Perspective

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Common Cold in Children

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Abstract

The common cold, also known as Upper Respiratory Tract Infection (URI), is a viral illness of the upper respiratory tract that can also affect the lower respiratory tract. All adults are familiar with the symptom complex that includes rhinorrhea, nasal congestion, and a raw or scratchy throat. Colds are the most prevalent cause of human illness and are the leading cause of school and job absences. Children are particularly vulnerable since they have not yet developed protection to many viruses, have poor personal hygiene, and have frequent close contact with other children who are excreting virus.

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Introduction

Colds are prevalent because some of the viruses that cause them do not build long-term protection and some viruses have multiple serotypes. Respiratory Syncytial Virus (RSV), Parainfluenza Viruses (PIVs), and human coronaviruses are examples of cold viruses that do not create long-term protection. Rhinoviruses, adenoviruses, influenza viruses, and enteroviruses are cold viruses that have multiple serotypes yet elicit durable serotype-specific immunity following infection.

Rhinoviruses are the most common cause of URIs in infants and adults, with at least 100 serotypes. Rhinoviruses are responsible for at least half of all colds in adults.

RSV, human metapneumovirus, influenza virus, parainfluenza viruses, adenoviruses, echoviruses, and coxsackieviruses A and B are among the viruses that cause URIs. Human Bocavirus (HBoV), which was discovered in 2005, has been found in children with symptomatic URIs (>10 %), however it can also be found in asymptomatic children, leaving its significance in sickness uncertain.

Some viruses cause characteristic syndromes. RSV causes bronchiolitis in children under the age of two, influenza viruses cause febrile respiratory illness with severe lower respiratory tract involvement, adenoviruses cause pharyngoconjunctival fever, parainfluenza viruses cause croup in young children, HBoV causes wheezing, and enteroviruses cause a variety of illnesses, including aseptic meningitis and herpangina.

The typical yearly pandemic of colds begins in September in temperate climes in the northern hemisphere and continues uninterrupted until March. The town has been hit by multiple waves of different respiratory viruses, resulting in this long-term epidemic curveThe epidemic begins in September (when children return to school), with a strong increase in rhinovirus infections, followed by PIVs in October and November. During the winter, RSV and HBoVs circulate, and influenza virus infection peaks in the late winter. In the spring, there is a minor rebound of rhinovirus infections, bringing the pandemic to a close. Throughout the cold season, adenovirus infection is at an all-time high.

Colds are more common as you become older. Colds are most common among preschool children 1 to 5 years old, with 7.4 to 8.3 colds per year, according to a 10-year study of families with children who did not attend a daycare centre conducted in the 1970s. Respiratory symptoms were identified for 38% of person-weeks for children younger than 5 years and 20% for children and adult older than 5 years in a 52-week longitudinal study of 108 individuals in 26 households in Utah, which included diaries of illness and testing of weekly self-collected or family-collected anterior nares specimens by FilmArray, an automated Polymerase Chain Reaction (PCR) system for virus detection. 60% of respiratory diseases were linked to viral identification, while only around half of those detected viruses were linked to symptoms (especially rhinovirus and bocavirus).

Although the actual method of viral dissemination has not been determined, viral transmission happens predominantly in the home. Colds can be transferred by inhaling a small-particle (5 m in diameter) aerosol, or by large-particle (>10 m in diameter) droplets that infect by falling on nasal or conjunctival mucosa, or by direct hand-to-hand contact. For influenza virus and coronavirus, a small-particle aerosol is an effective mechanism of transmission, but not for RSV. Large-particle droplets or direct transmission are the most common ways for rhinoviruses to propagate.

Rhinoviruses can persist on human hands for up to 2 hours and on other surfaces for up to several days. Infected young adults frequently have rhinovirus on their hands, which can be easily transferred to the hands of uninfected people during brief contact, according to studies. When an uninfected person passes the virus from his or her hands to his or her nasal or conjunctival mucosa, infection occurs. Although sneezing and coughing are ineffective routes of rhinovirus transmission, there is some evidence that the virus can also be spread by aerosols produced by coughing, talking, and breathing. Infection is not caused by inoculating the oral mucosa with rhinovirus or RSV.

Nasal biopsy specimens from young people with natural and experimentally produced colds demonstrate intact nasal epithelium during symptomatic illness, indicating that symptoms of the common cold do not appear to be caused by mucosal loss. In situ hybridization of nasal biopsy specimens acquired after rhinovirus infection revealed that only a limited percentage of epithelial cells replicate the virus. When replicating in a cultivated monolayer of nasal epithelial cells, rhinovirus and coronavirus create no discernible cytopathic effect, whereas influenza virus A and adenovirus cause obvious harm, according to in vitro research.

The production of cytokines and other mediators from infected nasal epithelial cells, as well as an influx of Polymorphonuclear (PMNs) cells, appear to be the causes of common cold symptoms. One to two days after inoculation, nasal washings of volunteers experimentally infected with rhinovirus revealed a 100-fold rise in PMN content. The influx of PMNs occurs at the same time as the commencement of symptoms and is accompanied by a colourful nasal discharge. A higher quantity of PMNs can create a yellow or white nasal discharge, whereas PMN enzymatic activity (owing to myeloperoxidase and other enzymes) can cause a green nasal discharge.