Diphtheria

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- An acute upper respiratory tract infection, may affect the tonsils, pharynx, larynx, or nostrils and very occasionally the skin. The characteristic feature is the presence of grayish membrane in the throat, firmly attached and surrounded by inflammation, with enlarged cervical lymph nodes.
- The characteristic lesion caused by liberation of specific cytotoxin. The toxin can cause myocarditis, with heart block and progressive congestive heart failure, beginning about 1 week after the onset. Later effects include neuropathies that may mimic Guillain – Barre syndrome.

- Presumptive diagnosis is based on observation of an asymmetrical grayish white membrane, especially if it extends to the uvula and soft palate and is associated with tonsillitis, pharyngitis or cervical lymphadenopathy, or a serosar guinous nasal discharge. The diagnosis is confirmed by bacteriologic examination of the lesions. If diphtheria is strongly suspected specific treatment with antibiotic and antitoxin should be initiated while studies are pending and should be continued even in the face of a negative lab report.

- **Infectious agent:**
- *Corynebacterium diphtheria* of gravis, mitis, and intermedius biotype. Toxin production results when the bacteria are infected by coryenbacteriophage containing the diphtheria toxin gene tox.

- **Occurrence:**
- A disease of colder months in temperate zones, that primarily involves non immunized children less than 15 years of age, often found among adults in population groups whose immunization was neglected.
- In Iraq, the seasons of high incidence are autumn and winter, the peak being in the former which is the time of school entry, leading to more contact ship between children.
- **Reservoir:** Humans

- **Mode of Transmission:**
- Contact with a patient or a carrier, more rarely contact with articles soiled with discharges from lesions of infected people. Raw milk has served as a vehicle.

- **Types of Carriers:**
- Incubatory, convalescent and contact.
- **Incubation Period:** usually 2-5 days, occasionally longer.
- **Period of Communicability:**
- Variable, until virulent bacilli have disappeared from discharges and lesions, usually 2 weeks or less and seldom more than 4 weeks. Effective antibiotic therapy promptly terminates shedding. The rare chronic carrier may shed the microorganism for 6 months or more.

- **Susceptibility and Resistance:**
- Infants born of immune mothers are relatively immune; protection is passive and usually lost before the 6th month.
- Lifelong immunity is usually, but not always, acquired after disease or unapparent infection.
- Immunization with toxoid produces prolonged but not lifelong immunity.
- Antitoxic immunity protects against systemic disease but not against colonization in the nasopharynx.

- **Methods of Control:**

A- Preventive Measures:

1. Educational measures are important: inform the public, particularly the parents of young children, about the hazards of diphtheria and the necessity of active immunization.
2. The only effective control is wide spread active immunization with diphtheria toxoid.

I. For children less than 7 years of age DPT or DT.

II. For persons of 7 years and older: because of adverse reaction may increase with age, a preparation with a reduced concentration of diphtheria toxoid (adult Td) is usually used after the 7^{th} birthday for booster doses. For previously unimmunized individual, a primary series of 3 doses of absorbed tetanus and diphtheria toxoids, Td is given. The first 2 doses are given at 4-8 weeks intervals and the third dose 6 months to 1 year after the second dose.

III. Active protection should be maintained by administering a dose of (Td) every 10 years thereafter.

IV. Special efforts should be made to ensure that those who are at higher risk such as health workers, are fully immunized and receive a booster dose of (Td) every 10 years.

B- Control of patient, contact and the immediate environment:

1. **Report** to local health authority, case report is obligatory.
2. **Isolation:** Strict isolation for pharyngeal diphtheria, contact isolation for cutaneous disease, until 2 cultures from both throat and nose (and skin lesions in cutaneous diphtheria), taken not less than 24 hours apart, and not less 24 hours after cessation of antimicrobial therapy, fail to show diphtheria bacilli. Where culture is impractical, isolation may be ended after 14 days of appropriate antibiotic treatment.
3. **Concurrent disinfection:** of all articles in contact with patient discharges. Terminal cleaning.

4- Quarantine:

- Adult contacts whose occupation involve food handling, especially milk or close association with non immunized children should be excluded from that work until have been treated and bacteriologic examination proves them not to be carriers. Also child contact should be excluded from school.

5- Management of contacts:

- All close contacts should have cultures taken from the nose and throat, and should be kept under surveillance for 7 days.
- A single dose of benzathine penicillin IM or 7-10 days course erythromycin is recommended for all persons with house hold exposure to diphtheria, regardless to their immunological status.
- Previously immunized contacts should receive a booster dose of diphtheria toxoid if more than 5 years have elapsed since the last dose.
- A primary series should be initiated in non immunized contacts, depending on their age.

6- Investigation of contacts and source of infection: search for carriers using nose and throat cultures.

