- **Lecture 3 Mumps .pertussis**

- OBJECTIVES:-
- Have some ideas about:-
- Causative agents of mumps/ pertussis.
- Clinical features and epidemiology of mumps/ pertussis .
- Complications of mumps/ pertussis .
- Management of mumps/ pertussis .
- Prevention of mumps/ pertussis .

• Mumps

Mumps is an acute viral infection caused by RNA virus of paramyxoviridae family. it is endemic in most unvaccinated population.

EPIDEMIOLOGY OF MUMPS

Mumps is spread from person to person by respiratory droplets, contaminated fomites and possibly by urine.

Age : Before vaccination 5-9 yrs old children, now young adults producing outbreak in colleges

- Epidemics occurs at all seasons but are slightly more frequent in late winter and spring.
- The period of maximum infectiousness is 1–2 days before to 5 days after parotid swelling

Clinical features of Mumps:

- Incubation periods range from 5days, peak at 16-18 days , 30-40% of infection are subclinical.
- The typical patient presents with a prodrome lasting 1-2 days and consisting of fever, headache, vomiting, and achiness. Parotitis then appears and may be unilateral initially but becomes bilateral in approximately 70% of cases
- **Mumps parotitis*:*** The pt usually have pain and swelling of the parotid gland 1st fill the space between the posterior border of mandible and mastoid then extend downward and forward and may be preceded or accompanied by ear pain on the ipsilateral side and may proceed rapidly reaching a maximum within few hrs , although it usually peak in 1-3 days and slowly subside within 3-7 days but occasionally lasts longer.
- ***As swelling progresses, the angle of the jaw is obscured and the ear lobe may be lifted upward and outward,*** The swollen area is tender and painful , the pain being elicited by tasting sour liquids such as lemon juice or vinegar the parotid swelling is usually accompanied by low grade fever. Fever and other systemic symptoms resolve in 3-5 days.
- A morbilliform rash is rarely seen.
- Submandibular salivary glands may also be involved

DIAGNOSIS OF MUMPS:-

- When mumps was highly prevalent, the diagnosis is clinical.
- The lab finding includes:-
    - Elevation of S. amylase(normal within 2 wk.)
    - Leucopenia with relative lymphocytosis.

- **Confirmation** :- detection of viral antigen by direct immunofluorescence, or identification of nucleic acid by reverse transcriptase PCR.
- **viral culture** from upper resp sec. ,CSF or urine during the acute illness

COMPLICATION OF MUMPS:-

- Meningoencephalitis is most frequent in childhood especially in male.(in 10-30% of cases)
- **Orchitis& epididymitis :**in pre-pubescent boys is extremely rare, but after puberty, orchitis occurs in 30-40% of males. Infertility is rare even with bilateral orchitis.
- **Oophoritis** is uncommon in post pubertal females but may cause severe pain and may be confused with appendicitis when located on the right side.
- Others: pancreatitis, myocarditis, arthritis, thyroiditis, oophoritis, and sensory neural hearing loss.
- ***TREATMENT OF MUMPS:-*** There is no specific antiviral therapy.
- The treatment is entirely supportive, antipyretic for fever, bed rest as guided by the pt needs, the diet should be adjusted to the pt abilities to chew.
- ***orchitis*** should be treated by local support and bed rest.
- ***Arthritis*** can be treated by 2 wk course of NSAID or steroid.

PREVENTION OF MUMPS

- Pt isolation
- Immunization with the live mumps vaccine is the primary mode of prevention It is given as part of the MMR 2-dose vaccine schedule, at 12-15 mo of age for the 1st dose and 4-6 yr of age for the 2nd dose.
- vaccine effectiveness after 2 doses is 88%

• *Pertussis `` whooping cough``*

- Pertussis is acute respiratory tract infection caused by Gram negative, toxin producing coccobacilli, ***Bordetella pertussis,*** Which is the sole cause of epidemic pertusis.
- ***Bordetella parapertussis*** is an occasional cause (<5%) of sporadic cases.

EPIDEMIOLOGY OF PERTUSSIS

- Pertussis is an endemic disease , with superimpose epidemic cycles every 3-4 yr, it is extremely contagious airborne disease , attack rate approach 100% in susceptible individual.
- Neither natural disease nor vaccination provide complete or lifelong immunity, protection begins to wane 3-5 yr after vaccination .
- In non vaccinated areas it affect 1-5 yr age, while it occur mostly in infants, adolescent,& adults in vaccinated areas.

CLINICAL MANIFESTATION OF PERTUSSIS:

- classically pertussis is a prolonged disease of three main stages:-

1-Catarrhal stage (1-2 weeks):-

- after incubation period of 3-12 days the pt have congestion, rhinorrhea, low grade fever, sneezing and lacrimation.

