
بسم الله الرحمن الرحيم
In the name of ALLAH
the most Beneficent and the most merciful

COMMUNICABLE DISEASES-3

DIPHTHERIA

DIPHTHERIA

- Acute infectious disease caused by toxigenic strains of *Corynebacterium diphtheriae*
- Three main clinical types have been described; anterior nasal, faucial and laryngeal

DIPHTHERIA

- Other parts of body like skin, conjunctiva etc. may also be affected
- *Fatality rate is about 10% in untreated cases and in children under 5 years of age, one out of 5 children who get diphtheria die*
- Diphtheria is a rare disease nowadays

DIPHTHERIA

The bacilli multiply locally, usually in the throat and elaborate a powerful *exotoxin*, which is responsible for:

(a) Formation of a greyish or yellowish "**false membrane**" commonly over the tonsils, pharynx or larynx (or at the site of implantation) with well defined margins

DIPHTHERIA

(b) Enlargement of regional lymph nodes

(c) Marked congestion, oedema or local tissue destruction

(d) Signs and symptoms of toxemia

DIPHTHERIA- AGENT FACTORS

AGENT: The causative agent, *Corynebacterium diphtheriae* is a gram-positive, non-motile bacillus. Four types – *gravis, mitis, belfanti* and *intermedius* are all pathogenic to man. In general gravis infections tend to be more severe than mitis infections.

DIPHTHERIA- AGENT FACTORS

The toxin produced, can affect the heart or the nerves leading to myocarditis or paralysis respectively.

Diphtheria bacilli are sensitive to penicillin and are readily killed by heat and chemical agents. These can survive for short periods in dust and fomites

DIPHTHERIA- AGENT FACTORS

SOURCE OF INFECTION

It may be a case or a carrier.

Cases may be clinical or subclinical.

Carriers are common sources of infection; their ratio is estimated to be 95 carriers for 5 clinical cases.

DIPHTHERIA- AGENT FACTORS

Carriers may be:

1. Temporary or chronic
2. Nasal or throat carriers.

- Nasal carriers are particularly dangerous as source of infection for others.
- *Immunization does not prevent the carrier state.*

DIPHTHERIA- AGENT FACTORS

INFECTIVE MATERIAL

Nasopharyngeal secretions, discharges from skin lesions, contaminated fomites and possibly infected dust

PERIOD OF INFECTIVITY

14-28 days from the onset of disease, unless treated. Carriers may remain infective for much longer periods

DIPHTHERIA- HOST FACTORS

(a)**AGE:** It particularly affects children aged 1-5 years

(b)**SEX:** Both sexes are affected equally

DIPHTHERIA- HOST FACTORS

(c) **IMMUNITY:** Infants born of immune mothers are relatively immune during the first few weeks or months of life. A large proportion of population seems to acquire active immunity through inapparent infection

DIPHTHERIA

ENVIRONMENTAL FACTORS

Cases of diphtheria occur in all seasons, although winter months favor its spread

TRANSMISSION

The disease is spread mainly by droplet infection. However direct transmission from infected cutaneous lesions & transmission by means of contaminated objects and fomites is possible for short period only

DIPHTHERIA

PORTAL OF ENTRY: Commonly the portal of entry is the respiratory route. It may sometimes be the skin, where cuts, wounds and ulcers may get infected; and so is the umbilicus in the newborn. Occasionally the site of implantation may be the eye, genitalia or middle ear

