

TYPHOID FEVER: CLINICAL FEATURES

H. R. ACKERMANN, M.B., CH.B. (CAPE TOWN), T.D.D. (WALES); R. RABKIN, M.B., CH.B., D.P.H. (CAPE TOWN); and A. CAVVADAS, M.B., CH.B. (CAPE TOWN); *City Hospital for Infectious Diseases, Cape Town*

DIAGNOSIS

Typhoid fever has two components, a bacteraemia with its commensurate toxæmia, and an enteritis. While either may predominate, the commonest early symptoms are of bacteraemic origin—persistent headache, apathy, anorexia, and generalized body pains. A harsh, dry cough is common and epistaxis occurs in about 10% of cases. Even at this early stage some abdominal complaint is present—usually constipation, occasionally diarrhoea and abdominal discomfort.

On examination, pyrexia with a relatively slow pulse is a constant finding, plus a dry furred tongue and a slightly distended abdomen. Both 'rose spots' and splenomegaly are important diagnostically, the former invisible on coloured skins and neither constantly present. In South Africa, any patient with an illness of insidious onset running a continuous pyrexia of up to 104°F for over a week is most likely suffering from typhoid fever.

Laboratory confirmation should always be obtained, no matter how certain the diagnosis. This is perfectly possible even in a remote village. In hospital practice the following tests are demanded:

1. Blood culture for typhoid organisms in bile broth.
2. Stool and urine culture.
3. The Widal test, which becomes positive in the second week. Later, when a higher titre would be invaluable, chloromycetin treatment may interfere with development of agglutinins.
4. A white blood count, which shows a characteristic leucopenia of 3,000 - 5,000 white blood cells per c. mm.

TREATMENT

The object of treatment is twofold, viz. (a) to prevent the spread of infection, and (b) curative.

Prevention of the Spread of Infection

Typhoid fever is a disease of filth—faecal and urinary contamination of food or drink. Isolation of a case offers an excellent means of preventing spread, and admission to an infectious diseases hospital is the best isolation. Where a hospital is not available, to set aside a house or even a tent, under supervision, is far preferable to having numerous ignorant family members exposed to the risk, or certainty, of acquiring the disease too. It is possible to obtain the service of an immune nurse who is trained to observe bed-isolation with the use of gowns and disinfection technique, and is able, moreover, to dispose safely of the highly infectious excreta. This last service is so important that it cannot be left to chance. Precise arrangements should be

made to deal with the disposal of excreta, and to ensure that all crockery and cooking utensils are sterilized after use. The attendant should not handle food eaten by other people. Flies must be shut out from the sickroom.

Curative Treatment

Where the clinical picture is one of typhoid fever (pyrexia for over a week, headache with apathy, distended abdomen, splenomegaly and leucopenia), specimens should always be sent for laboratory confirmation, but treatment must start immediately without waiting for the results. The institution of treatment during the early bacteraemic stage, before the Peyer's patches have sloughed to form ulcers, makes all the difference between straightforward recovery, on the one hand, and non-recovery or recovery with complications and sequelae, on the other.

Curative treatment augments but does not replace preventive measures. Full treatment must be applied in every single case irrespective of race or station—failure will undermine the safety of every member of the public.

1. Drug Treatment

Chloromycetin (chloramphenicol) has revolutionized the outlook in typhoid fever, and it is essential to give it as early as possible. It is taken orally at 8-hourly intervals; but if vomiting interferes with taking it, or excessive diarrhoea with its absorption, it must be given by the intramuscular route (or, if the new soluble preparation proves satisfactory, the intravenous).

The starting dose in an adult depends on the weight—for an average female 0.75 g., for an average male 1 g. 8-hourly. In children, 40-50 mg. per lb. body-weight per day is divided into three 8-hourly doses. This dosage is to be continued until the temperature remains normal. This usually takes 4-7 days. Then the 8-hourly chloromycetin is continued, but in exactly half the previous dosage. The total duration of the course is 14 days, after which the drug is stopped. Lengthening the period of treatment beyond 14 days does not materially reduce the relapse rate, but shortening does increase it.

