PERTUSSIS AND MUMPS

:Lecturer

Dr. Emad Maaroof
Al Hadeethee

TUCOM

:Objectives

- Etiology of pertussis.
- Epidemiology of pertussis.
- Clinical manifestation of pertussis.
- Investigations of pertussis.
- Complications of pertussis.
- Treatment of pertussis.

:Objectives

- Causes of mumps.
- Clinical manifestations of mumps.
- Diagnosis of mumps.
- Treatment of mumps.
- Complications of mumps.
- Prevention of mumps.

PERTUSSIS

Note: Pertussis name is preferable to the **Whooping cough** because most infected individuals do not "whoop"!.

Etiology :

Bordetella pertussis*, *B. parapertussis* & *B. bronchiseptica (which is a common animal pathogen).

B.pertussis is **gram-negative coccobacilli** that colonize only ciliated epithelium.

Pertussis toxin (PT) is only secreted by *B. pertussis* which has numerous biologic activities.

Epidemiology:

B. pertussis is the only cause of epidemic & the usual cause of sporadic pertussis; whereas *B. parapertussis* is an occasional cause of sporadic pertussis.

Pertussis is extremely contagious with attack rates as high as **100%** in susceptible individuals exposed to aerosol droplets at close range.

After intense exposure as in households, the rate of **subclinical infection** is as high as **80%** in fully immunized or previously infected individuals because neither natural disease nor vaccination can provide complete or lifelong immunity against reinfection or disease; whereas chronic carrier is **not** documented in human.

Clinical manifestations:

I.P. ranging from 3–12 days. Pertussis is a prolonged disease that usually divided into 3 stages:-

Catarrhal stage (1–2 wk) begins insidiously as flu- .1 like illness e.g. low-grade fever, rhinorrhea, .sneezing, and lacrimation

2. **Paroxysmal stage** (2–6 wk), the cough begins as a dry, intermittent, irritative hack that evolves into a machine-gun burst of uninterrupted coughs which followed by whoop, exhaustion & vomiting (post-tussive emesis); at the peak of the paroxysmal stage there may be >1 episode/hr.

3. **Convalescent stage** (≥2 wk) begins when the number, severity, and duration of episodes diminish.

Infants < 3 months do not display classical stages; the catarrhal phase lasts only a few days or is unnoticed; cough may not be prominent or manifests as expiratory grunt; whoop infrequently occurs in infants <3 mo; whereas cyanosis can follow a coughing paroxysm.

Apnea may be the only symptom & can occur without cough. The paroxysmal and convalescent stages in young infants are lengthy.

Paradoxically, in infants the cough and whooping may become louder and more classic in the convalescent stage.

Exacerbation of cough may recur after subsequent RTI.

Findings on physical exam are generally uninformative. Signs of lower respiratory tract disease are not expected unless complicating secondary bacterial pneumonia is present.

Note: Pertussis should be suspected in any individual who has pure or predominant complaint of cough for ≥2 wk duration with at least 1 associated symptoms of either: paroxysms, whoop, or post-tussive emesis. Protracted coughing can be produced by *Mycoplasma* & respiratory viruses (differential diagnosis).

Investigations:

CBP: Leukocytosis (15,000–100,000 cells/mm3) is due to **absolute lymphocytosis** (which is the characteristic of **catarrhal stage**); it is due to normal T- & B-cells.

Extreme leukocytosis has been correlated with severe course of disease and death

- **CXR** only **mildly abnormal** e.g. perihilar infiltrate or edema & atelectasis.

Parenchymal consolidation suggests secondary bacterial infection.

Culture of *B. pertussis* remains the gold standard for Dx. Specimen is obtained by deep nasopharyngeal aspiration or by use of swab held in the posterior nasopharynx for 15–30 sec (or until coughing).

Direct Fluorescent Antibody (DFA) & PCR of potential isolates are rapid tests that maximize recovery.

Note:

The culture, DFA & PCR are usually +ve during the catarrhal and early paroxysmal stages.

Complications:

Mainly affect the young infants e.g.

- **Pneumonia** (25%), mainly caused by ***Staphylococcus aureus, Streptococcus pneumonia*** or "oropharyngeal flora".
- **Seizures** (4%), may be due to hypoxemia, I.C. hemorrhage or hyponatremia due to SIADH.

- **Encephalopathy** (1%).
- **Respiratory failure** may occur due to apnea or secondary bacterial pneumonia, especially if associated with pulmonary hypertension or hemorrhage.

Sequelae of ↑ intrathoracic and intra-abdominal pressure during coughing include: conjunctival, scleral, and retinal hemorrhages, I. C. hemorrhage, petechiae on the upper body, epistaxis, pneumothorax and subcutaneous emphysema, umbilical and inguinal hernias.

