

GOOD MORNING



Typhoid Fever (Enteric Fever)



ETIOLOGY

Typhoid fever is mainly caused by *Salmonella Typhi* (also called *Salmonella enterica serovar Typhi*). Less commonly it is caused by *Salmonella Paratyphi* (A, B, & C) which cause similar but less severe disease.

EPIDEMIOLOGY

Typhoid fever is endemic in developing countries, especially Asia. *S. Typhi* is highly adapted to infect human beings; transmission occurs after (direct or indirect) contact with infected person (sick or chronic carrier) through ingestion of contaminated foods or water, which cause similar but less severe disease

PATHOGENESIS

After ingestion, *S. Typhi* invade the gut mucosa through "M cells" in the terminal ileum to the mesenteric lymphoid system, then to blood stream via the lymphatics. This primary bacteremia is usually asymptomatic, and blood cultures are frequently negative at this stage. Bacteria then disseminated throughout the body and colonize organs of the reticulo-endothelial system, where they may replicate within macrophages, then shed back to blood, causing secondary bacteremia which coincides with the onset of clinical symptoms.

In addition to enteritis, *S. Typhi* can cause inflammation, ulceration or perforation of the Peyer patches of terminal ileum, but more commonly they heal without scar or stricture formation. **Predisposition to infection is depend on many factors including:** surface Vi (virulence) polysaccharide capsular antigen found in *S. Typhi* (which interferes with phagocytosis) dose of inoculums, state of immunity & nutrition, HLA of the host as well as infection .with *H. pylori*

CLINICAL FEATURES

I.P. is usually 1-2 wk; the manifestations are usually not specific. Hx. High-grade fever, malaise, generalized myalgia, anorexia, headache, vomiting, abdominal pain, and dry cough. In children, diarrhea may be present in the earlier stages of the illness which may be followed by constipation. Ex. Pyrexia (rarely associated with relative bradycardia), pallor, toxicity, HSM, coated tongue, & Rose spots (macular or .(maculopapular rash on the trunk

COMPLICATIONS

Fortunately rarely occur with good Rx. It include:-

1. GIT; intestinal hemorrhage or perforation (with features of peritonitis), hepatitis (with jaundice), & .cholecystitis

Neurologic; delirium, psychosis, \uparrow ICP, acute.2 cerebellar ataxia, chorea, deafness, & .Guillain-Barre syndrome

,Others; fatal BM necrosis, DIC, HUS .3

nephrotic syndrome, pyelonephritis, meningitis, endocarditis, parotitis, orchitis, & suppurative .lymphadenitis

DIAGNOSIS ;The Dx of typhoid fever is still clinical in the .developing countries

CBP; usually there is leukopenia (although leucocytosis.**1** may occur in young children);thrombocytopenia may be a .marker of severe disease

Serology; The classic Widal test measures antibodies.**2** against O and H antigens of S. Typhi but it lacks sensitivity and specificity in the endemic areas. Therefore, now it has been replaced with Monoclonal Antibodies that directly detect S. Typhi–specific antigens in serum or S. Typhi Vi .antigen in urine



Culture is the gold standard for Dx. Stool **.3** culture may be +ve during the I.P., then also become +ve after the 1st wk of illness (as well as the urine culture). Blood culture is +ve in only \approx .half of patients during early stage of disease

.PCR .4



;DIFFERENTIAL DIAGNOSIS

acute bronchitis, and bronchopneumonia.

Subsequently, malaria; sepsis with other bacterial
, pathogens; tuberculosis

brucellosis, tularemia, leptospirosis, and rickettsial
diseases; and viral infections such as Dengue fever,
acute hepatitis, and infectious
.mononucleosis, gastroenteritis



TREATMENT

Mild cases can be managed as outpatient, but severe cases* or those associated with Cxs should be admitted to hospital for adequate rest, hydration, nutrition (with a bland diet), & .antipyretics e.g. acetaminophen every 4–6 hr

Antibiotic therapy include: high dose Amoxicillin 75-100* mg/kg/day or Chloramphenicol 50-75 mg/kg/day, both for 2-3 wk (unless the organisms are resistant), or fluoroquinolone e.g. Ciprofloxacin 15 mg/kg/day for only 5-7 days. Alternative agents include: 3rd generation cephalosporins e.g. Ceftriaxone or Cefixime for 1-2 wk; or Azithromycin .for 1 wk



Dexamethasone can be given for severely ill* patients, but must be done under strict supervision because it may mask the signs of .abdominal Cxs

initial dose is 3 mg/kg then 1 mg/kg every 6 hr .for 2 days

Note: This dose is higher than that used in .meningitis



PROGNOSIS

generally uncomplicated disease is usually resolves within 2-4 wk. However, even with antibiotic Rx, relapse may occur due to the emergence of multidrug-resistant strains of *S. Typhi*, especially to amoxicillin, chloramphenicol, TMP-SMZ as well as fluoroquinolones. Individuals who excrete *S. Typhi* for ≥ 3 mo after infection are regarded as chronic carriers, but the risk increases with age, thus it is low in children. Children with Schistosomiasis can develop urinary carrier state .because *S. Typhi* can infect the parasite itself

PREVENTIOIN

Improve sanitation by handwashing & prevention of food contamination, chlorination of water, screening of food handlers, & tracing ;of chronic carrier. There are 2 vaccines

Oral live-attenuated & IM

.Vi capsular polysaccharide vaccines



THANKS

