COMMON COLD (Rhinitis)… SHEET #1 (lectures 1&2)

- It is a benign self-limited syndrome caused by several families of viruses (9) with at least 200 known subtypes and more viruses are to be discovered.
- The most frequent acute illness in industrialized world.
- Mild URT illness involving:
  Sneezing, Nasal congestion, Discharge, Sore throat, Cough, Low grade fever, Headache, Malaise.

- ***<u>Causes of common cold:</u>***

Rhinovirus (<100 serotypes exist), account for 30-50% of cases (most common)

Coronavirus (10-15%).

Influenza virus 5-15%.

RSV (Respiratory syncytial virus) 5%.

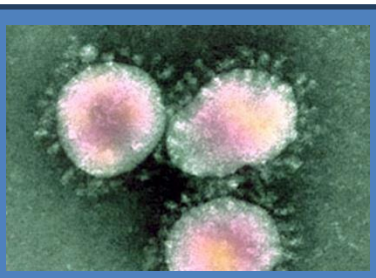
Para influenza virus 5%.

Unknown 20-30%.

Rhinovirus may survive on environmental surfaces for several hours

A single organism can cause many syndromes and a syndrome can be caused by more than one organism.

- Adenoviruses and Enteroviruses can also cause common cold. (different percentages)
  Adenovirus causes pharyngitis & fever more than cold symptoms. It also causes severe pneumonia in immunocompromised patients. It has shown that outbreaks and epidemics of pneumonias are seen mostly in military and crowded areas including hospitals and daycare centers (Because it is highly infectious).



The corona virus has crown shaped Receptors which are the reason for The nomenclature as it is shown in the picture.

Enteroviruses are a large group of viruses associated with several human and mammalian diseases. Two of these viruses, Echoviruses and Coxsackie can cause common cold; they are usually asymptomatic or sometimes can cause an undifferentiated febrile illness.

- Respiratory viruses are capable of re-infection (due to variations of the viruses and to the different strains of a single virus that can affect our immune system).However, the subsequent infections are usually milder than the primary one.

❖ ***Incidence/epidemiology of common cold:***

- It affects almost everybody but retreats with age due to the development of the immune system.
- Children: 5-7 episodes per year until 6 years, then becomes less frequent.
- Adults: 2-3 episodes per year.

❖ ***Seasonal Patterns: (very important)***

- Rhinovirus causes common cold all year round, but especially in spring and autumn
- Para influenza: spring and autumn.
- RSP: spring
- Corona: winter & spring.
- Enteroviruses: usually in the summer.
- Adenoviruses: not seasonal but outbreaks may occur in military facilities, daycare centers and hospital wards. It is highly infectious; cautions must be taken to avoid transmission of the disease.

Transmission:

1. Droplet infection: small or large droplets, but mostly large droplets.
   Note: Large droplets can't travel long distances since they are heavier.
   Small droplets can travel a longer distance.
2. Direct contact: hand-hand transmission is the most common route (hand shaking)
3. Fomites – Rhinoviruses viruses may survive on environmental surfaces for several hours

Notes:

-Viruses remain viable on human skin for up to 2 hours.
-Hand to hand is the most important mode of transmission.
-not all person to person communication can cause transmission of the virus, it depends on: Amount of time people spend together, amount of viruses that are shed from one person to another and proximity.
-Viral shedding lasts for 1 day prior to the appearance of symptoms, and reaches its peak on the 2nd and 3rd day, then it will decline. It can go on for 2 weeks especially in children and immuno-compromised pts because they have lower immunity and so the virus sheds for longer periods of time.

❖ ***People at risk:***

- Exposure to children in day care settings.
- Psychological stress and extreme exhaustion.
- Moderate physical exercise decreases the risk.
- Less sleep and preexisting sleep disturbances: this is controversial;
  - Some say it's irrelevant. Others believe that sleep deprivation lowers immunity and increases susceptibility to common cold. (This is often seen in students who overwork themselves during exams period and end up getting sick.)
- Cold climate doesn't have an impact on the incidence.
  - Incidence of infection of common cold in the North pole is the same as everywhere else.
  - During winter, due to higher/lower humidity, the viral transmission rate (spread) increases.

- As human beings, our susceptibility to the virus has nothing to do with the climate/temperature, but the transmission and the spread of the virus is the one that's affected by the climate and the seasonal changes.

❖ ***Risk factors that increase severity of URTI:***

- Underlying chronic disease: heart failure, diabetes, etc. (might end up with more severe symptoms)
- Congenital immunodeficiency disorders.
- Malnutrition.
- Smokers.

❖ ***Clinical Features:***

- The clinical features are due to the immune response to the virus.
- They're variable from patient to patient.
- Most important symptoms: Rhinorrhea (runny nose), Rhinitis, and nasal congestion. (these are the telling signs).
- Others: Sore throat, cough, malaise, fever (fever is not common in adults, but more common in children), conjunctivitis (Adenovirus)

The overall intensity/severity/type of symptoms depend on :

- Age
- Underlying illnesses (overall health)
- Prior immunological experience (e.g. vaccines)
- Type of infecting virus (Adenovirus is associated with severe symptoms thus considered one of the worst types of viruses)

- Nasal obstructions, rhinorrhea and sneezing
  1st day: sore throat. 2nd and 3rd day: nasal obstruction and rhinorrhea .3rd day nasal symptoms are dominant. 4th 5th day: cough becomes troublesome and nasal symptoms will decrease. Nasal discharge might be purulent (pus-containing).
    - Purulent nasal discharge occurs:
      - **In common cold**

      -In common cold, secretions are usually clear but they might be purulent as well.
      -Purulent discharge in common cold isn't anything serious and it's only a part of the syndrome.
      - **With a secondary bacterial infection (sinusitis, pneumonia**)

    - Because of this, some people might start taking antibiotics when there is purulent nasal discharge, mistaking common cold for sinusitis.

