

Gi

Microbiology

summary (1+2)

يا حَيِّ يا قَيُّومُ بِرَحْمَتِكَ
أَسْتَغِيثُ، أَصْلَحْ لِي شَأْنِي كُلَّهُ
وَلَا تَكِلْنِي إِلَى نَفْسِي طَرْفَةَ عَيْنٍ

الملف فيه أهم النقاط المذكورة لكل بكتيريا .
الملف الأصلي كنت كاتبتة بخط الايد بس للوضوح حولته لنص
باستخدام (Ai) يعني ممكن يختلف شوي عن الترتيب الأصلي بس راح
يفيدكم بالدراسة إن شاء الله ، خاصة انه الدكتور بركز عالشغلات يلي
بتميز كل بكتيريا .

صلوا على النبي وبلشوا 💜

زينة ياسين

Vibrios

◆ General Features:

- Motile, oxidase +ve (\neq Enterobacteriaceae).
- G–ve, comma-shaped rods.
- Found in surface water.
- *V. cholerae* = halotolerant, others = halophilic.

◆ Types & Diseases:

1. *V. cholerae*

- O1, O139 → cholera.
- Non-O1/O139 → cholera-like gastroenteritis.
- Toxins: heat-labile (H antigen), O antigen.
- \uparrow cAMP → profuse watery diarrhea.
- Needs large dose to infect.
- Stool: “rice water”, mucus, no blood.
- Epidemics: clinical diagnosis enough.
- Sporadic: need lab confirmation.

2. *V. parahaemolyticus* → seafood poisoning.

3. *V. vulnificus* → sepsis (cirrhotics), wound infections.

4. *V. alginolyticus* → eye, ear, wound infections.

◆ Lab Diagnosis:

1. Sample: G–ve comma-shaped in stool.

2. Smear: dark-field → shooting star motility.

3. Culture:

- Grows fast (18h) on TCBS, peptone, blood agar (pH ~9).

4. Specific tests:

- Slide agglutination (O1/O139), biochemicals.

◆ Treatment:

1. Fluids

2. Antibiotics (if needed)

Campylobacter

◆ General Characteristics:

- Found in the GI tract of animals.
 - Causes diarrhea and can lead to systemic (extra-intestinal) disease.
 - *C. jejuni* and *C. coli* cause gastroenteritis in developed countries.
- ↳ May cause bloody diarrhea (inflammatory type).
- ↳ Usually seen in healthy individuals.
- *C. fetus* causes systemic infections in immunocompromised patients.

◆ Campylobacter jejuni:

Morphology & Physiology:

- Gull-wing shape under the microscope.
- Motile with darting motility.
- Microaerophilic: requires \uparrow CO₂ and \downarrow O₂.
- Thermophilic: grows best at 42°C.

◆ Diagnosis:

- Specimens: stool samples.
- Smear:
- Shows gull-wing shape.
- Observed under special conditions: microaerophilic and high temperature.
- Characteristic darting motility.

◆ Complications:

- Certain serotypes of *C. jejuni* and *C. coli* are linked to Guillain-Barré Syndrome (post-diarrheal).
- Local complications may include:
- Cholecystitis
- Pancreatitis
- Cystitis

◆ Treatment:

- Fluid replacement is the mainstay of therapy

Helicobacter pylori

◆ General Features:

- Spiral-shaped, multiple flagella
- Urease ↑↑, microaerophilic
- Oxidase & catalase positive

◆ Epidemiology:

- Colonizes $\frac{2}{3}$ of people in developing countries
- Fecal-oral / oral-oral transmission
- Humans are the only reservoir

◆ Diseases:

- Duodenal & gastric ulcers
- Gastric cancer & MALT lymphoma
- May cause iron deficiency via occult blood

◆ Pathogenesis:

- Lives in mucus layer near epithelium (neutral pH)
- Motile in mucus → reaches gastric pits
- Urease → ammonia → neutralizes acid & damages cells
- Mucinase → penetrates mucus
- Disease depends on:
 - Bacterial factors: cag, VacA, type IV system
 - Host: IL-1 gene polymorphisms
 - Environment: smoking

