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MENINGITIS

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- **Objectives (Learning outcomes)**

1- Identify the causative agent of meningitis

2- Recognize the different modes of transmission.

3- Differentiate between incubation period and communicability period.

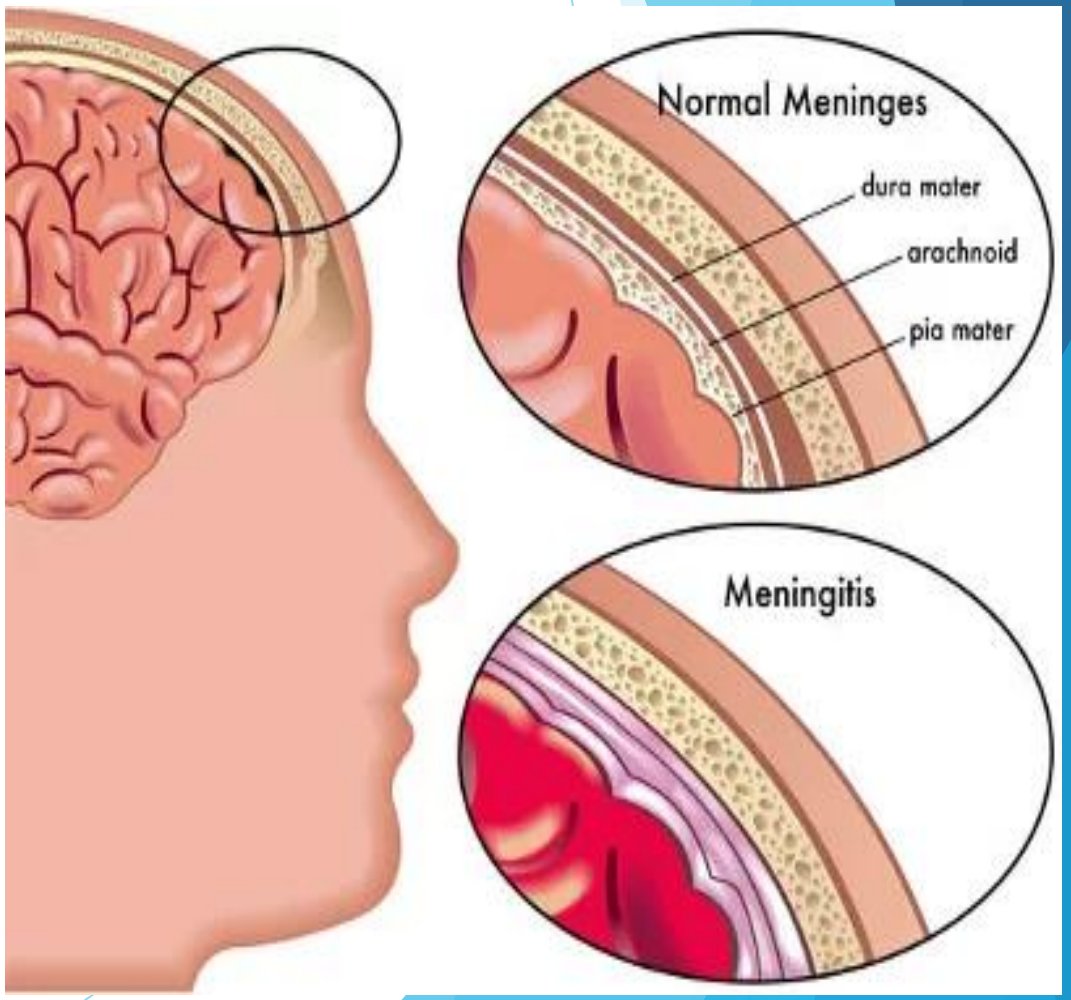
4- Identify the clinical picture of meningitis

5- Know how to diagnose meningitis

6- Illustrate prevention and control of meningitis

- **Definition:** Acute infectious disease characterized by inflammation of the brain-meninges and CNS manifestations.

- **Causative organism:**
- **1- Purulent- septic meningitis: Caused by**
- - Meningococcus: cerebrospinal fever.
- Streptococcus.
- Staphylococcus.
- Other pyogenic bacteria.



