

## Typhoid and Paratyphoid fever

Typhoid fever is the result of systemic infection mainly by *Salmonella typhi* found only in man. The disease is clinically characterized by a typical continuous fever for 3-4 days, relative bradycardia with involvement of lymphoid tissues and considerable constitutional symptoms. The term “enteric fever” includes both typhoid and paratyphoid fevers. The disease may occur sporadically, epidemically or endemically. Paratyphoid fever is a similar illness caused by *Salmonella Paratyphi* A, B, or C. The incubation period of typhoid and paratyphoid infections is 6–30 days.

### Epidemiology:

Typhoid fever occurs in all parts of the world where water supplies and sanitation are sub-standard. The disease is now uncommon in the developed countries where most of the cases that occur are either acquired abroad or imported by immigrants. In UK, typhoid fever has been brought very close to eradication with approximately one case per 1000000 population, which is perhaps the lowest incidence of typhoid in the world.

In the United States, it is estimated that approximately 5,700 cases occur annually. Most cases (up to 75%) are acquired while traveling internationally. Typhoid fever is still common in the developing world, where it affects about 21.5 million persons each year.

Agent:

*S. typhi* is a Gram- negative, aerobic, non-spore forming organism, it can survive in water for 7 days, in sewage for 14 days, and in ice-cream for 1 month, in warm dry conditions most of the bacilli die in a few days, boiling of water destroys the organism.

*S. typhi* is the major cause of enteric fever, *S. paratyphi A* and *Paratyphi B* are relatively infrequent. *S typhi* has three main antigens, O, H and Vi

Reservoir: Humans are the only reservoir of infection

Transmission:

- Food handlers, especially if they are carriers and they are responsible for many outbreaks of the disease.
- Close contact with a patient may result in infection being transmitted by hands or fomites such as towels.
- Contamination of water for example through sewage system (the cause of major outbreaks)

- Ice-cream, other milk products, ice, fruit, vegetables.
- Flies.

Clinical feature: prolonged high fever, anorexia, cough, headache, muscle pain, delirium, abdominal pain, rash, diarrhea, occasionally constipation, Rose spots (abdominal papules), tender, hepatosplenomegaly, intestinal hemorrhage or perforation as complication.

Diagnosis:

The initial diagnosis often has to be made clinically. The combination of a history of risk for infection and a gradual onset of fever that increases in severity over several days should raise suspicion of typhoid or paratyphoid fever.

- Leucopenia; *S. typhi* isolated from blood culture in the first week of disease, from feces in the second, and from urine in the 3rd and 4th weeks.
- Duodenal Aspiration culture where found in bile.
- Widal test (O & H agglutination) become + ve after the 10th day.

The Widal test is unreliable but is widely used in developing countries because of its low cost. It is a serologic assay for IgM and

IgG to the O and H antigens of *Salmonella* Typhi, but is not specific and false positives may occur.

#### Treatment:

Medications: fluoroquinolone(ciprofloxacin 500mg x2) or ceftriaxone drug of choice, fluoroquinolone or amoxicillin for carriers; alternatives include chloramphenicol(500 mg x4), ampicillin(750mg x4), amoxicillin. Treatment for 14 days.

Surgery: cholecystectomy may be necessary for chronic carriers

#### Prevention:

- Chlorination or boiling of water supply, public health measures
- Milk should be pasteurized.
- Food should be protected from flies.
- typhoid vaccine recommended for travelers going outside usual tourist routes in countries where typhoid endemic (some areas of Latin America + Asia) or any area where outbreak is occurring
- Injectable Vi vaccine as single dose which protect for 3 years. & oral attenuated live vaccine gives protection for 1 year (Vivotif)

#### *Control:*

- Sanitary disposal of excreta.

- Permanent method of purification of water.
- Raising the standards of personal hygiene.
- Trace the source by phage-typing and serological tests for the presence of Vi antibody in any outbreak of typhoid fever.
- For cases CEFTRIAXONE, chloramphenicol 2gm daily for 14days
- Patient remains in hospital (following treatment) until stools and urine are bacteriologically negative on three occasions at intervals 48hours.
- For chronic carriers; cholecystectomy in patients whom the gallbladder is the site of infection.
- Also prolonged administration of ampicillin 4gm daily for 1-3months shows good results