INCUBATION PERIOD: 2-6 days, occasionally longer

DIPHTHERIA

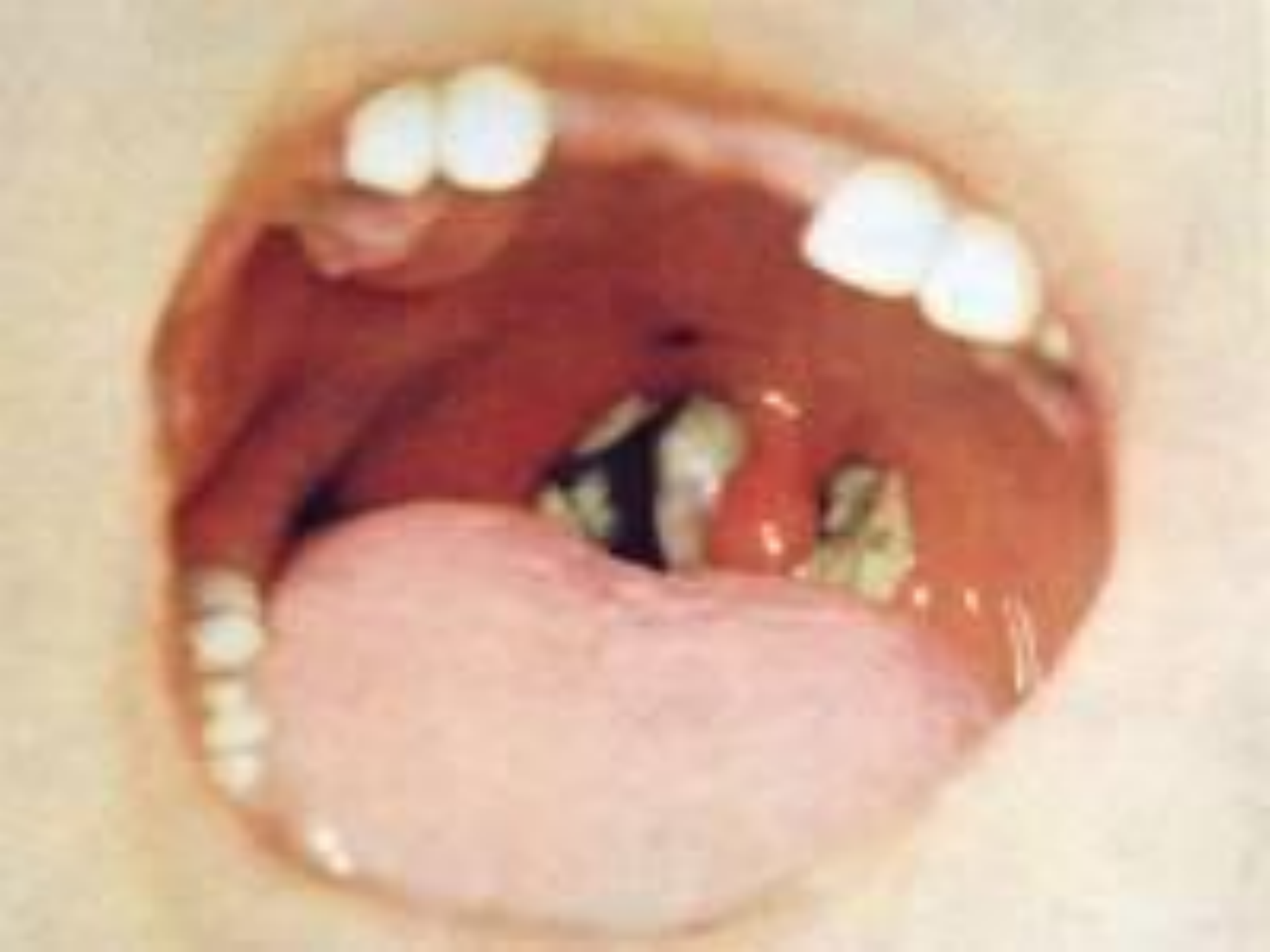
CLINICAL FEATURES

Respiratory tract forms of diphtheria includes nasal, pharyngotonsillar, laryngotracheal, and combination thereof. In pharyngotonsillar type, there is usually a sore throat, difficulty in swallowing and low grade fever.

DIPHTHERIA

(CLINICAL FEATURES)

Signs in throat may be erythema, exudate and membrane formation. The membrane may be localized or wide spread over tonsils, pharynx, soft/hard palate. It may vary in colour from whitish to blue-white or grey-black.