Salicylate (aspirin) must most specifically be avoided. It causes a sudden drop in temperature accompanied by serious signs of collapse, with sweating, vomiting etc.

Chloromycetin has reduced the mortality rate of typhoid fever from about 10% to well under 1%, and the amount of suffering correspondingly. Nevertheless the treatment time in bed remains much the same as before, and a very real danger arises from the fact that a patient with a bowel full of ulcers may feel relatively well.

2. Rest

In order to get the perfect rest which materially influences not only the patient's comfort, but his recovery too, good nursing remains of prime importance. This means absolute rest, during which the patient must be fed and washed and have his every need attended to. Special attention is paid to oral hygiene and the prevention of bedsores. Any movement of the patient must be minimal and gentle (never sit him upright or allow him out of bed), particularly after the second week, when the ulcers of the small bowel are deep, necrotic and ripe to bleed or perforate. It can be understood how movement of a patient by ambulance for any distance under these conditions is attended with the greatest danger, and should be avoided at all costs.

The temperatures and pulse should be taken 4-hourly; this chart often supplies the first indication of a perforation or haemorrhage of the bowel. A fluid intake/output chart is also valuable in indicating the myocardial integrity, kidney filtration, etc.

A typhoid patient needs constant watching by a competent nurse. Any complaint of abdominal pain or vomiting, a sudden drop in temperature or rise in pulse-rate, and the presence of blood in the stool, need immediate reporting. A rise in temperature above 104°F calls for tepid sponging in order to avoid hyperpyrexia.

3. Diet

The old starvation diet, with its attendant wastage, debility and deficiencies, has given way to the rational modern treatment in which adequate, non-residue feeding is given. For the first few days the diet consists mainly of milk fortified with glucose. This is given at 2-hourly intervals during the day (not at night), and should not exceed 8 oz. per feed for an adult, 4 oz. for a child. The milk may be flavoured and fortified with cocoa, ovaltine or other preparations. A glass of fresh orange juice should be given daily, or maintenance vitamin C.

Strained porridge or soup can be added, and jelly, custard, and cream are allowed, together with plain chocolate, glucose sweets and butterscotch to give the necessary dietary requirements. After a few days, plain biscuits (Marie), bread and butter (no crusts), soft-boiled or poached eggs may be added. Additional foods such as minced chicken or fish, mashed potatoes or pumpkin, farinaceous puddings and 'pureed' fruit are added quite soon, until the patient has virtually a full diet and only foods leaving bulky residues are avoided, e.g. tomatoes, cabbage etc.

A sufficient calorie and fluid intake is important. Dehydration may necessitate the giving of fluid by intravenous drip. Debilitated patients need protein in concentrated form.

THE COURSE OF THE DISEASE

In the uncomplicated case, the temperature becomes normal and the patient feels much better in 4-7 days. This neither means that the drug treatment can be stopped, nor that the absolute rest can be relaxed. The bowel remains full of ulcers. Bed rest for 3 weeks must be enforced, often against a patient's wishes, and only then are more pillows allowed, together with the movement in bed. By the middle of the 5th week from the commencement of treatment the patient is allowed to be out of bed, and he goes home at the end of the week provided he is free from typhoid organisms.

Complications

Toxaemia may be severe fairly early in the bacteraemic state, and is the commonest cause of death, through myocardial failure, which is evidenced by prostration, a gallop-rhythm, bradycardia and ECG changes. Although cortisone is rationally dangerous to a patient with an ulcerated bowel, and should never be used lightly, there are exceptional cases in which death from toxaemia would appear imminent, and in these cortisone has at times been life-saving. We repeat, cortisone has no place in the routine treatment of typhoid fever. The later development of the 'typhoid state' of the text-books has largely been abolished by chloromycetin.