- **2. Aseptic: caused by**
- Viruses (as enteroviruses: coxakaie A & B, respiratory transmitted viruses as measles and mumps).
- Leptospirae.
- **3- Granulomatous: Caused by**
- T.B.
- Fungi.
- Syphilis ($).

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MENINGOCOCCAL MENINGNITIS

“Cerebrospinal fever”

- **Definition:** Acute pyogenic infections disease characterized by inflammation of the meninges of brain and spinal cord.
- **Causative agent:** Meningococcus, delicate diplococcus that dies rapidly outside the body.

- **Reservoir: (human only)**
  - Cases (don't cause frank illness among their contacts due to isolation of the severely ill patient and the organisms disappear soon from the nasopharynx after the start of treatment).
  - All types of Carriers (the most common source of infection): organism in nasopharyngeal discharge.

- **Exit:** nose and mouth.
- **Mode of transmission:**

1. Direct droplet infection: more common through contact with cases & carriers.
2. Droplet nuclei and articles are rare because the organism dies rapidly outside the body.

- **Inlet:** nose and mouth.
- **Incubation period:** 2-7 days.
- **Communicability :** as long as the meningeococci present in the discharge of the nose and mouth.
- Sporadic cases all over the year.
- Out breaks in closed communities.
- Seasonal variation:

▶ More common in late winter and early spring.

- **Predisposing factors:** Overcrowding and bad ventilation in closed communities and public places.
- **Susceptibility:** it is general. However, younger ages are more susceptible than older groups as their levels of antibodies are lower, infants drive passive immunity from mother. Acquired immunity could be gained through: subclinical infection (mostly) and clinical disease, or vaccination.

- Post infection immunity even after the subclinical attack is of unknown duration and second attack is rare.

