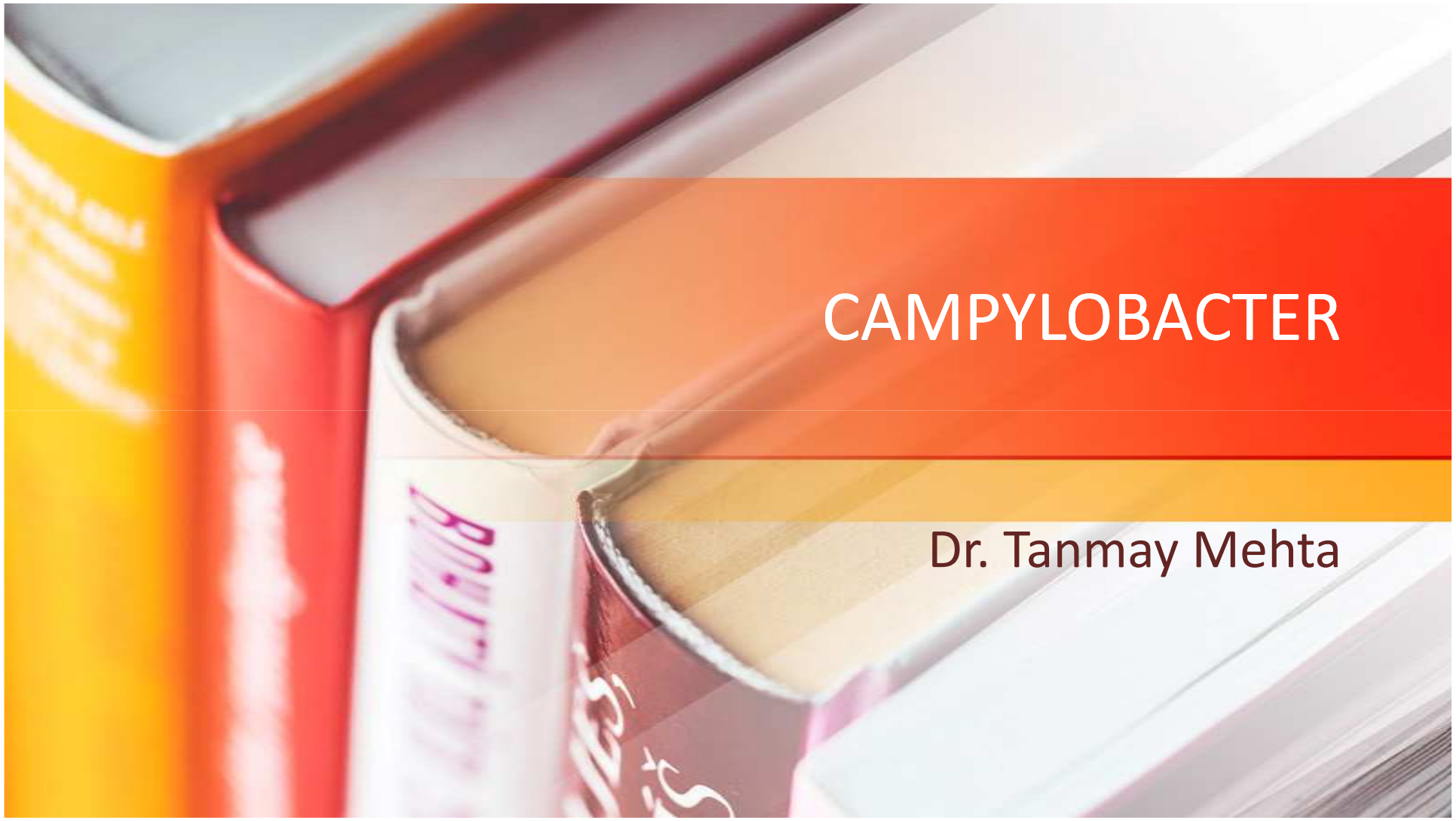


CAMPYLOBACTER

Dr. Tanmay Mehta

Learning objectives

At the end of the session, the students will be able to

- Describe morphology and antigens
- Describe Pathogenesis & Clinical features
- Choose appropriate lab diagnosis and interpret the results
- Describe prevention and treatment

CAMPYLOBACTER

- Curved gram-negative rods
- Motile, nonsporing, microaerophilic
- Cause both diarrheal and systemic diseases.
- Primarily diarrheal disease- *C. jejuni (*80–90%*) & others – C. coli, C. upsaliensis, C. lari, C.hyointestinalis, C. fetus*
- Extraintestinal infection - *C. fetus.*

Epidemiology

- **Source: *zoonotic***
- Found in intestine of poultry, cattle, sheep, swine and household pets
- **Mode of transmission**
- Raw or undercooked food products: poultry (most common), raw milk or untreated water
- Direct contact with the infected household pets
- **Age:** All ages, *C. jejuni* - common among children
- *C. fetus* - extremes of age

Epidemiology

- **Developing countries** - *C. jejuni* hyperendemic, mostly asymptomatic infection, children <2 yrs usually symptomatic
- Developed countries - L*eading* bacterial cause of diarrheal disease
- **Seasonality:** peaks during summer and early autumn

Pathogenesis

❑ **Virulence factors:**

- **Motility** - single polar flagellum
- **Adhesion** to host tissues
- **Toxins** play a minor role:

- Enterotoxin (Heat-labile, similar to cholera toxin)
- Cytotoxins (cytolethal distending toxin, or CDT).