DIPHTHERIA

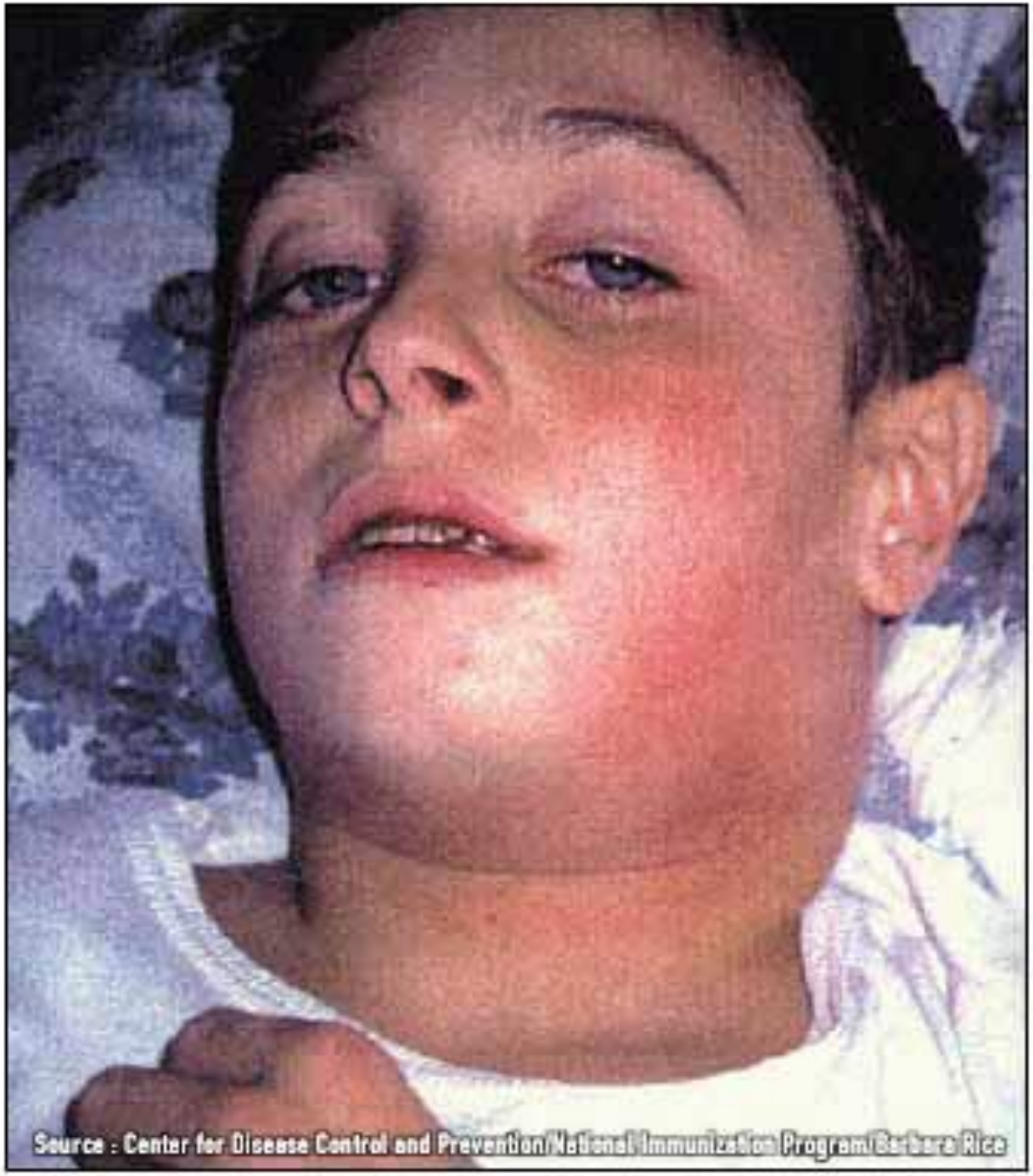
(CLINICAL FEATURES)