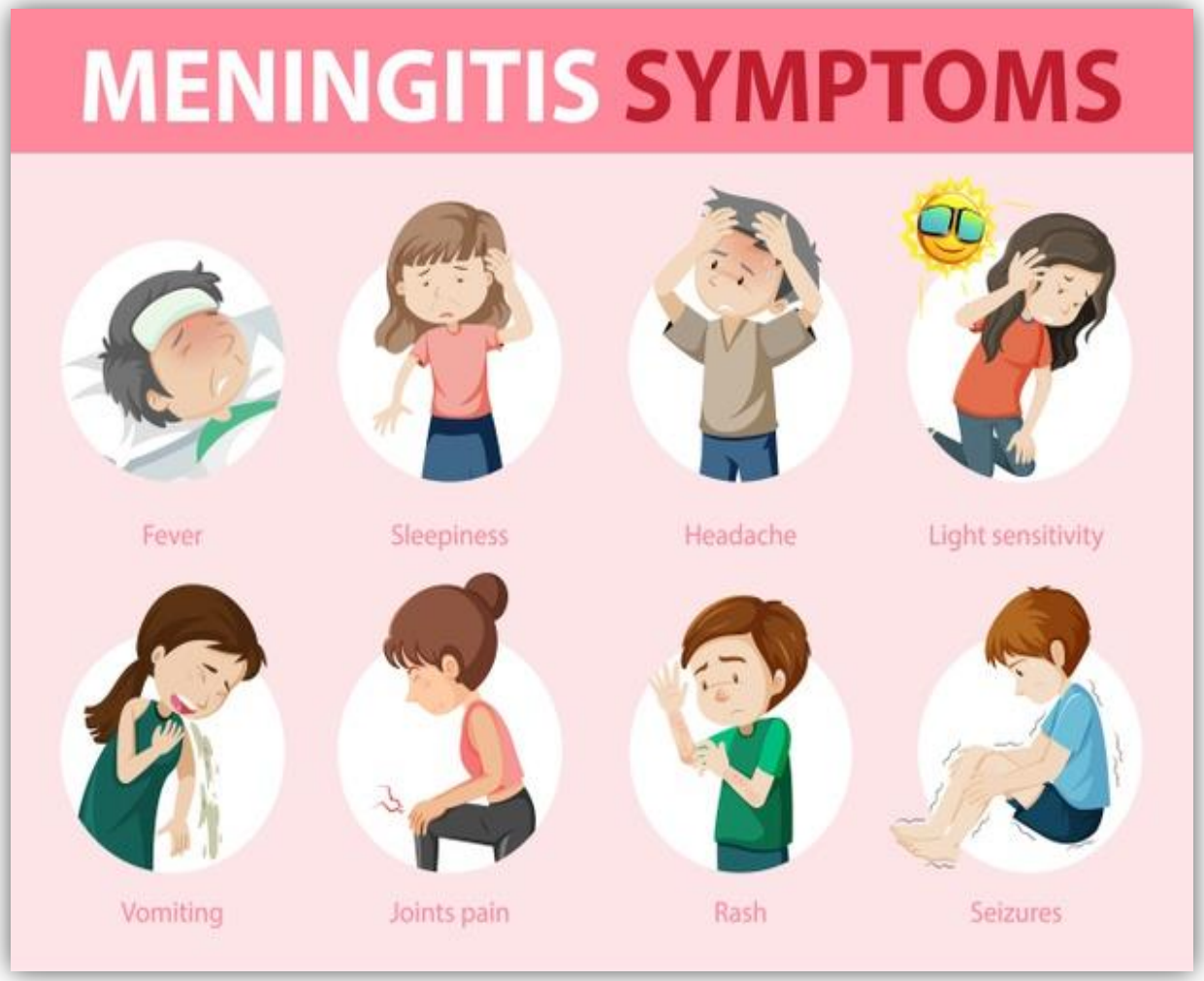
- **Immunity:** is gained from

1. mothers

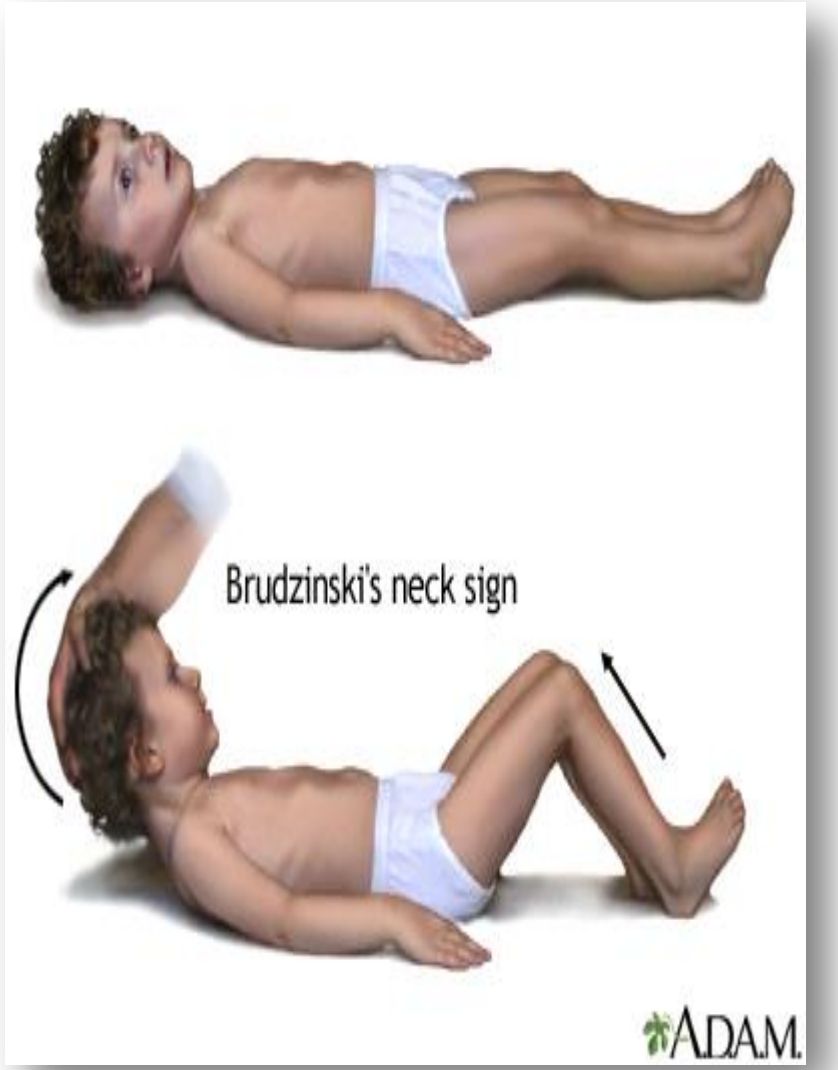
2. Repeated subclinical infection.

