TYPHOID FEVER : PREVENTIVE MEASURES

R. M. LANGERMAN, M.B., CH.B., D.P.H. (CAPE TOWN), *Assistant Medical Officer of Health, City of Cape Town*

Typhoid fever is world-wide in distribution. Generally speaking, the disease may become endemic wherever the water supply is subject to human excremental pollution, the standard of sanitation is low, the people are less enlightened, and overcrowding is present. By this standard, many rural areas in South Africa, particularly where there are big aggregations of Bantu, and also the peri-urban areas of the cities, where there is no water-borne sanitation or adequate, safe, reticulated, water supply, may not only be considered endemic, but even potentially epidemic. As a large proportion of the labour force in the cities and bigger towns is drawn from these areas, the situation can be likened to an unexploded bomb in the back garden, surrounded in some instances by an ornamental trellis.

The reservoir of infection is constituted by the permanent carriers, the transient carriers, the ambulatory cases, and also those diagnosed cases for whom there is no adequate isolation. The problem of preventing the spread of typhoid fever is one of pure basic hygiene, consisting in the blocking of the various paths by which the causative organism might pass in the faeces or the urine of an infected individual into the mouths of others. These routes are:

1. *Direct*, in which foodstuffs are contaminated with faeces or urine by the unwashed hands of carriers or cases. This may also occur with raw fruit and vegetables; urination in the lettuce patch and the use of human excreta as manure is not unknown in market gardens in some areas.

2. *Water supplies* may be contaminated by sewage from a mixed population or excreta from carriers or cases, the effects depending upon the degree of contamination. Gross contamination of public supplies may give rise to an epidemic explosive in character.

3. *Milk supplies* may be directly or indirectly contaminated by carriers or cases, with consequent infection also of milk products, such as cream, cream cakes, ice cream, immature cheese, etc. With infection of milk from a bulk source explosive epidemics may occur.

4. *Flies* may act as vectors. After they have eaten infected excreta they may regurgitate it onto foodstuffs to which they are attracted, or they may infect the foodstuff (including milk) by contamination from the surface of their legs or bodies.

Typhoid fever may occur at any age, but is commonest in older children and young adults. The incubation period is usually 9–14 days, but may range from 1–3 weeks.

The illness commences with malaise, lassitude, headache and pyrexia. This stage of vague toxaemia (bacteraemia) lasts about a week, during which time the patient is generally non-infectious. Having regard to the prevailing conditions of hygiene or the occurrence of confirmed typhoid cases in the district the practitioner should make use of available laboratory facilities, for blood culture is the only means of establishing the diagnosis beyond doubt in this important non-infectious stage.

After isolation of the case, all contacts should be observed for a period of 3 weeks. Those employed in the handling or preparation of foodstuffs should be excluded from this occupation during the period of observation.

The Permanent Carrier

It is the permanent carrier who is the original source of every outbreak. There are usually no short cuts in detection, and a thorough investigation of all the patient's movements and places of eating in the month before the onset of illness is frequently necessary before any clue can be obtained. More often than not the individual and his family are of a low standard of intelligence and extreme patience is required.

On detection, a carrier should be admitted to an infectious diseases hospital, where treatment should be given to bring the carrier condition to an end, if possible. Before discharge from hospital, permanent carriers are given instruction regarding their danger to others, the need to wash their hands after visiting the toilet, and if they reside in unsewered areas, the necessity for disinfecting the stercus pail after defaecation. They are forbidden to handle or prepare any foodstuffs, even in their own homes if this is possible. They may not go away on holiday, change their address, or except in emergency enter hospital without informing the local authority.

They should be visited at least once a month and the whole lecture repeated *ad nauseam*. Carriers often become

forgetful; they seem to live a long while and advancing years and forgetfulness frequently walk hand in hand.

The real danger to the community, however, is still the undetected carrier, and therefore the search must never cease.

General Preventive Measures

1. The provision of a safe, reticulated, piped water supply. Wherever water is suspect it should be boiled or adequately chlorinated before use.

2. The provision of a safe milk supply. Inspection from producer to consumer, with compulsory pasteurization and Vi testing of all personnel engaged in the plants (and also in ice cream factories), is the ideal. Any suspect milk supply should be boiled before use.

3. The provision of water-borne sanitation—or, where this is not possible, latrines which are fly-proofed and, especially in the rural areas, are made more comfortable than the surrounding bush.

4. The protection of all foodstuffs from contamination by dust, dirt, flies, etc., and the careful washing of fruit and vegetables before eating.

5. Adequate cooking and refrigeration of foodstuffs in order to avoid needless proliferation of organisms.

6. High standards of personal hygiene on the part of all engaged in the handling and preparation of foodstuffs, with particular reference to short nails and the washing of hands with soap and water after visiting the toilet, and before eating. Much direct typhoid infection would be prevented if habitual attention to the hands at all times were inculcated in the whole population. A nation-wide campaign, starting in the schools and spreading to every walk of life, would pay handsome dividends.

Special Preventive Measures

1. It is essential for the local authority to keep a register of all established permanent carriers. The phage type should be recorded; this may give valuable information in the investigation of typhoid outbreaks.

2. The search for the undetected carrier must never cease.

3. Active immunization may protect the individual against a clinical attack of typhoid, but not from infection or the possibility of a resultant carrier state. It is advised in the following conditions:

(*a*) It is indicated for persons who propose to reside in endemic areas where the standard of sanitation is low.

(*b*) As a routine it should be given to occupants residing in the homes of known permanent carriers.

(*c*) It is indicated selectively where there is a breakdown in the general preventive measures.

(*d*) Mass immunization has its place in the face of regional or national disasters, such as floods, droughts, earthquakes, wars, etc., in which there is a breakdown of essential services. If it is advised simply because of a high incidence of typhoid, it is liable to give a false sense of security, and completely subordinate the all-important principles of personal and general hygiene. It gives the impression of a tacit admission of defeat.