

Airborne Infections

Introduction

An infection is an invasion and multiplication of microorganisms in body tissues, especially those causing local cellular injury due to competitive metabolism, toxins, intracellular replication, or antigen-antibody response. An airborne infection is an infection that is contracted by inhalation of microorganisms or spores suspended in air on water droplets or dust particles.

Viruses and bacteria can be aerosolized through coughing, sneezing, laughing or through close personal contact. These pathogens ride on either dust particles or small respiratory droplets and can stay suspended in air and or are capable of traveling distances on air currents.

The causative agents of diseases are viruses, bacteria and parasites. The source of the disease is human, animal, external environment (*Legionella*, fungi).

The Spread of Disease

- Depends on the size of droplets:
 - droplets larger than 100 µm fall to the ground and dry out. These become contaminated with dust, which can later be inhaled or get into the body through direct contact.
 - droplets smaller than 100 µm remain in the air and may travel over short distances depending on surrounding conditions.
 - very small droplets smaller than 5 µm dry up instantly and therefore remain in the atmosphere for a longer period of time. Also smaller droplets have the ability to better infiltrate the organism.

Exposure

The risk of infection increases with increased duration of exposure to an airborne pathogen. In other words people who are in proximity of an infected person over a long period of time are at greater risk than those who have very limited contact with the source. Healthcare workers are at particular risk.

A number of other factors can also affect the probability of contracting the infection.

- unsanitary households
- overcrowding
- susceptibility – whether the potential host has a weakened immune system because of another illness or malnutrition

Common Symptoms

Often, airborne diseases can be as minor as the common cold or the typical flu. Symptoms would include: coughing, sneezing, sinus congestion, itchy and watery eyes, sore throat, and fatigue.

The Most Common Airborne Infections

Viruses

- mononucleosis (EB virus)
- chickenpox (shingles)
- MMR – Mumps, Measles, Rubella
- acute respiratory disease - *Influenza*, *Adenoviruses*, *Rhinovirus*, etc.

Bacteria

- TB (Tuberculosis *Mycobacterium*)
- diphtheria (*Corynebacterium diphtheriae*)
- pertussis (*Bordetella pertussis*)
- *Haemophilus influenzae B* – epiglottitis, meningitis
- meningococcus (*Neisseria meningitis*)
- *Legionella* – Legionnaires disease, Pontiac fever

Prevention

The best way to prevent contracting airborne diseases is to keep your distance from anyone who is affected, washing hands regularly, and covering up when sneezing and coughing. This will reduce the risk of bacteria and pathogenic microbial agents entering the body through the air.

As Health care workers face a greater risk of exposure to airborne pathogens, they must follow particular and strict guidelines of prevention. Standard Precautions and Droplet Precautions should be used when caring for any patient with symptoms of respiratory illness

Vaccines

A number of airborne infections are easily avoided through vaccination. Some are part of the standard schedule of vaccinations in most countries (e.g. MMR, diphtheria, pertussis) while others are optional (chickenpox) or only given to at risk groups (meningococcal – college students)

One airborne infection has been eradicated through vaccination – smallpox.

Links

Related articles

- Alimentary Infections

Bibliography

- BENCKO, Vladimír, et al. *Hygiene and epidemiology : selected chapters*. 2. edition. Prague. 2008. ISBN 80-246-0793-X.

External Links

- Nákazy přenášené vzdušnou cestou at WikiSkripta (http://www.wikiskripta.eu/index.php/N%C3%A1kazy_p%C5%99en%C3%A1%C5%A1en%C3%A9_vzdu%C5%A1nou_cestou)
- Airborne disease at Wikipedia (http://en.wikipedia.org/wiki/Airborne_disease)