3.Clinical cases.

4.Vaccination



- **Clinical picture: sudden onset of**
- Fever.
- Headache.
- Catarrh.
- Neck rigidity.
- Head retraction.
- +ve kernig's sign.
- +ve brodzinski's sign


Brudzinski's neck sign
A.D.A.M.


Kernig's sign
A.D.A.M.

- **Complications:** hydrocephalus, optic neuritis, ocular nerve palsy, nerve deafness, arthritis, and other severe complications , develops seizures in Cerebral vasculitis

- **Fatality: more common in elderly. It** decreases from 50% to 5% by specific treatment. . Altered mental status at presentation is suggestive for poor prognosis

- **Diagnosis :**

1. Clinical picture.
2. Laboratory.
   - Blood culture shows meningococci.
   - CSF exam by lumbar puncture

▶ Nasopharyngeal swab

- The best CSF findings to differentiate viral from bacterial meningitis are lactate levels, protein concentration, and white blood cell (WBC) count, with a CSF lactate concentration greater than 4.2 mmol/L being a highly sensitive and specific indicator of bacterial meningitis. While elevated protein and a high WBC count (especially with a predominance of polymorph nuclear cells) also point to bacterial meningitis and low glucose, viral meningitis typically shows normal glucose, slightly elevated protein

- **Prevention:**

a. **General:**

b. Good ventilation.

c. Avoidance of overcrowding.

d. **Specific:**

1. **Chemoprophylaxis**: by rifampicin 600 mg daily for 3 days.
2. Actually ciprofloxacin is used
3. Ceftriaxone in children and pregnant

2.Vaccination:

- Type: purified meningococcal polysaccharides vaccine.

It is either **monovalent** (A or C) or **bivalent** (A&C) or **polyvalent**.

A-C-Y-W135.

- Administration: single subcutaneous injection for > 2 years.
- Immunity: post vaccination immunity starts after 10 days and lasts for 3 years.
- Timing: a booster dose every 3 years is recommended in case of continuous exposure.

- Target group: Given to **high risk groups** (not indicated as a general measure) in areas exposed to epidemics.

1. Military groups.
2. Old diabetics.
3. School children: 4 doses: kindergarten, 1st primary, preparatory, secondary.
4. International travelers to endemic areas.
5. During pilgrimage.
6. During community outbreaks.

Conjugate meningococcal vaccine

- **b-Monovalent A or C**

Monovalent C combined with haemophilus influenza Type B

- **c-bivalent** (C&Y)
- **D-Quadrivalent** AC-Y-W135.

- **Control:**

a. **Control of Cases:**

- Notification.
- Isolation for 7 days after the start of specific treatment.
- **Treatment:** should begin immediately when clinical diagnosis is made even before meningococci have been identified.
- Penicillin given parenterally is the drug of choice. Ampicillin and chloramphenicol can be used in cases of hypersensitive to penicillin, 3rd generation cephalosporine)
- Disinfection: concurrent and terminal.
- Release: after cure and satisfactory general condition (within 24 hrs. of treatment).

b. Control of contact:

- Enlistment & Surveillance for 10 days.
- No isolation from school.
- Chemoprophylaxis:
- **c- Epidemic measures: (during outbreaks)**

- For closed communities and high-risk groups:
  - Ventilation and spacing.
  - Surveillance, to detect and treat cases. Chemoprophylaxis: by Rifampicin 600 mg once daily/5 days.
  - Vaccination of high-risk groups.

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