- Membrane may be adherent and attempts to remove it may cause bleeding.
- Laryngotracheal diphtheria is associated with hoarseness and croupy cough

DIPHTHERIA

(CLINICAL FEATURES)

- Patients with severe disease may have marked oedema of submandibular area and front of neck along with lymphadenopathy, giving a characteristic "bullnecked" appearance


Source : Center for Disease Control and Prevention/National Immunization Program/Barbara Rice

CONTROL OF DIPHTHERIA

CASES AND CARRIERS

(a) **Early detection by culture:** Throat and nose swabs should be taken from family and school contacts and examined by culture methods.

CONTROL OF DIPHTHERIA

(b) **Isolation:** All cases, suspected cases and carriers should be promptly isolated, in a hospital for at least 14 days or until proved free of infection. At least 2 consecutive nose & throat swabs taken 24 hours apart, should be negative before terminating isolation

(c) **Treatment** of cases and carriers

CONTROL OF DIPHTHERIA

Treatment of cases

When diphtheria is suspected, antitoxin should be given without delay, IM or IV (20,000-100,000 units or more) depending upon severity of the case. Every case should be treated with penicillin or erythromycin for 5-6 days

CONTROL OF DIPHTHERIA

Treatment of carriers

They should be treated with 10 days course of erythromycin, which is the most effective drug for their treatment

CONTROL OF DIPHTHERIA

Contacts: Non-immunized close contacts should receive prophylactic penicillin or erythromycin and 1000-2000 units of diphtheria antitoxin. They should be actively immunized against diphtheria, placed under medical surveillance and examined daily for evidence of diphtheria for at least a week after exposure

CONTROL OF DIPHTHERIA

Community: The only effective control is by active immunization of all infants as early in life as possible. The immunization rate must be maintained at a high level

CONTROL OF DIPHTHERIA

DIPHTHERIA IMMUNIZATION

a. **Single vaccines**

- FT (formal-toxoid)
- APT (alum-precipitated toxoid)
- PTAP (purified toxoid aluminium phosphate)
- PTAH (purified toxoid aluminium hydroxide)
- TAF (toxoid-antitoxin floccules)

CONTROL OF DIPHTHERIA

DIPHTHERIA IMMUNIZATION

b. Combined or mixed vaccines:

- DPT (diphtheria-pertussis-tetanus vaccine)
- DT (diphtheria-tetanus toxoid)
- dT (diphtheria-tetanus, adult type)

c. Antisera

- Diphtheria anti-toxin

CONTROL OF DIPHTHERIA

DPT Vaccine

- It is the preparation of choice for infants
- It can be given safely at 6 weeks after birth
- Three doses (0.5 ml I/M) should be given, with minimum interval of 4 weeks between doses

CONTROL OF DIPHTHERIA

(DPT Vaccine)

- DPT/DT vaccine should not be frozen
- It should be stored in refrigerator at 4 to 8 degree C
- DPT should be given intramuscularly in the thigh(lateral aspect) in infants

CONTROL OF DIPHTHERIA

(DPT Vaccine)

- The most severe complications following DPT vaccination are convulsions/infantile spasms & these are due to pertussis component in DPT
- The estimated risk is 1 : 170,000 doses given

CONTROL OF DIPHTHERIA

DPT Vaccine *is* ***contraindicated*** *in*:

- Seriously ill or hospitalized children
- If a severe reaction occurred after last dose. Subsequent immunization with DT only is recommended without pertussis component
- For immunizing children over 12 year of age or adults, the preparation of choice is dT

CONTROL OF DIPHTHERIA

DIPHTHERIA IMMUNIZATION-ANTISERA

- Diphtheria antitoxin prepared in horse serum is still the mainstay for prophylaxis and treatment
- Prophylactic dose is 1000-2000 unit by S/C or I/M injection
- Therapeutic dose is 20,000-30,000 units by I/M or 40,000-100,000 units by I/V injection


Thank You