    - Purulence alone cannot distinguish between common cold and sinusitis. Other ways could be used; medical history of the patient, laboratory tests, physical examinations.

❖ ***Incubation Period:***

- Usually: 1-3 days.
- Disease course: 3-10 days.
  25% of people: may last as long as 2 weeks.

❖ ***Diagnosis:***

- Clinical diagnosis: Rhinitis, malaise, cough, slight fever etc.
- Physical examination: conjunctivitis, nasal mucosal swelling, nasal congestion, pharyngeal erythema seen on examining the throat, but not necessarily tonsillitis (tonsillar erythema or swelling might be observed).
- Adenopathy is uncommon (not prominent)
- The lung exam is usually normal in 99% of the cases. Wheezing could be seen:
  - It could be a sign of bronchospasm (extremely rare unless the patient suffers from asthma)
  - Caused by a pre-existing asthma, or asthma that developed due to this infection
- No need for chest x-ray or CT scan unless you suspect pneumonia (dyspnea, fever) or the patient became immunocompromised.
  - How do we know if the patient has pneumonia or developed a lower respiratory tract infection? In this case there might be **dyspnea** (shortness of breath), **lower respiratory tract symptoms**, **high fever**, **hypoxia**. (99% of patients with common cold don't suffer from this)
- Ultimate diagnosis → Isolation of virus by culture of nasal swabs or washings
  Check for influenza if the person is at risk of complications or if it happens to be influenza/flu season.

❖ ***Differential Diagnosis:***

Differentiating between rhinitis and bacterial infections, such as:

- **Allergic or seasonal rhinitis:**
  Patients do not suffer from cough or sore throat (except if they have asthma).
- **Bacterial pharyngitis or tonsillitis:**
  Follicles on the tonsils + congestion (no runny nose).
- **Acute bacterial rhino sinusitis:**
  Facial pain and purulent discharge, but these symptoms fluctuate. Classically, it starts with an URT infection → 7 days later → they get better / fewer symptoms → these symptoms appear once again.
- **Influenza:**
  Mainly fever and joint pain are the major symptoms.
  (Headache, malaise, runny nose is a minor issue, arthralgia, myalgia, etc).
- **Pertussis:**
  Dry cough is more pronounced and may go on for 2 weeks or more, vomiting, etc.

*these symptoms can overlap

❖ ***Complications:***

- Acute Rhino sinusitis:
  Sinusitis is very rare but it can complicate URTI including viral infections.
- Lower Respiratory Tract Disease: Asthma attacks and COPD.
- Cough: may last up to 1 month. Due to postnasal drip, or reactive airway disease but it is usually temporary.
- RSV(Respiratory Syncytial Virus) causes LRT diseases in children, adults, Immune compromised patients, and causes exacerbations and sometimes congestive heart failure in elderly people.
- Asthma.
- Acute Otitis media: The presence of a malfunction in the Eustachian tube will predispose the patient to a bacterial infection.

❖ ***Treatment:***

- Supportive care
- Antibiotics are not indicated:
  - Antibiotics are the major source of abuse.
  -antibiotics are indicated for sinusitis or otitis media (bacterial infection)
  **Make sure to be accurate before diagnosing sinusitis **
- Anti-histamine.
- Non-steroidal
- Rest

❖ ***Prevention:***

Frequent Hand washing, environmental disinfection.

❖ ***Summary:***

- Rhinovirus is the most common cause of common cold.
- Common cold is the most frequent acute illness in industrialized world.
- Viruses remain viable on human skin for up to 2 hours.
- Hand to hand contact is the commonest way of transmission.
- Usually the duration is 10 days
- Please be careful before diagnosing sinusitis because it requires ANTIBIOTIC UNLIKE COMMON COLD.

Rhinovirus:

- Picornaviridae family.
- Small virus.
- Single RNA.
- More than 100 subtypes and all can cause the disease.
- Incidence of infection : Infants > children>>>adult.
- All year round, esp. in fall + spring.
- Incubation period :1-2 days
- Children: It can cause Bronchitis, Bronchiolitis and Bronchopneumonia.

❖ ***Pathology:***

This virus has two receptors: **ICAM-1 (intercellular adhesion molecule)** and **LDLR** (90% of the viruses have ICAM-1 receptors, while the remaining 10% have LDLR receptors), these receptors allow attachment of the virus to the cells of the epithelial lining of the mucosa of the respiratory tract. Once attached, an inflammation process will occur (release of chemokinesand cytokines (IL-1, IL-6, INF-α, INF-β…) and recruitment of inflammatory cells), and then common cold develops.

(Attachment > Endocytosis > Inflammation > Inflammatory cells > Common cold).

THAT'S ALL FOLKS !