Respiratory tract infections

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Introduction

The respiratory system functions as an air dispenser and a gas exchanger, so that oxygen may be supplied to, and carbon dioxide removed from, all the body cells. The respiratory system also filters, warms, and humidifies the air that is breathed in.

The upper-respiratory tract consists of the nose, the sinuses, the pharynx and larynx. The lower respiratory tract comprises the trachea, the bronchi, and the lungs.

Infections of the respiratory tract represent some of the most common acute illnesses, ranging from the common cold, rhinitis, and sinusitis, to bronchitis and pneumonia. This article will provide a brief overview of some of these infections, their treatment, and prevention.

Upper respiratory tract infections

Upper respiratory tract infections (URTIs) include the common cold, influenza, rhinitis, sinusitis, pharyngitis, and laryngitis. Most URTIs are viral in origin, but bacterial infections may develop.

Symptoms often include a runny nose, blocked nose, sore throat, malaise, fever, sneezing and coughing. Viral URTIs tend to be self-limiting, but complications such as bacterial infections and the development of lower respiratory tract symptoms, may require further intervention. Some of these, such as epiglottitis and laryngotracheitis (croup), may cause severe breathing difficulties and require urgent medical intervention.

Lower respiratory tract infections

Lower respiratory tract infections (LRTIs) include bronchitis, bronchiolitis and pneumonia. LRTIs, e.g. pneumonia or bronchitis, may develop following an upper respiratory infection, such as a cold. The main symptom of a LRTI is a cough. Other symptoms may include chest tightness, an increased breathing rate, breathlessness and wheezing.

Causes of respiratory infections

The most frequent acute respiratory infection is the common cold. Most URTIs are caused by viruses. Rhinovirus, parainfluenza virus, coronavirus, adenovirus, respiratory syncytial virus (RSV), and the influenza virus, account for most cases.

LRTIs are usually viral in origin, but bacterial infections may develop. Bronchiolitis affects many children under the age of two years. The most likely cause of bronchiolitis is RSV. RSV is the most common cause of LRTIs in children under the age of one year. In adults, RSV is a significant cause of LRTI in elderly or immunocompromised patients. Most cases of bronchitis are viral. However, whooping cough (pertussis) is caused by a bacterium called *Bordatella pertussis*.

Treatment

Most respiratory tract infections resolve without the need for treatment. However, the symptoms may cause discomfort. Headaches, muscle pains and fever may be improved with analgesics and antipyretics, such as ibuprofen and paracetamol. Aspirin should never be given to children under the age of 16 years, due to the risk of Reye’s syndrome.

Nasal congestion and runny nose symptoms may improve with the use of decongestants. Oral decongestants should be used cautiously in patients with certain medical conditions such as high blood pressure, or in patients who are pregnant. Topical decongestant nasal sprays should be used for a maximum of three to five days, to prevent rebound congestion.

Antihistamines, which are found in many cold remedies, may alleviate symptoms such as a runny nose, but may also cause side-effects such as drowsiness and drying of the eyes, nose and mouth. Increased fluid intake and rest assist in alleviating symptoms. Some conditions, such as bronchiolitis, benefit from breathing warm and moistened air, so a humidifier may be used.

Small children may require mucus to be suctioned from their noses. Raising the patient’s head may improve the postnasal drip, and ease breathing. Antibiotics are not recommended to treat viral infections, but may be used if the illness becomes complicated with a bacterial infection. The production of yellow or green mucus does not always indicate the presence of bacterial infection, but should the mucus remain discoloured for more than five days, or indicate the presence of blood, the patient should be referred to a doctor.

The symptoms of most respiratory tract infections disappear within one or two weeks.

Prevention

Hand washing is an essential and effective way to prevent the spread of infection. Soap and water should be used to wash the hands, and the lather should be rubbed on the hands for 15-30 seconds. Hands should be rinsed well, and dried.

Hands should be washed before preparing food and eating, after coughing, sneezing and blowing the nose, and after using the toilet or playing with animals. Where possible, avoid direct contact with anyone who has an infection. Touching the eyes, nose, or mouth, of anyone with an infection, should also be avoided.
Vaccination can play a large part in the prevention of certain illnesses. The seasonal flu vaccine includes protection against the H1N1 virus.

The 2012 influenza vaccine for the southern hemisphere contains:
- A/California/7/2009 (H1N1)pdm09-like virus
- A/Perth/16/2009 (H3N2)-like virus
- B/Brisbane/60/2008-like virus.

Effective vaccines are available to prevent pneumonia. All young children should receive these vaccines as part of their routine immunisation schedule. High-risk adults should also receive a pneumococcal vaccine.

**When to seek help**

As most respiratory tract infections resolve within two weeks, patients do not need to seek medical attention initially.

However, the following symptoms may be severe, and require immediate attention:
- Shortness of breath
- Pressure or pain in the chest or stomach
- Confusion
- Uncontrollable vomiting
- Coughing up blood or bloody mucus
- Fever greater than 38.8°C
- Worsening of symptoms after getting better.

In children, the following symptoms require attention:
- Those with a blue or purplish skin tone, or who look very pale.
- When the child is so irritable that he or she does not want to be held.
- Those who have a fever with a rash.
- A child who does not wake easily.
- Infants who shed no tears when crying.

High-risk patients include children under the age of five years, and especially those under two years of age, pregnant women, people over the age of 65 years, and patients with certain conditions, such as asthma, heart disease and immune disorders.

**Conclusion**

Respiratory tract infections are common acute illnesses, ranging from mild sinus problems to life-threatening conditions. Most respiratory tract infections require symptomatic treatment only, but some may require further medication. Illness may be prevented with strict attention to hygiene, and following recommendations regarding vaccinations.

**Bibliography**