7- Specific treatment:

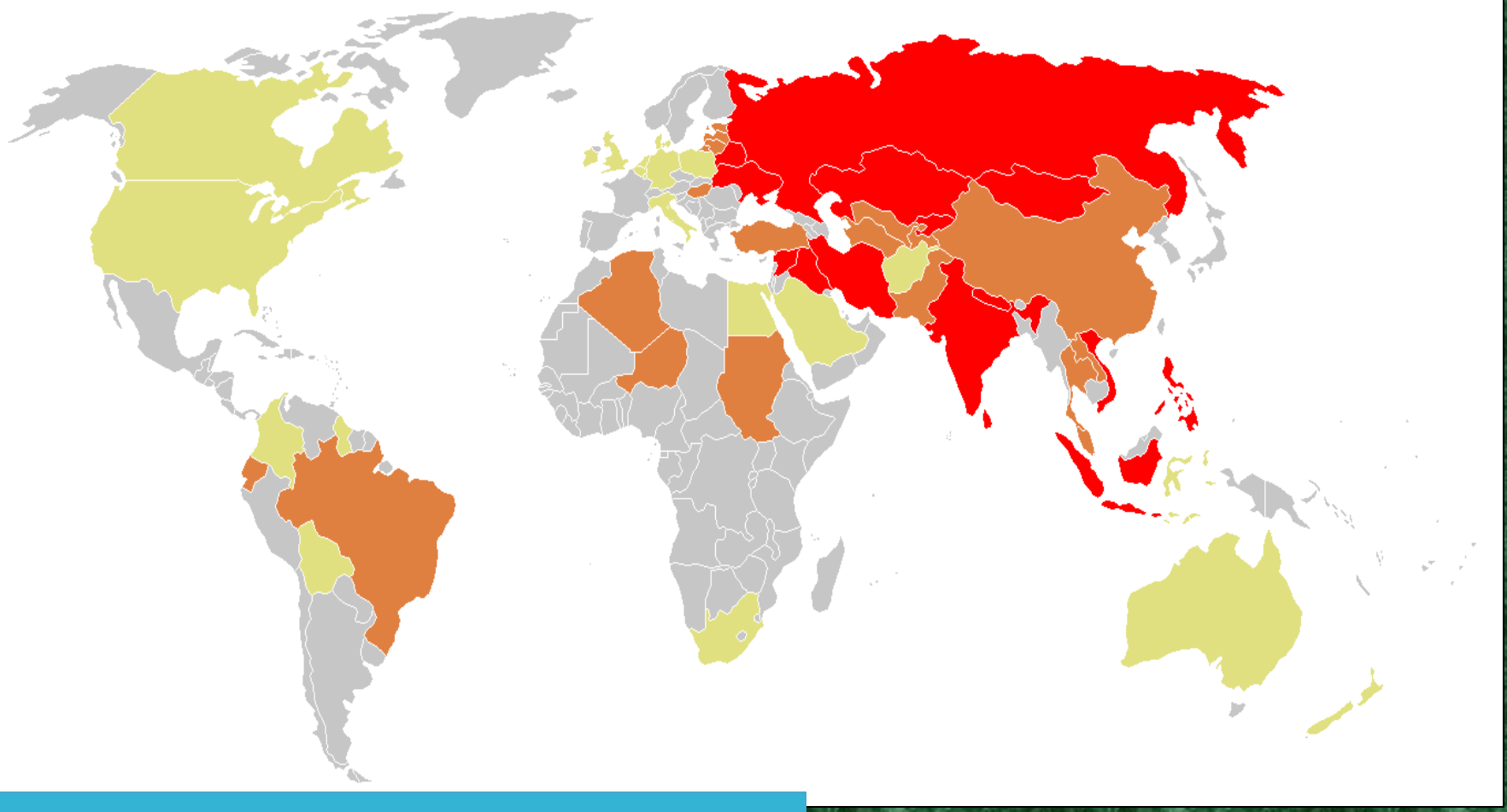
If diphtheria is strongly suspected on the basis of clinical findings, antitoxin should be given immediately after bacteriologic specimens are taken, without waiting for the results.

A single dose of 20,000 – 100,000 units is given IM, depending on the area of involvement and severity of the disease. IM administration usually suffices unless in severe infections, both IM & IV doses may be indicated. Antibiotics are not a substitute for antitoxin.

Procaine penicillin G (25,000 – 50,000 units / Kg / day) fro adults, in 2 divided doses, or parenteral erythromycin (40 – 50 mg / Kg / day) has been recommended until the patient can swallow comfortably.

Erythromycin or penicillin V (125 – 250 mg / 4 times / day), may be substituted for a recommended total treatment period of 14 days. Newer macrolide antibiotics including (azythromycin or clarithromycin) do not offer an advantage over erythromycin.

- **Prophylactic treatment of carriers:**
- A single dose of benzathine penicillin G (IM) 600,000 units for children less than 6 years old, 1,2 million units for older persons, or 7-10 days course of erythromycin (40 mg / Kg / day) for children and (1 g / Kg / day) for adults has been recommended.



Diphtheria Hotspots 1997 - present; cases reported to the WHO

- (Over 100 reported cases)
- (Between 50 and 99 reported cases)
- (1-49 reported cases)
- (No cases reported)

END