15.17D: Typhoid Fever

LEARNING OBJECTIVES

- Summarize the four stages of untreated typhoid fever and methods of preventing it

Typhoid fever, also known as typhoid, is a common, worldwide bacterial disease. It is transmitted by the ingestion of food or water that has been contaminated with the feces of a person infected by the bacterium Salmonella typhi, serotype Typhi. The disease has been known by many names, such as gastric fever, abdominal typhus, infantile remittant fever, slow fever, nervous fever or pythogenic (originating from filth or putrefaction) fever. The name “typhoid” means “resembling typhus” and comes from the neuropsychiatric symptoms common to typhoid and typhus. The term “enteric fever” is a collective term that refers to typhoid and paratyphoid. The impact of this disease fell sharply with the improved sanitation techniques of the 20th century.

STAGES

Classically, the course of untreated typhoid fever is divided into four individual stages, each lasting approximately one week.

First stage: the temperature rises slowly and fever fluctuations are seen with relative bradycardia (slow pulse), malaise, headache and cough. Nose bleeds (epistaxis) are seen in 25% of cases and abdominal pain can occur. There is leukopenia (a decrease in the number of circulating white blood cells), with eosinopenia and relative lymphocytosis. The classic Widal test is negative in the first week.

Second stage: the patient lies prostrate with high fever in plateau around 40 °C (104 °F) and bradycardia, classically with a dicrotic pulse wave. Delirium is frequent; patients may be calm, but sometimes agitated. This delirium gives
Typhoid Fever: Rose spots on the chest of a patient with typhoid fever due to the bacterium Salmonella typhi

Third stage: a number of complications can occur: intestinal hemorrhage due to bleeding in congested Peyer’s patches and intestinal perforation in the distal ileum.

Fourth stage: by the end of the third week the fever starts subsiding (defervescence). This carries on into the fourth and final week.

PREVENTION

The bacteria which cause typhoid fever may be spread through poor hygiene habits and public sanitation conditions and, sometimes, also by flying insects feeding on infected feces. Public education campaigns encouraging people to wash their hands after defecating and before handling food are an important component in controlling the spread of the disease. A person may become an asymptomatic carrier of typhoid fever, suffering no symptoms, but capable of infecting others.

DIAGNOSIS

Diagnosis is made by any blood, bone marrow or stool cultures and with the Widal test (demonstration of salmonella antibodies against antigens O-somatic and H-flagellar). In epidemics and less wealthy countries, after excluding malaria, dysentery or pneumonia, a therapeutic trial time with chloramphenicol is generally undertaken while awaiting the results of the Widal test, and cultures of the blood and stool. The Widal test is time-consuming and often, when a diagnosis is reached, it is too late to start an antibiotic regimen.
VACCINATION

There are two vaccines licensed for use for the prevention of typhoid: the live, oral Ty21a vaccine (sold as Vivotif Berna) and the injectable Typhoid polysaccharide vaccine (sold as Typhim Vi by Sanofi Pasteur and Typherix by GlaxoSmithKline).

TREATMENT

The rediscovery of oral rehydration therapy in the 1960s provided a simple way to prevent many of the deaths of diarrheal diseases in general. Where resistance is uncommon, the treatment of choice is a fluoroquinolone such as ciprofloxacin otherwise, a third-generation cephalosporin such as ceftriaxone or cefotaxime. Cefixime is a suitable oral alternative. Typhoid fever in most cases is not fatal. Antibiotics, such as ampicillin, chloramphenicol, trimethoprim-sulfamethoxazole, amoxicillin and ciprofloxacin have been commonly used to treat typhoid fever.

Key Points

• The impact of Typhoid fever fell sharply with the improved sanitation techniques of the 20th century.
• Classically, the course of untreated typhoid fever is divided into four individual stages, each lasting approximately one week.
• Diagnosis is made by any blood, bone marrow or stool cultures and with the Widal test (demonstration of salmonella antibodies against antigens O-somatic and H-flagellar).

Key Terms

• **dicrotic**: A type of pulse associated with low systemic vascular resistance and a compliant aorta, e.g sepsis
• **Peyer’s patch**: Peyer’s patches (or aggregated lymphoid nodules) are usually found in the lowest portion of the small intestine, the ileum, in humans.
• **Widal test**: The agglutination test for typhoid fever.
• **eosinopenia**: Eosinopenia is a form of agranulocytosis where the number of eosinophil granulocyte is lower than expected; usually a predictor of bacterial infection.
• **lymphocytosis**: An increase in the number or proportion of lymphocytes in the blood.