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Enteric Fever-A Review of Diagnosis and Treatment

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ABSTRACT:

Enteric fever infects the payers patches of small intestine and then eventually spreads to the blood stream through the lymphatic vessels. Patients of typhoid fever have high grade continuous fever, with diarrhea or constipation, abdominal pain,. Untreated typhoid fever can cause intestinal perforation, encephalopathy and various systemic complications. Enteric fever is diagnosed based on clinical symptoms and certain investigations such as typhidot and blood culture. Blood culture is investigation of choice whereas typhidot only suggests the enteric fever but not confirms it. Apart from supportive management, antibiotics therapy is the mainstay of treatment of enteric fever.

PATHOPHYSIOLOGY:

Typhoid fever also known as enteric fever is caused by Salmonella Typhi and Salmonella Paratyphi, both of which are Gram-Negative bacteria.[5] The pathophysiology of S.Typhi begins by infecting and multiplying in phagocytic cells following which these organisms are released into blood. S. Typhi penetrates the mucosa through enterocytes and reach lamina propria. This leads to an inflammatory response and macrophages reach that area. These macrophages ingest the bacteria and reside within the macrophages of small intestine. Some of them reach the blood stream by passing through the mesenteric lymph nodes and then entering the thoracic duct. This bacteraemia leads to inoculation of all the organs of reticulo-endothelial system by this pathogen where it resides for 8-14 days, a period known as incubation period.[1]

TRANSMISSION :

The natural host of typhoid are humans. S.Typhi spreads through feco-oral route. The most common mode of spread is by ingesting food or drinks contaminated with feces of the patient or carrier. The outbreak of typhoid can occur in cases where water supplies to a large population are contaminated. One other common mode of spread is the poor food hygiene and handling of food by carriers of S.typhi.

SIGNS and SYMPTOMS:

Multiple factors determine the severity and clinical outcome of the disease. These include time period between initiation of illness and antibiotic therapy, the type of antibiotic used and its effectiveness, vaccination history and previous exposure, the inoculums quantity and certain host factors(immune-compromised hosts, those on Antacid therapy are at increased risk of severe outcomes).[2]

In non complicated cases, there is step ladder pattern fever with relative bradycardia , abdominal pain, loose stools in children whereas constipation in adults, headache, malaise and anorexia. Cough is seen in early stages of the illness whereas some patients exhibit rashes on abdomen, chest and back. In case of advanced disease, the intestine may perforate. Intestinal perforation presents with tachycardia, hypotension, abdominal tenderness, guarding, leukocytosis and free air under diaphragm. Some patients may present with altered mental status or in severe cases with coma. Some of the less common conditions associated with typhoid fever include hepatitis, DIC myocarditis, pneumonia And HUS. Only 3-4 % patients become carriers, in which Salmonella Typhi becomes harboured in the gall bladder.

DIAGNOSIS:

Enteric fever is diagnosed on the basis of clinical signs and symptoms couple with isolation of organism in body fluids or some anatomical location. The definitive diagnosis of enteric fever lies with the blood culture. Signs and symptoms as well as the antibodies only suggest the disease but do not give definitive diagnosis.

The blood culture medium most commomnly used is ox bile medium. However, in certain cases, the organism may not be isolated due to various reasons which include the presence of antibiotics, suboptimal quantity of the specimen, the timing of taking the blood samples. Bone marrow aspirate culture is the gold standard investigation for diagnosing typhoid fever but is not routinely used. Gastric or duodenal aspirate culture is also useful in diagnosis but is less tolerated in children.

Typhidot test detects IgM and IgG antibodies against S.Typhi. Typhidot is speedy, simple to perform, highly sensitive and specific. It offers high PPV as well as NPV. If IgM is detected it shows early stages of acute typhoid fever where as presence of IgM and IgG both suggests the middle

phase of the disease. IgG can persist for more than two years after acute typhoid fever, the presence of IgG cannot differentiate between acute and convalescent typhoid fever. In order to increase diagnostic accuracy , the original tyhpidot test was modified into a modified test by inactivating igG and allowing reagent to bind IgM more effectively.[4]

TREATMENT OF TYPHOID:

Supportive management of typhoid includes oral and IV hydration, antipyretic, antiemetic , nutritional support. Those patients who have severe diarrhea , vomiting or abdominal distention may require hospitalization. The main stay of treatment of enteric fever is antibiotics however.

The fluoroquinolones are optimal first line antibiotics for uncomplicated typhoid fever. They have excellent tissue penetration and achieve adequate levels in gall bladder, cost effective and clear the symptoms and fever in 3-4 days[2]. They have lower rates of post treatment carrier state. However in the recent times, two type of drug resistant typhoid pathogens have emerged namely multidrug resistant (MDR) Strains and Nalidixic acid resistant salmonella tyhpi (NARST). MDR strains are resistant to chloramphenicol, ampicillin and TMP-SMZ. Whereas NARST are resistant to flurouinolones.

Antibiotics commonly used in treatment of uncomplicated typhoid fever are

- Fully sensitive strains: Flurouinolones (ciprofloxacin at 15mg/kg/day)
- MDR Strains: Cephalosporins such as Cefixime at 20 mg/kg/day
- NARST Strains: Azithromycin at 10 mg/kg/day

  If IV antibiotics are needed ceftriaone at 75 mg/kg/day. Cefotaxime or cefoperazone may be given.

Any patient who is asymptomatic but has positive stool or rectal swab cultures for S.Typhi a year after recovery from acute illness is considered carrier of the disease . An individual is at higher risk of becoming carrier in case of females, gall stones and schistosomiasis. In these cases, cholecystectomy or antiparasitic treatment is required in addition to antibiotics. Ciprofloxacin at 750mg twice daily for 28 days is used for carriers of typhoid.

Typhoid can be prevented with the health education regarding hand washing practices, by provision of safe and clean drinking water and food and by improving sanitation.

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