

# SHIGELLAS

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*Shigellas and Salmonellas* are the most important enteric pathogens in the family *enterobacteraceae*

- Gram negative glucose fermenters
- Lactose non-fermenters
- Non motile (Salmonella are motile)
- Acid Producers but non gas producers
- Carrier state is rare
- They usually do not cause Bacteraemia
- Strict human pathogens

The genus *Shigella* is divided bio-chemically and serologically into:

1) *Shigella dysenteriae* (13 serotypes)

Type (1) called *Shigella shiga*. The most

- Important, it causes the severest type of disease
- Common in under developed countries.

2) *Shigella boydii* (15 serotypes)

2<sup>nd</sup> in severity to *Shigella dysenteriae*

3) *Shigella flexneri* (6 serotypes)

- Some members produce gas
- Less severe disease than *Shigella boydii*

4) *Shigella sonnie* (One serotypes)

- Causes the mildest disease
- More common in developed countries


# Pathogenesis

- Strictly human pathogen
- Acquired directly or indirectly from a human case rarely a carrier.
- Faecal-oral route
- Infective dose ( $10^1$ - $10^2$ ) compared to:
  - $10^2 - 10^3$  for *S.typhi*
  - $10^6 - 10^8$  for other *Salmonellas*
- The lipopolysaccharide coat protect them from the gastric acidity.

# Pathogenesis (Continued)

- Invasion by action of outer membrane proteins
- They produce an exotoxin (similar to that of *E.coli*)
  - a) It has a Cytolytic effect → kills cells
  - b) Enterotoxic effect → secretion of H<sub>2</sub>O, electrolytes.
  - c) Neurotoxic effect → affect nerves (**pain**)

# Clinical Features

- Incubation period 2-4 day may be <12 hours
- Colicky pain (**Tenesmus**)
- Frequent watery diarrhoea
- Followed by frequent passing of small amount of bloody stools and abdominal pain (Tenesmus)
- 4 days  10 days

# Clinical Features (Continued)

- *Shigella dysenteriae* can cause bacteraemia with high temperature.
- *Shigella dysenteriae* can also cause Hemolytic uraemic syndrome (HUS)
  - Haemolytic anaemia
  - Thrombocytopenia
  - Acute renal failure with Uraemia



# Diagnosis

A- Clinical

B- Laboratory

1- Culture

Specimens

a- Stool

b- rectal swab

Media – XLD (Xylose lactose deoxycholate)

- XLD ( Red colonies)
- Hektoen (Green colonies)

# Diagnosis (Continued)

Identification:

A- Bio-chemical tests (API)

B- Kligler's iron agar Or Triple sugar medium

- Alkaine slant
- Acid butt
- No gas production

C- Serological Tests

- To serotypes these isolates for epidemiological purpose.

# Treatment

- Correct dehydration
- *Shigella sonnei* infection: usually self-limiting. No antibiotics needed.
- All others need antimicrobial therapy
- Use non-absorbable antimicrobial agents
- Orally

## Examples

- a) Ampicillin
- b) Cotrimoxazole

# Treatment (Continued)

Resistant strains:

- a) Nalidixic acid
- b) Ciprofloxacin
- c) Ceftriaxone (injectable)

# Epidemiology (Continued)

## Sources:

- From cases but rarely carriers
- Faecal-oral route
- Contaminated fingers of cases or carriers to:
  - Toilets
  - Door handles

} **To other patients**
- By house flies and other insects.