2-Paroxysmal stage (2-6 week)

- The pt have dry intermittent irritative cough that evolve into paroxysms `***hall mark of pertussis***` start as machine-gun burst of uninterrupted coughs with protruded tongue, bulging watering eyes, chin and chest held forward, the face become purple until the cough cease with a loud whoop (forceful inspiratory gasp),
- post tussive emesis is common in all ages. and exhaustion is universal.
- At the peak of the paroxysmal stage, patients may have more than 1 episode hourly.

3- ***Convalescent stage (≥2 weeks)***:-

- With reduction in number, severity, and duration of episodes of coughing.
- Paradoxically in infants the cough and whoop may be louder and more classic in this stage.
- Infants younger than 3 mo of agedo not display the classic stages.
- Adolescents and previously immunized children have foreshortening of all stages of pertussis.
- Adults have no distinct stages.
- Findings on physical examination generally are uninformative. Signs of lower respiratory tract disease are not expected unless complicating secondary bacterial pneumonia is present. Conjunctival hemorrhages and petechiae on the upper body are common
- **Diffrential diagnosis**:
- Protracted coughing (which in some cases is paroxysmal) can be caused by Mycoplasma, parainfluenza viruses, influenza viruses, enteroviruses, respiratory syncytial viruses, or adenoviruses
- ***Diagnosis of pertussis:-***
- **1-Clinical features**: cough > 14 days, with at least 1 associated symptom of paroxysms, whoop, or post tussive vomiting has a sensitivity of 81% and a specificity of 58% for confirmation of pertussis.
- **2-Lab finding**:
- Leukocytosis:15000-100000 cell/mm3 ,with absolute lymphocytosis.
- Thrombocytosis.
- **3-CXR**: perihilar infiltrates or edema with butterfly appearance and variable atelectasis.
- Parenchymal consolidation suggests secondary bacterial infection. Pneumothorax, pneumo-mediastinum, and air in soft tissues can be seen .
- **4- Confirmation:-**
- Culturing of **deep** nasopharyngeal aspiration.
- D F T: Direct fluorescent antibody test.
- PCR to test nasopharyngeal specimens has sensitivity similar to culture

TREATMENT OF PERTUSSIS

1-Non specific treatment:

- Hospital admission ***:-***Infants younger than 3 mo of age with suspected pertussis usually are admitted to hospital, as are many between 3 and 6 mo of age unless witnessed paroxysms are not severe, as well as are patients of any age if significant complications occur**.**
- Care of feeding, prevent dehydration, removal from aggravating environmental smoke, excessive stimulation, or a dry or polluting heat source

2-Antimicrobial therapy:- use either of:-

- ***Erythromycin:*** 40-50 mg/kg/day in 4 doses for 14 days.
- ***Clarithromycin*** 15 mg/kg day Bd PO for 7days.
- ***Azithromycin:*** 10 mg/kg in a single dose on day 1 , then 5 mg/kg/day on days 2-5
- ***TMP-SMZ***: for pt > 2m :TMP 8 mg/kg/day, SMZ 40 mg/kg/day in 2 divided doses for 14 days
- **ADULTS:-Azithromycin**:500 mg in day1 then 250 mg/day on days 2-5
  Erythromycin: 2 g/day in 4 doses for 14 days.
  TMP-SMZ, 1 g/day in 2 divided doses for 7 days TMP 320 mg/day, SMZ 1,600 mg/day in 2 divided doses for 14 day

COMLPICATION OF PERTUSSIS

1- Apnea: may lead to resp. failure.
2- Secondary bacterial infection such as otitis media and pneumonia (***S. aureus ,S. pneumoniae)***
3- Convulsion (hypoxia, hypoglycemia, hyponatremia due to increase ADH, alkalosis, The only neuropathology documented in humans is parenchymal hemorrhage and ischemic necrosis.)
4- Bronchiectasis and collapsed lobes has been reported rarely after pertussis.
5- Increased intrathoracic and intra-abdominal pressure during coughing can result in conjunctival and scleral hemorrhages, petechiae on the upper body, epistaxis, hemorrhage in the CNS and retina, pneumothorax and subcutaneous emphysema, umbilical and inguinal hernias.

PREVENTION OF PERTUSSIS:-

- ***1 -pt isolation***: pt should placed in respiratory isolation with use of masks by all health care personnel entering the room until 5days after initiation of macrolid therapy .
- ***2-Immunization***: 3 doses of DTaP should be administered during the 1st year of life, at ages 2, 4, and 6 mo of age. In addition to 2 booster doses .
- ***Chemoprophylaxis for contacts:-***A macrolide agent should be given promptly to all household contacts and other close contacts, regardless of age, history of immunization, and symptoms.

References:

- Nelson Textbook of Pediatrics , 20 edition .
- Nelson essentials Textbook of Pediatrics , 6th edition.
- Illustrated textbook of pediatrics.