

DIPHTHERIA

Causative bacteria is *Corynebacterium diphtheriae* which is G.+ve rod shape .

Incubation period : 2-4 days .

Mode of transmission by air droplets from infected human or carrier .

Pathophysiology : Bacteria inoculated by air droplet usually to upper respiratory tract (tonsils ,pharynx ...etc) or rarely to conjunctiva or genital tract or through skin abrasion ,the infection occur ,the bacteria remain localized then secrete soluble exotoxin which may cause serious effect on the heart and nervous system .

Clinical features :

It usually insidious and fever seldom occur apart from tachycardia. The diagnostic sign is (wash leather) raised gray - greenish pseudo membrane over the tonsils which is firm and elevated edge with surrounding zone of inflammation, it adherent firmly if try to be removed it cause bleeding .There swelling in the neck (bull neck)and tender submandibular lymphadenitis . The infection may infect the nose lead to nasal discharge with blood or it infect the larynx it lead to acute laryngitis and may lead to asphyxia and may need urgent tracheostomy , it may infect fauces or uvula and nasopharynx where the patient is gravely ill death may occur within 10 days from circulatory failure . The late complications results from toxins excreted from bacteria which affect the heart and the nervous system ,on the heart it occur in 25% leads to myocarditis ,cardiac arrhythmias cure usually occur although heart block as a complication occur which is usually irreversible . On nervous system it occur in 75% it occur after cure of the patient (late complications) leads to palatal palsy ,loss of accommodation and polyneuritis all usually reversible and complete cure occur .

Investigations : Nasal and throat swab for Gram 's stain and culture to prove the bacteria .

Management :

The patient must be admitted to hospital in infectious unit with strict isolation of the patient and good protection of the medical staff because disease is highly communicable . Start treatment which includes 1- administration of diphtheria anti-toxin . 2- administration of antibiotics . Treatment begin prior results of investigation came and notification of public health authority . Diphtheria antitoxin of hyperimmun horse serum is given intramuscularly ,it carry risk of anaphylactic reaction or serum sickness, if the anaphylaxis occur it treated by 0.5-1 ML of 1|1000 unit of adrenalin I. m. , small test dose of vaccine if negative the patient receive full dose (100 000 units)for severe disease , in moderate severity 16000 - 40 000 units is used and 4000 – 8000 units used for mild disease . The bacteria is treated by benzyl penicillin 1.2 unit IV. 6 hourly or amoxicillin 500 mg 8 hourly if the patient allergic to

penicillin it is treated by erythromycin capsule 500 mg 6 hourly ,if patient recovered from infection it should receive diphtheria toxoid vaccine because poor immunogenicity after infection . Patient not discharge from hospital till prove that nasal and throat swab is negative 24 hours apart .

Prevention :

All patients should vaccinated by Diphtheria vaccine which is Diphtheria toxoid and booster dose after 10 years to maintain immunity , the carrier is eradicated by erythromycin and all contact should receive erythromycin and vaccinated or have booster dose .

TETANUS

It is caused by *Clostridium tetani* , anaerobic spore forming bacteria live as commensal in gut of human and domestic animals ,the spores live in soil for many years where it contaminate farmers and other people who contact their wounds with contaminated soil , spore also contaminate human by dirty metal ,necrotic wound infection or contamination , contamination of umbilical stump of newborn or secondary infection over aerobic bacterial infection where oxygen tension decrease , the spore in anaerobic media multiply to form clostridium tetani bacteria which secrete exotoxin neurotoxin which has affinity for motor nerve (anterior horn and motor nerve endings) from blood where it do its action on the motor nerve endings lead to muscle contraction .

Incubation period : 2 days to many weeks ,prolong incubation period decrease severity of the disease and vice versa .

Pathophysiology

When bacteria spores enter to human body in aerobic media with low oxygen tension like in necrotic or died tissue as in burn ,non sterile surgery , in female reproductive organ implantable contaminated devices it multiply to bacteria or direct bacterial infection like prick with dirty metals and through Dogs bite , it secrete neurotoxin (tetanospasmin) reach motor nerve endings and transmitted through axonal sheath passing neurotransmitters to reach CNS inhibit neuroinhibitors secretions like GABA lead violent muscle contractions and symptoms of tetanus appears as long as far distance of toxins from CNS as long as incubation period .

Clinical features

The symptoms of tetanus is muscle contraction and twitching called convulsions ,the muscle of jaw contracted lead to lock jaw which is painless differ from lock jaw due to dental abscess ,throat infection . differential diagnosis in this condition is hysteria and phenothiazine overdose, trismus (lock jaw ,difficulty in swallowing and rigidity) it is sign of tetanus . Contraction of frontalis muscle and angles of the mouth lead to what is called risus sardonicus sign . Contraction the muscles of the neck and back lead to arched trunk called opisthotonus sign , board like abdominal wall . Violent muscle spasm of the body (convulsion) occur spontaneously or induced by noise this spasm continued for 3-4 minutes and reoccur many times over the day cause exhaustion to the patient and may cause death due to exhaustion ,asphyxia or aspiration .

Management

Isolation of bacteria is difficult so the diagnosis is clinical . Treatment by :

- a- neutralize tetanus toxins by tetanus anti-toxin 3000 unit ,
- b- prevent further toxin excretion by wound debridement ,benzyl penicillin 600 mg iv. 6 hourly and if allergic to penicillin we use metronidazole .
- c- control spasm by nurse patient in quite room and iv. Diazepam for spasm and no response we should parlays patient by general anesthesia and ventilator .
- d- general measure maintain hydration and nutrition and treatment of secondary infection .

Prevention

Immunization against tetanus by tetanus toxoid given and repeated at one month and 6 months , if patient already immunized booster dose is given . if patient has dirty wound and risk of tetanus penicillin 1200 mg injection followed by 7 days course of treatment plus wound debridement and tetanus anti-toxin 250 U. given IM. .

NOW VACCINE AGAINST DIPHTHERIA ,PERTUSS AND TETANUS AVAILABLE CALLED (DPT) VACCINE .