◆ Diagnosis:

- Smear
- Biopsy (stomach or duodenum)
- Difficult culture
- Special: CLO test, urea breath, stool Ag


◆ Treatment:

Triple: PPI + Metronidazole + Amoxicillin/Tetracycline

Quadruple: PPI + Metronidazole + Tetracycline + Bismuth

Brucellae

◆ General Features:

- G–ve coccobacilli, aerobic.  B. abortus requires $\uparrow\text{CO}_2$.
- Non-motile, slow-growing, oxidase & catalase positive.
- Facultative intracellular \rightarrow RES (e.g., liver, spleen, marrow).
- Zoonotic (livestock, unpasteurized dairy).
- Transmitted via inhalation \rightarrow potential biological weapon.

◆ Species & Diseases:

1. B. melitensis (goats/sheep) \rightarrow most severe.
 2. B. abortus (cattle) / 3. B. suis (pigs) / 4. B. canis (dogs)
- Cause brucellosis (Malta/undulant fever).
 - Fever \uparrow afternoon, \downarrow night.
 - Progression: entry \rightarrow lymph nodes \rightarrow thoracic duct \rightarrow blood \rightarrow RES.
 - Form granulomas \rightarrow may become abscesses.
 - Intracellular in RES (liver, spleen, marrow).

◆ Transmission: • Direct contact.

- Ingestion of unpasteurized dairy. • Inhalation (lab risk).

◆ Lab Diagnosis:

1. Culture: blood, bone marrow.
 - Uses Brucella agar (highly enriched; reduced form used for anaerobes).
2. Serology:
 - Standard agglutination test (SAT)
 - ELISA (uses cytoplasmic proteins; \uparrow sensitivity/specificity)
3. PCR (in specialized labs).

◆ Important Notes:

- Brucellosis patients can't donate blood.
- Live-attenuated Rev.1 vaccine used (for animals).

◆ Treatment:

- Doxycycline + Rifampin (6 weeks)
- TMP-SMX for children/pregnant.

Leptospira

◆ General Features:

- G⁻ve spirochete, thin, tightly coiled, double membrane.
- Motile (2 periplasmic flagella), non-capsulated.
- *L. interrogans* (pathogenic), *L. biflexa* (free-living).

◆ Disease: Leptospirosis

- 90% → mild/asymptomatic.
- <10% → Weil's Syndrome: hepatitis, nephritis, hemorrhage.
- Biphaseic:

1. Leptospiremic (1–2 wks): entry via skin/mucosa → spread in blood → no Abs → fever, myalgia, red eyes.

2. Immune: settles in liver/kidneys → hemorrhage, necrosis → Weil's (severe).

◆ Transmission:

- Water/soil (rat urine) → via abrasions, mucosa, ingestion, inhalation.
- Risk: sanitation workers, animal contact.

◆ Diagnosis:

1. Too thin for light microscopy.
2. Culture (slow).
3. MAT serology.
4. PCR (early).

◆ Treatment:

- Mild: doxycycline, ampicillin, or amoxicillin (oral).
- Severe: IV penicillin (targets PBPs).



بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

اللَّهُ لَا إِلَهَ إِلَّا هُوَ الْحَيُّ الْقَيُّومُ

لَا تَأْخُذُهُ سِنَةٌ وَلَا نَوْمٌ

لَهُ مَا فِي السَّمَوَاتِ وَمَا فِي الْأَرْضِ

مَنْ ذَا الَّذِي يَشْفَعُ عِنْدَهُ إِلَّا بِإِذْنِهِ

يَعْلَمُ مَا بَيْنَ أَيْدِيهِمْ وَمَا خَلْفَهُمْ

وَلَا يُحِيطُونَ بِشَيْءٍ مِنْ عِلْمِهِ إِلَّا بِمَا شَاءَ

وَسِعَ كُرْسِيُّهُ السَّمَوَاتِ وَالْأَرْضَ

وَلَا يَئُودُهُ حِفْظُهُمَا وَهُوَ الْعَلِيُّ الْعَظِيمُ ﴿٢٥٦﴾