- **Proteinaceous capsule-like structure** (S-layer) expressed by *C. fetus:* Protection from complement mediated killing and opsonisation

Clinical Manifestations

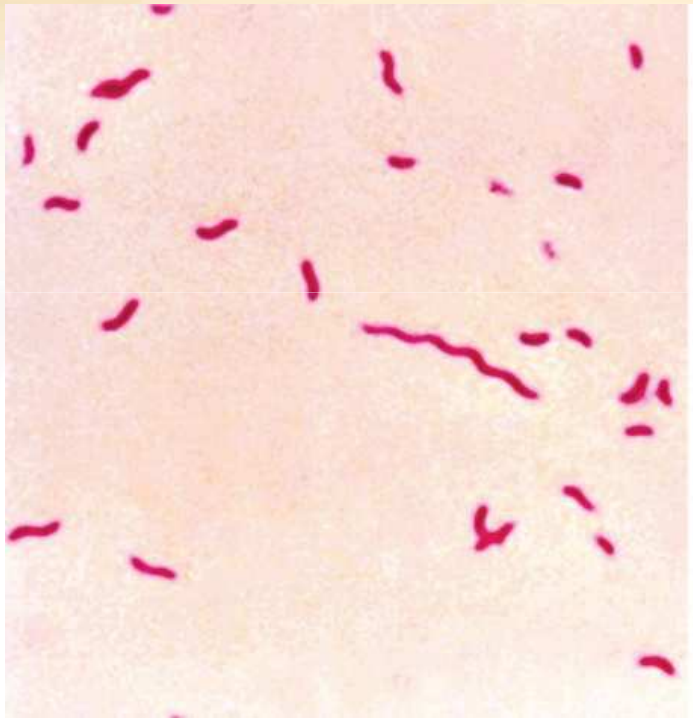
- **Intestinal infection:**
- **Inflammatory** diarrhea, abdominal pain and fever
- Self-limiting with relapses in 5–10% of untreated cases
- **Extraintestinal infection: mainly due to *C. fetus***
- Mostly in immunocompromised hosts
- Extremes of age.
- Common manifestations - bacteremia, sepsis, meningitis, vascular infections (endocarditis, aneurysm, &thrombophlebitis)

Clinical Manifestations

- **In persons with the HLA-B27 phenotype:**
- **Reactive arthritis** and other rheumatologic manifestations
- **Campylobacter triggers the pathogenesis of**
- Guillain–Barré syndrome (mainly by *C.jejuni* serotype O19)
- Alpha chain disease - lymphoma of small intestinal mucosa-associated lymphoid tissue

Laboratory Diagnosis

- **Direct Microscopy**
- Gram-staining - curved gram negative bacilli, comma/ *S-shaped or spiral (gull wingshaped)*
- Dark ground microscopy – darting motility



Culture

- **Transport medium:**

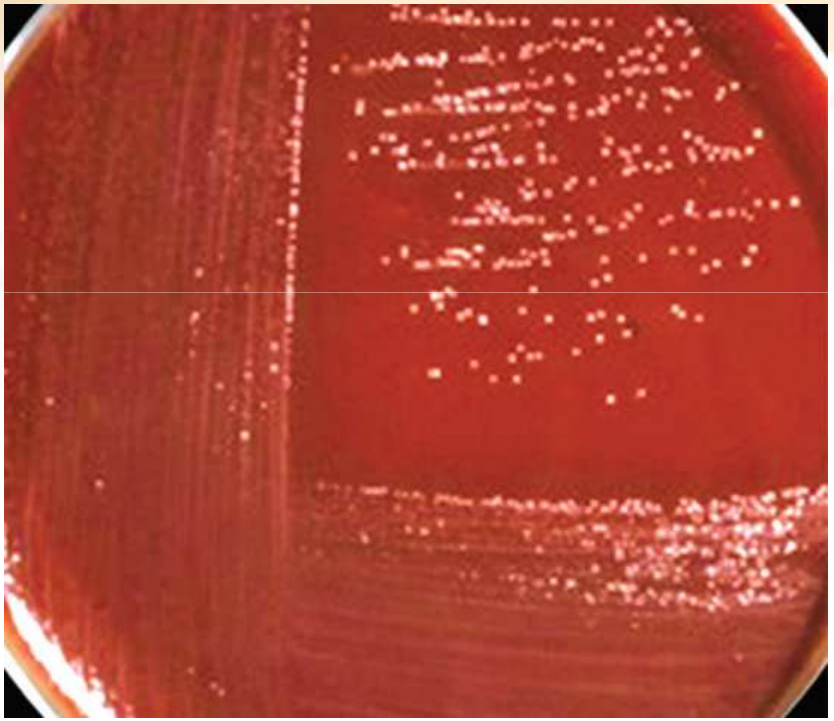
- Cary-Blair medium

- **Selective media:** Feces or rectal swabs are plated onto

- Skirrow's selective medium

- Butzler's selective medium

- Campy BAP medium



CULTURE

- **Culture conditions:**

- Microaerophilic condition (5% O2,10% CO2 and 85% nitrogen)

- **Growth at 42°C (**Thermophilic) - *C. jejuni, C. coli and C. lari*

- Nonthermophilic - *C. fetus*

- Effuse droplet-like colonies

Biochemical Identification

- Oxidase positive, catalase positive
- Nitrate reducers & do not ferment sugars
- *C. jejuni* has two subspecies*: jejuni* and *doylei. S*ubspecies *jejuni* is identified by -

- Nitrate positive
- Hippurate hydrolysis positive
- Growth at 42°C

- *C. upsaliensis* is catalase negative
- *C. hyointestinalis* is H2S positive

Treatment

- **Fluid and electrolyte replacement**
- **Antibiotics:**
- **Diarrheal disease:** Oral macrolides (erythromycin or azithromycin) DOC. Ciprofloxacin – alternative for adults
- **Systemic infection:** Parenteral gentamicin (or imipenem or chloramphenicol) should be started empirically – Correct antibiotic chosen based on Susceptibility testing