

16. Typhoid/Paratyphoid

(*Urgently Notifiable*)

Description: Classic typhoid fever is a serious illness, which untreated is likely to be life threatening. Antibiotics are very effective when administered in a timely fashion. More than 20 million cases a year are reported of whom 200,000 die but these are invariably in parts of the world with limited access to acute medical services and without access to frontline antimicrobial agents. The disease lasts several weeks and convalescence takes some time. Paratyphoid fever has a very similar clinical picture to typhoid but is generally milder and of shorter duration.

Annual Numbers: About 10 cases each of typhoid and paratyphoid per year.

Seasonal Distribution: There is no seasonal pattern of incidence.

Causative Agent: The causative agents are *Salmonella enterica* subsp. *enterica*, serovar Typhi (*Salmonella* Typhi) of which there is only one serotype and *Salmonella enterica* subsp. *enterica*, serovar Paratyphi (*Salmonella* Paratyphi), subtypes A and B and in extremely rare cases, C.

Reservoir: The only reservoir for *S. Typhi* and *S. Paratyphi* is the human gastrointestinal tract of cases carriers and other excretors.

Transmission

Usually via the faecal-oral route through ingestion of contaminated food or water.

Outbreak Potential: *S. Typhi* and *S. Paratyphi* have high outbreak potential whether transmitted by food or water.

Incubation period: The incubation period of typhoid is typically one to three weeks (range 3-60 days). The incubation period is dependent on the size of the inoculum. The incubation for paratyphoid is 1-10 days.

Infectivity: Cases are infectious when shedding, but infectivity is much greater when symptomatic. Untreated cases can excrete for many months. Carriage for more than one year is not uncommon in less developed countries. Infectivity starts in the first week of symptoms and continues until microbiological clearance. Ten percent of untreated cases are shedding at three months and between 2% and 5% of untreated cases will go on to become permanent carriers.

Epidemiology: In Ireland cases are generally imported from endemic countries. The bacterium is ingested (usually by eating or drinking contaminated food or water). Incidence of typhoid and paratyphoid are highest in South-central and South-eastern Asia and in Southern Africa. The remainder of Asia and Africa, along with Latin America and the Caribbean are medium endemicity areas.

Exposure-prone groups: International travellers returning from areas of high endemicity and food handlers.

Clinical Features

Fever, rigors, headache, cough, rash (rose spots in <20% of cases, undetectable in dark skinned people), variable gastro-intestinal symptoms: constipation (early); diarrhoea (late). Complications (generally in the 3rd week) include intestinal haemorrhage (2%), GI perforation (1-4%), disseminated intravascular coagulopathy (DIC) and renal failure in severe cases. Five to ten percent of cases relapse despite antibiotics.

Clinical Management of Cases

Enteric precautions.

Admission to hospital and strict isolation is advisable.

Fluoroquinolones are generally the drug of first choice but because of emerging antibiotic resistance it is prudent to ensure that antibiotic sensitivity studies are undertaken on all isolates. Choice of antimicrobial therapy should normally be made in consultation with a Consultant Microbiologist or Infectious Disease Physician, bearing in mind the balancing of risks and benefit (i.e. fluoroquinolones in children and the potential for reversible arthropathy). The case should be notified to the local Department of Public Health. It is important to determine if the case is aware of similar cases suggesting the possibility of an outbreak. Determine if case is in a risk category.

Typhoid and Paratyphoid are severe systemic illnesses and cases and contacts who are food handlers must not work with food until satisfactorily treated and microbiologically clear

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Public Health Management of Cases

Obtain a complete food and three-week travel history (use the HPSC Enhanced Typhoid/Paratyphoid investigative form to guide history taking).

Cases should undergo further investigation if no travel to an endemic country within the previous three weeks. Determine if linked cases. Food hygiene re-education is necessary for food handlers.

Public Health Management of Contacts

All household contacts and others with similar exposures to the case in the month prior to symptom onset should be screened.
Contacts outside the home in risk groups should also be screened.

Vaccination: Typhoid vaccination is of limited effectiveness and should be reserved for:

- Travellers to countries in Africa, Asia, Central and South America and South East Europe, and to other areas where hygiene is likely to be poor.
- Laboratory workers handling specimens which may contain typhoid organisms

Typhoid immunisation is **not** recommended for contacts of a known typhoid carrier or for controlling common-source outbreaks.

Excretors/Carriers

All excretors/carriers identified should be given written hygiene advice.

Quinolone treatment for clearance should be undertaken under the guidance of an appropriate specialist. If, after several unsuccessful treatments, a patient continues to excrete, a risk assessment should be carried out with consideration given to:

- Safe arrangements for continuing in work or alternative occupations (e.g. re-deployment)
- Continuing need for strict hygiene both within the household and at work (see HPA Guidelines below).

Exclusion and Microbiological Clearance: The schema below describes the parameters for exclusion and microbiological clearance for typhoid and paratyphoid cases and contacts:

Cases

- For diagnosis of possible cases: ONE faecal sample ASAP and exclusions for all cases as per routine gastrointestinal '48 hours after last symptom' rule.
- For clearance of probable/confirmed cases in risk groups: THREE samples 48 hours apart, starting at least ONE week after completion of treatment. Consider exclusion or redeployment until clearance.
- No clearance necessary for cases not in risk group.

Contacts

- If the case's infection is likely to be travel-related: all co-travelling contacts require ONE faecal sample ASAP for screening but no exclusion unless symptomatic; all other non-travelling contacts require "warn and inform" information, but no screening samples or exclusion unless symptomatic. All contacts managed in the same way, irrespective of whether in a risk group.
- If the case's infection is not thought to be travel-related: contacts require "warn and inform" information and may require ONE faecal sample for screening purposes to investigate source.
- If any contacts have a positive faecal sample or become symptomatic, manage as a case with

appropriate clearance/exclusions depending on risk group or activities.

Resources: Cases, contacts and carriers should be managed in accordance with the HPA's Public Health Operational Guidelines for Typhoid and Paratyphoid (Enteric Fever) available at http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1317132464469.

Notifiable: **urgently** to the local [Medical Officer of Health](#).