



Influenza and Bacterial Infection

Why in News

Recently, researches at **Sweden's Karolinska Institute** have come out with findings on **superinfections** and have also highlighted that **influenza makes people more susceptible to bacterial infections**.

Key Points

- **Superinfections:** These are infection **occurring after or on top of an earlier infection**, especially following treatment with broad-spectrum antibiotics. It is an overgrowth of an opportunistic pathogen from the bacterial or yeast imbalance of systemic antibiotics.
 - For example, **influenza** is caused by a **virus**, but the **most common cause of death** in influenza patients **is secondary pneumonia**, which is caused by **bacteria**.
 - However, the **reason** behind influenza infections leading to an increased risk of bacterial pneumonia is **not known**.
- **Case study of Spanish Flu:**
 - It was an **influenza pandemic** that swept across the world in the year **1918-1920**.
 - It disproportionately hit young healthy adults and important reason for this was **superinfections** caused by bacteria, in particular **pneumococci**.
 - **Pneumococcal infections** are the most common cause of community acquired **pneumonia** and a leading global cause of death.
 - A prior **influenza** virus infection is often followed by a **pneumococcal infection**.
- **Findings of the Research:**
 - When an individual is **infected by influenza** different **nutrients and antioxidants, such as vitamin C**, leak from the blood.
 - The absence of nutrients and antioxidants **creates a favourable environment for bacteria in the lungs**.
 - The bacteria **adapt to the inflammatory environment** by **increasing** the production of an enzyme called **High temperature requirement A (HtrA)**.
 - The presence of **HtrA** weakens the **immune system and promotes bacterial growth in the influenza-infected airways**.
 - The **ability of pneumococcus to grow** seems to **depend on the nutrient-rich environment with its higher levels of antioxidants** that occurs during a viral infection, as well as on the **bacteria's ability to adapt to the environment and protect itself** from being eradicated by the immune system.
- **Significance:**
 - The results could be **used to find new therapies for double infections between the influenza virus and pneumococcal bacteria**.
 - A possible strategy can therefore be **use of protease inhibitors to prevent pneumococcal growth** in the lungs.

- The information can **contribute to the research on Covid-19.**
 - However, it is still not known if **Covid-19 patients are also sensitive to such secondary bacterial infections.**

Influenza

- It is a **viral infection that attacks the respiratory system** i.e. nose, throat and lungs and is commonly called the **flu**.
- **Symptoms:** Fever, chills, muscle aches, cough, congestion, runny nose, headaches and fatigue.
- **Common Treatment:**
 - Flu is primarily treated with **rest and fluid intake** to allow the body to fight the infection on its own.
 - **Paracetamol may help** cure the symptoms but **Non Steroidal Anti-inflammatory Drugs (NSAIDs)** should be avoided. **An annual vaccine can help prevent** the flu and limit its complications.
- Young children, older adults, pregnant women and people with chronic disease or weak immune systems are at high risk.

Pneumonia

- It is an infection that **inflames the air sacs in one or both lungs**. The air sacs may fill with fluid or pus.
- **Cause:** Variety of organisms, including bacteria, viruses and fungi.
- **Symptoms:** Cough with phlegm or pus, fever, chills and difficulty breathing.
- **Treatment:** Antibiotics can treat many forms of pneumonia. Some forms of pneumonia can be prevented by **vaccines**.
- The infection can be **life-threatening to anyone**, but particularly to **infants, children and people over 65**.

Source:IE

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