ENTERIC FEVER

LECTURE
BY
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DEFINITION

- Severe systemic disease
- Caused by salmonella ser typhi
- Characterized by
  - Prolonge febrile illness
  - Abdominal pain, diarrhea
  - Delirium
  - Rose spot
  - Splenomegally
ETIOLOGY

- Salmonella typhi
- Salmonella paratyphi a
- Paratyphi b (schottmuelleri)
- Paratyphi c (hirschfeldii)
- Others
● Gram negative bacilli
● Resistant to drying & cooling
● Survive in sewage, fecal material & dried food
● Three types of antigens
  – Somatic (o)
  – Flagellar (h)
  – CAPSULAR (vi)
INCIDENCE

- 500/100,000 cases
- 12.5 cases annually worldwide
EPIDEMIOLOGY

- All ages & both sexes
- Fecal-oral transmission
- Natural reservoir
- Major reservoirs
  - Poultry, pets
  - Contaminated water
  - Infected fruits & vegetables
  - Infected humans
- Transplacental
- Intra partum
INCUBATION PERIOD

- 7-14 days
- Size of ingested inoculum
  - $10^5 - 10^9$
- Immune status of host
  - Cell mediated immunity
PATHOGENESIS

- Hyperplasia of peyers patches
  - Necrosis & ulcer formation
- Hyperemia and focal necrosis of mesenteric lymph nodes
- Liver, spleen & bone marrow.
- Multiplication in walls of gallblader
VIRULENCE FACTORS

- Stomach acidity
- Gene encoded the invasion of peyer patches
- Organisms survive within the macrophage
- Circulating endotoxin
- Cytokine production
- Cell mediated immunity
CLINICAL FEATURES

- Transplacental transmission
  - Abortion
  - Premature delivery
- In neonates
  - Vomiting, diarrhea & abdominal distention
  - Hepatomegally
  - Jaundice, anorexia & wt loss
  - Fever, fits
INFANTS & YOUNG CHILDREN

- Relatively rare
- Mild – severe disease
- Gastroentritis
- Febrile fits
- Jaundice & hepatosplenomegaly
CHILDREN & ADOLESCENTS

● FIRST WEEK
  – Gradually increasing persistent fever
  – Headache
  – Abdominal pain
  – Diarrhea
  – Lethargy, anorexia
SECOND WEEK

- Sustained high fever
- Acutely ill, disoriented
- Relative bradycardia
- Distented, diffusely tender abdomen
- Hepatosplenomegaly
- Rose spots
- Focal infection
CONTINUED...

- THIRD WEEK
  - Nausea, vomiting.....Complication
  - Intestinal bleeding
  - Signs of perforation
  - Shock
  - Coma
FORTH WEEK & LATER
- Restoration of symptoms
- Relapse
- Emaciation
- Malaise
- Lethargy
CARRIER STATE

- asymptomatic excretion of organisms for more than one year
DIAGNOSIS

- ISOLATION OF SALMONELLA
  - Blood culture (40-60%)
  - Stool & urine culture
  - Bone marrow culture (85-90%)
SEROLOGICAL TESTS

- WIDAL TEST
  - After 10 days
  - Antibody response to somatic “O”
    & Flagellar “H” antigens
  - 1:160 ….Suggestive
  - Rising titre
TYPHIDOT TEST

- More rapid test
- Detected within 1\textsuperscript{st} week
- Ig\textsubscript{m} antibodies......Acute typhoid fever
- Ig\textsubscript{m} & Ig\textsubscript{g} antibodies...acute infection in middle stage
- Ig\textsubscript{g} antibodies........Previous infection
POLYMERASE CHAIN REACTION

- Quick detection
- Amplify specific genes of s. Typhi in blood
- More specific & sensitive
SUPPORTIVE INVESTIGATION

- COMPLETE BLOOD PICTURE
  - Normochromic, normocytic anemia
  - Relative leukopenia
  - Leukocytosis
  - Thrombocytopenia
OTHERS

- Liver function test
- Proteinuria
- Fecal leukocytes & blood
DIFFERENTIAL DIAGNOSIS

- Gastroenteritis
- Viral illness
- Bronchopneumonia
- Tuberculosis
- Anicteric hepatitis
- Leukemia. Lymphoma
COMPLICATIONS

- INTESTINAL PERFORATION 0.5-3%
  - Distal ileum
  - Increased abdominal pain, tenderness, vomiting & peritonitis
GIT

- Intestinal hemorrhage 1-10%
  - Increase pulse rate
  - Drop in temperature & blood pressure
- Overt hepatitis
- Cholecystitis
NEUROLOGICAL COMPLICATION

- Meningitis
- Toxic encephalopathy
  - Increased intracranial pressure
  - Cerebral thrombosis
  - Acute cerebellar ataxia
  - Chorea
  - Aphasia
  - Deafness
  - Transverse myelitis
  - Psychosis
TOXIC MYOCARDITIS

- FATTY INFILTRATION & NECROSIS
  - Arrhythmias
  - Sinoatrial block
  - St-t changes
  - Cardiogenic shock
OTHERS

- Pneumonia
- Fatal bone marrow necrosis
- Endocarditis
- Pyelonephritis
- Osteomyelitis
- Septic arthritis
SPECIFIC TREATMENT

- 1st line antibiotic
  - Ampicillin
  - Amoxicillin
  - Tmp-smx
  - Chloramphenicol
- Resistance upto 49-83%
- 14 days treatment
2\textsuperscript{ND} LINE ANTIBIOTIC

- Third generation cephalosporin
  - Ceftrixone
  - Cefotaxime
  - Oral cefixime

- Fluoroquinolone
  - Ofloxacin

- Ciprofloxacin
SUPPORTIVE TREATMENT

- Fluid and electrolyte balance
- Nutritional support
- Blood transfusion
- Platelet transfusion
- Surgical intervention
- Short course of dexamethasone
  - Shock, obtundation, stupor or coma
TREATMENT FOR CARRIER

- High dose of amoxicillin plus probenecid
  - 4-6 week
- Ciprofloxacin
- Cholecystectomy
PROGNOSIS

- Prompt therapy
- Age of patient
- Previous state of health
- Salmonella serotype
- Complication
- Mortality upto 10%
- Relapse ..... 4-8%
PREVENTION

● Improved sanitation & clean water
● Personal hygiene
  – Hand washing
  – Food preparation practices
● Eradicate carrier state
VACCINES

● Oral live attenuated ty21 a strain
  – Four enteric coated capsules on alternate day
  – Recommended for > 6yrs

● Vi capsular polysaccharide
  – Intramuscular
  – >2 yrs
  – Booster every two yrs
- No vaccine can provide 100% coverage
- Personal hygiene is must
Thankyou