Perforation of the bowel, as already stated, is often precipitated by movement. The symptoms are abdominal pain, sometimes vomiting and collapse. The signs are a rise of pulse rate with a drop in temperature, abdominal tenderness and increasing rigidity, absence of bowel sounds and disappearance of liver dullness. It is confirmed by the finding of air under the diaphragm on an X-ray plate taken in the erect position. Conservative treatment has totally superseded operation, and a death is now very exceptional. Treat by placing the patient in the Fowler's position,* start continuous gastric suction, and give all fluids intravenously and all treatment parenterally. In addition to intramuscular chloromycetin, also give streptomycin and penicillin similarly. This regimen is continued until bowel sounds return, when ordinary treatment can be resumed. In a few cases a pelvic abscess forms, and this may have to be surgically drained well on in the convalescent stage—when the patient is fit to stand it.

Bowel haemorrhage is a catastrophe often resulting from injudicious transporting of a patient. The diagnosis can often be made before the passage of tarry melaenic stools or bright red blood in the stool. There is no abdominal tenderness or rigidity, the bowel sounds are present—sometimes even increased—and the liver dullness is normal. An immediate blood transfusion may be necessitated by the severe loss of blood. Where the bleeding is not so severe, it may be wise to wait till it has stopped, and then to transfuse if necessary. All solid foods per mouth are entirely withheld, and only fluids given.

Relapse is far less common since chloromycetin treatment has become standard, but does still occur. The usual time is in the 4th or even 5th week, when the patient is almost ready to leave hospital. The temperature rises and all symptoms and signs of the disease return, often in less pronounced form. Chloromycetin treatment is luckily as effective as in the original attack, and a full course must be repeated.

Meteorism, or extreme abdominal distension, is not only distressing, but embarrasses both pulmonary and heart functions. It is useful treatment to citrate the milk feeds.

Diarrhoea, when excessive (say more than 10 stools per day), may prevent the absorption of chloromycetin, which should then be given by intramuscular injection. Intravenous feeding may be required.

Pneumonia. Lobar pneumonia occasionally occurs and responds well to chloromycetin.

Cholecystitis. Pain and tenderness in the right hypochondrium is common in typhoid fever. It has to be

* The head of the bed raised 18 or 20 inches.

distinguished from a perforation. The tenderness is localized over the gall-bladder, and liver dullness persists.

Femoral thrombosis is very rare if gentle leg movements are carried out daily.

Peripheral neuritis used to be common, probably as a result of dietary deficiency. With increased feeding it is never seen today.

Septic parotitis is preventable and is an indication of poor oral hygiene.

Post-typhoid psychosis is of toxic origin. It is rare and responds to shock therapy.

Other complications such as meningitis, osteitis and typhoid abscesses are very rare.

RELEASE FROM ISOLATION

After the initial diagnostically important stool culture for typhoid bacilli, it is pointless to have further bacteriological examinations made until after treatment is completed. Then it becomes imperative once more to know whether organisms continue to be excreted in the faeces and urine; that is to say, whether the patient has become a carrier. At the end

of the 3rd week blood is taken for the Vi agglutination test, and specimens of faeces and urine are sent to the laboratory at intervals of 5 days. If the Vi test is negative, and no typhoid bacilli are found in 3 specimens of faeces and urine, the patient can be released from hospital or isolation at the end of the 5th week.

Carriers. If the Vi test proves to be positive, or if the stool or urine is found to contain typhoid organisms, the patient needs more extensive investigation to determine whether he is a carrier. It is good practice to submit 10 stools at intervals of 5 days; all must prove negative if the patient is to be released from hospital. If any are positive, then the patient is a carrier, and further efforts should be made to rid him of organisms. Chloromycetin has often proved ineffective in eradicating the organisms in the urinary or faecal carrier state, but it should be given a good trial—say 3 courses with an interval between. Achromycin should also be given a trial before surgical measures are invoked, as they are in some cases. All these may prove ineffective and the resulting permanent carrier is a health hazard needing continuous control.