Cornyebacterium

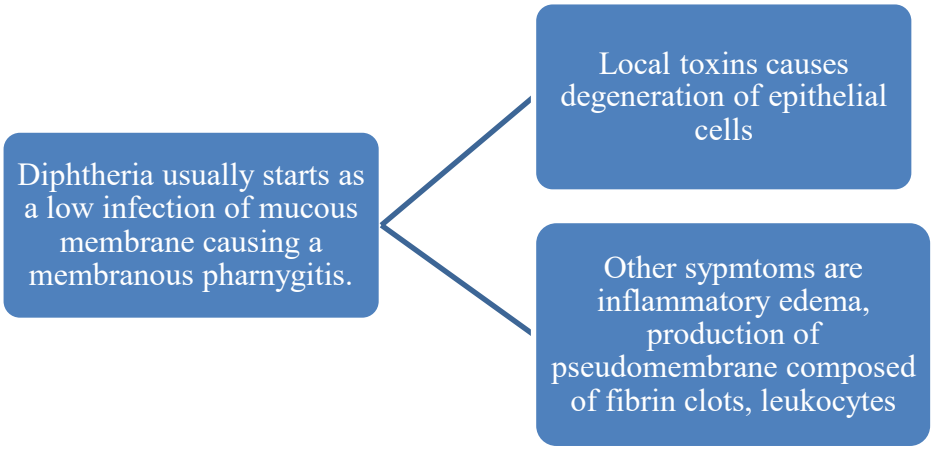
- 'Cornye' means club (club shaped swelling).
- It causes diphtheria.
  Fact : Diptheria bacilli described by klebs(1883).
  Cultivated by loeffler (1884).
- Also known as Klebs-Loeffler bacillus.

- Morphology:
  - Slender rod-clubbing at one or both ends.
  - Pleomorphic
  - Metachromatic granules seen.
  - Arrangement of bacillus:
    - Pairs, palisade, V or L shape.
    - Chinese letter pattern
    - Cruciform arrangement
  - Staining done with Loffler's methylene blue show bluish purple metachromatic granules.
  - Special stains for demonstrating granules:
    - Albert's stain
    - Neisse's stain
    - Ponder's stain

- Cultural characteristics:
  - Loffler's agar slant contains serum and egg that enhance the formation of meatchromatic granules in C.diptheria.
  - Also known as Bates-Ernst granules.

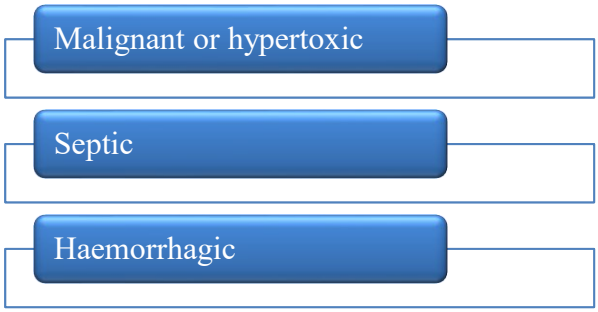
- Virulence factors:
  - For C.diptheria to cause diphtheria, an exotoxin must be induced.
  - Heat labile polypeptide produced during lysogeny of ß-phage that carries 'tox' gene.
  - Alkaline pH of 7.8 – 8.0, aerobic conditions and level of iron required for toxin production.
  - The toxin inhibits protein synthesis by ADP- ribosylating elongation factor- 2.

- Clinical significance:
  - Normally found in throats of healthy carriers.
  - Infects only man.



- Pathogenesis:
  - Most commonly seen in children o 2-10years.
  - Incubation period is 3 to 4 days.
  - Droplet spread
  - Raucial diphtheria is the common type.
  - Toxin has both local and systemic effects.
  - Systemic effects:
    - ✓ Affects the
      - heart- heart failure
      - Peripheral nerves- paralysis
      - Adrenal glands- hypofunction
    - ✓ Cutaneous diphtheria – necrotic lesions with occasional formation of a local pseudomembrane occur.

- Diptheria clinical classification:



- Epidemiology:
  - Formerly important paediatric disease.

- Rare in 1st year of life, peak between 2-5years, fall slowly between 5-10 years and rapidly between 10-15 years.

- Laboratory diagnosis:
  - Isolation of the organism.
  - Demonstration of its toxicity.

- Isolation:
  1. Collection of specimen – 2 swabs
     a) Smear examination
     b) Culture
  2. A source of light and tongue depressor are necessary for visualisation of post-pharyngeal wall.
  3. Swabs – rubbed over the pseudomembrane.

- Microscopy:
  - Blots
- Culture:
  - Loffler's serum
  - Tellurite blood agar
  - Blood agar
- Biochemical reaction:
  - Hiss's serum
- Subcutaneous test:
  - 0.8 ml of overnight broth culture ingested to 2 guinea pigs.
  - One of them is protected with 500 units of diphtheria autotoxin 18-24 hr prior.(control)
  - If the strain is virulent, the unprotected animal dies within 2-3 days with haemorrhage in adrenal gland (**pathagnomomic feature)**
- Intracutaneous test:
  - Two guinea pigs injected intracutaneously with 0.1ml emulsion,one animal is protected with 500 units of antitoxin given on the previous day.(control)
  - Test animals- 50 units antitoxin given intraperitonially 4 hrs after intracutaneous injection in order to prevent death.
  - If the strain is toxigenic – inflammatory necrosis at the site. If infection seen in test animals.
- Invitro test:
  - Elek's gel precipitation test.

- Treatment:
  - Penicillin – sensitive
  - Erythromycin – more active in treatment of carriers.
  - Antidiptheric serum should be given immediately – 20,000 units IM.
  - Severely ill cases – 50,000 to 1,00,000 units given.