- **Death** has been associated with hx of prematurity & young maternal age. Pertussis may be a cause of SIDS

Treatment:

Indicatios of admission to the hospital include:
***infants below 3 mo* (especially when there is hx of prematurity).**
**** infants above 3 mo* when there is underlying diseases, complications (as above) or severe paroxysm that characterized by: duration >45 sec; cyanosis; bradycardia; hypoxia; paroxysm is not end by whoop or strength for self-rescue or cannot expectorate mucus plug; and post-tussive unresponsiveness**

The infant should have ***intubation and ventilation if there is hx of respiratory failure, repeated apnea, or life-threatening events***.

- Antibiotics should always be given when pertussis is suspected or confirmed primarily to limit the spread of infection and secondarily for possible clinical benefit.

Macrolides are the preferred agents e.g. **Azithromycin**, 10 mg/kg once daily for 5 days (for infants <6 mo) & 10 mg/kg in 1st day then 5 mg/kg for subsequent 4 days (for infants >6 mo & children), **Erythromycin** 40-50 mg/kg ÷ 4 for 2 wk; or .**Clarithromycin** 15 mg/kg ÷ 2 for 1 wk

:Note

Erythromycin & Clarithromycin should not .given to infant below 1 mo of age

TMP-SMZ is an alternative agent to macrolide but it also contraindicated in infants below 2 mo

Adjunctive therapy:

- Patients should be nursed in a quiet, dimly light room with **oxygen & suction** (but it may provoke the paroxysm).
- **mist** by tent may ameliorate thicksecretions.
- **Feeding** between paroxysms is important but avoid over feeding.
- **corticosteroids & bronchodilators** e.g. β-agonists are in controversial use.
- All patients (including suspected cases) should be placed in a room with **respiratory isolation** with use of mask by all health personnel who enter the room **till 5 days** of initiation of macrolide .

Macrolide prophylaxis should also be given to all household or any close contacts regardless of age, .symptoms or immunization status

Prevention:

By immunization schedule as a part of DPT (killed bacteria) in $2^{nd,}$ 4^{th} and 6^{th} months and 2 boostering doses (after 18 months and during preschool age) in addition to other measured mentioned before.

:Note

Protection against typical disease begins to wane 3–5 yr after vaccination and is unmeasurable .after 12 yr

Mumps:

Mumps is a viral infection that primarily affects the parotid glands.

Causes:

The cause of mumps is the mumps virus of the *Rubulavirus* genus and *Paramyxovirus* family , which spreads easily from person to person through infected saliva. If the patient is not immune, he can contract mumps by saliva droplets of an infected person who has just sneezed or coughed also by sharing utensils or cups with infected person.

Clinical Manifestations:

Some people infected with the mumps virus have either no signs or symptoms or very mild ones. When signs and symptoms do develop, they usually appear about two to three weeks after exposure to the virus and may include:

Swollen, painful salivary glands on one or both sides of face (parotitis)
Fever
Headache
Muscle aches
Weakness and fatigue
Loss of appetite
Pain while chewing or swallowing

The primary and best known sign of mumps is swollen salivary glands that cause the cheeks to puff out.

Diagnosis:

During an outbreak, a diagnosis can be made by determining recent exposure and parotitis. A physical examination confirms the presence of the swollen glands. Usually, the disease is diagnosed on clinical grounds, and no confirmatory laboratory testing is needed.

If there is uncertainty about the-
diagnosis, a test of saliva or blood may
.be carried out for **viral culture**
technology, has also been**) PCR(-**
.developed
Blood test can detect the **antibodies-**
.against mumps virus
- As with any inflammation of the
salivary glands, the serum level of
the **amylase enzyme** is often elevated.

Treatment:

Because mumps is caused by a virus, antibiotics aren't effective. Fortunately, most children and adults recover from an uncomplicated case of mumps within about two weeks.

As a general rule, patient is no longer considered contagious and may safely return to school one week after a diagnosis of mumps.

If child has mumps, time and rest are the best treatments. But there are some steps to ease pain and discomfort and keep others from becoming infected

Rest in bed until the fever goes away.
Isolatation to prevent spreading the disease to others.
Pain killers, such as acetaminophen or a nonsteroidal anti-inflammatory drug such as ibuprofen to ease symptoms.

Use a warm or cold compress to ease the pain of swollen glands.

Avoid foods that require lots of chewing. Instead, try soups or soft foods.

Avoid sour foods, such as citrus fruits or juices, which stimulate saliva production.

Encourage fluids drinking.

Complications:

Complications of mumps are potentially serious, but rare.

- **Orchitis**: causes one or both testicles to swell in males who've reached puberty. Orchitis is painful, but it rarely leads to sterility.

Pancreatitis: pain in the upper abdomen, nausea and vomiting.

- **Oophoritis and Mastitis**: in females who've reached puberty. Fertility is rarely affected.
Encephalitis and Meningitis.
Hearing loss. In rare cases, mumps can cause hearing loss, usually permanent, in one or both ears.

Prevention:

In general, child is considered immune to mumps if he had previously infected or immunized against mumps.

The mumps vaccine is usually given as a combined measles-mumps-rubella (MMR) inoculation (live attenuated viruses) at 15 months age, which contains the safest and most effective form of each vaccine.

THANK YOU