, experience and photograph. Candidates called for interview will have to bear their expenditure.

The Lady Minto's Indian Nursing Association has both temporary and permanent **vacancies** for fully trained nurses. The latter must be willing to sign a three years agreement. Applications are open to Missionary Nurses who are seeking openings during the War. Full information on application to Miss C. Wilson, Chief Superintendent, Lady Minto's Indian Nursing Association, Viceregal Estates, Simla.

Required. A Nursing-Superintendent for a Mission Training School in Ceylon. Apply Box No. A.48, T.N.A.I., Valley View, Coonoor.

Required. Two well qualified Indian Nurses over 25 years of age, for Mission Training School in Ceylon. Must be experienced and able to teach. Must speak English and Tamil. Apply in own handwriting, with copies of certificates and references, to Box No. A.48, T.N.A.I., Valley View, Coonoor.

Required. A European Nursing-Sister with State Certified Midwife's certificate, as soon as possible, for the Welsh Mission Hospital in Shillong, Assam, to relieve, for from six to nine months or longer. Apply direct to the Senior Medical Officer.

Required. Indian Trained Nurse, (Tamil), married, for Mission Dispensary, Kolli Hills. Apply Superintendent, Vazhavanthi, Namakkal.

Required. A Nurse registered in Bombay Presidency, over 35 years of age, with a good understanding of the principles of asepsis, for a post of "In-Charge Nurse" in the Tubercular and Segregation Ward. Apply directly to The Director, Mission Hospital, Miraj Medical Centre, Miraj, S.M.C.

Required. A Bombay Presidency registered Woman Nurse for Operating Room work. Apply directly to The Director, Mission Hospital, Miraj Medical Centre, Miraj, S.M.C.

Post Required. Nursing-Sister with English and American qualifications requires post as Nursing-Superintendent. Apply Box No. B.63, T.N.A.I., Valley View, Coonoor.

Post Required. Nurse Midwife, Bombay Presidency, requires staff nurse's post in Training School or Nursing Home. Apply Box No. B.71, T.N.A.I., Valley View, Coonoor.