
Strep Throat

Public Education

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Abstract

Strep throat is a bacterial infection caused by *Streptococcus pyogenes*, also known as group A streptococcus. It primarily affects the throat and tonsils, causing sore throat, difficulty swallowing, fever, and swollen lymph nodes. Strep throat is a common infection, particularly in children and adolescents, but it can occur at any age. Left untreated, strep throat can lead to complications such as rheumatic fever or kidney inflammation. This article offers a comprehensive overview of strep throat, covering its causes, symptoms, diagnosis, treatment, and prevention. It also provides insights into the genetic factors involved in susceptibility to the infection and discusses the role of antibiotics like penicillin (Penicillin V) and amoxicillin (Amoxil) in treatment. The goal is to provide clear and practical information for patients, caregivers, and

the general public to help them understand and manage strep throat effectively.

Introduction

Strep throat is one of the most common bacterial infections of the throat, affecting millions of people each year, particularly during the winter and early spring months. While many sore throats are caused by viruses, strep throat is different because it is caused by bacteria, specifically group A Streptococcus (*Streptococcus pyogenes*). This distinction is important because strep throat can be treated with antibiotics, which are not effective against viral infections. The infection is highly contagious and spreads easily through respiratory droplets when an infected person coughs, sneezes, or shares food and drinks. Strep throat primarily affects school-aged children and teenagers, but adults can also contract the infection.

Early recognition and treatment of strep throat are crucial to prevent potential complications, such as rheumatic fever, which can damage the heart valves, or post-streptococcal glomerulonephritis, a type of kidney inflammation. In this article, we will explore all aspects of strep throat, from its symptoms and diagnosis to treatment and prevention. Our aim is to provide a thorough understanding of this common infection and equip individuals with the knowledge they need to manage and prevent it (1-3).

What is Strep Throat?

Strep throat is a bacterial infection that affects the throat and tonsils. It is caused by group A streptococcus (*Streptococcus pyogenes*), a type of bacteria that is highly contagious. The infection is transmitted through airborne

droplets when an infected person sneezes, coughs, or talks, releasing the bacteria into the air. It can also spread through direct contact with contaminated surfaces or by sharing utensils, food, or drinks with someone who is infected.

Once the bacteria enter the body, they multiply in the throat and tonsils, causing inflammation and swelling. This leads to the characteristic symptoms of strep throat, which include sudden and severe sore throat, pain while swallowing, fever, and swollen lymph nodes in the neck. In some cases, white or yellow patches may appear on the tonsils or back of the throat. While strep throat is most common in children between the ages of 5 and 15, anyone can develop the infection.

Unlike viral sore throats, which usually resolve on their own, strep throat requires treatment with antibiotics to prevent complications. Without treatment, the bacteria can spread to other parts of the body and cause more serious health problems, such as rheumatic fever, which can damage the heart, or kidney inflammation. Early diagnosis and treatment with antibiotics are essential to reduce the risk of these complications and to prevent the spread of the infection to others.

Causes of Strep Throat

Strep throat is caused by infection with group A Streptococcus bacteria, specifically *Streptococcus pyogenes*. These bacteria are highly contagious and spread from person to person through respiratory droplets. When an infected person coughs, sneezes, or talks, small droplets containing the bacteria are released into the air and can be inhaled by others. The bacteria can also survive on

surfaces, so touching a contaminated object and then touching the mouth or nose can lead to infection.

Once inside the body, the bacteria attach to the tissues in the throat and tonsils, where they begin to multiply. The immune system responds to the infection by releasing inflammatory chemicals, leading to the symptoms of sore throat, redness, and swelling. In some cases, strep bacteria can release toxins that cause a more severe reaction, such as scarlet fever, which is characterized by a red rash and a high fever.

Certain factors increase the likelihood of developing strep throat, including close contact with someone who has the infection. Strep throat is especially common in crowded environments such as schools, daycare centers, and households. Children and adolescents are more susceptible to the infection due to their less developed immune systems, but adults can also contract strep throat, especially if they are frequently in contact with infected individuals.

Symptoms of Strep Throat

The symptoms of strep throat typically develop within two to five days after exposure to the bacteria. While some of the symptoms may resemble those of a viral sore throat, strep throat often has more pronounced and sudden symptoms. The hallmark symptom of strep throat is a sore throat that comes on quickly and is accompanied by pain when swallowing.

Other common symptoms of strep throat include: Red and swollen tonsils, often with white or yellow patches of pus

Small red spots (petechiae) on the roof of the mouth; Swollen and tender lymph nodes in the neck; Fever, often above 101°F (38.3°C); Headache; Nausea or vomiting, especially in younger children; Body aches and general malaise; and Loss of appetite.

Unlike viral infections, strep throat typically does not cause a cough, runny nose, or hoarseness. The absence of these symptoms can help distinguish strep throat from other types of sore throat, such as those caused by the common cold or flu.

In some cases, strep throat may be accompanied by a red, sandpaper-like rash known as scarlet fever. This rash usually begins on the chest and spreads to other parts of the body. While scarlet fever can be alarming, it is treated in the same way as strep throat, with antibiotics, and generally does not lead to long-term complications if treated promptly.

Diagnosis of Strep Throat

Diagnosing strep throat involves a combination of physical examination, symptom review, and laboratory testing. Because the symptoms of strep throat can resemble those of other illnesses, such as viral sore throats, it is important to confirm the presence of group A Streptococcus bacteria to ensure appropriate treatment.

During a physical examination, a healthcare provider will look for signs of strep throat, such as redness and swelling of the throat and tonsils, white or yellow patches on the tonsils, and swollen lymph nodes in the neck. If the provider suspects strep throat based on these findings, they may

order a rapid antigen test or a throat culture to confirm the diagnosis.

The rapid antigen test involves taking a swab from the back of the throat and testing it for the presence of group A *Streptococcus* bacteria. This test can provide results within minutes, making it a convenient option for diagnosing strep throat. However, rapid tests are not always 100% accurate, so if the test result is negative but strep throat is still suspected, the provider may order a throat culture.

A throat culture is a more definitive test that involves swabbing the throat and sending the sample to a laboratory for further analysis. While this test takes longer—usually 24 to 48 hours—it is more accurate and can confirm the presence of strep bacteria even when the rapid test is negative.

Treatment of Strep Throat

Strep throat is treated with antibiotics, which help eliminate the bacteria causing the infection and reduce the risk of complications. Antibiotic treatment is important not only for relieving symptoms but also for preventing the spread of the infection to others. The most commonly prescribed antibiotics for strep throat include penicillin (Penicillin V) and amoxicillin (Amoxil), both of which are effective at treating group A *Streptococcus* infections.

Penicillin is the first-choice antibiotic for treating strep throat because it is highly effective and has a low risk of causing side effects. It is typically taken as an oral tablet or liquid for 10 days. For individuals who are allergic to penicillin, alternative antibiotics such as azithromycin (Zithromax) or cephalexin (Keflex) may be prescribed.

In addition to antibiotics, over-the-counter pain relievers such as acetaminophen (Tylenol) or ibuprofen (Advil) can help relieve throat pain, reduce fever, and improve comfort. It is important to follow the healthcare provider's instructions for taking antibiotics and to complete the full course of treatment, even if symptoms improve before the medication is finished. Stopping antibiotics early can lead to a relapse of the infection and increase the risk of complications.

Resting, staying hydrated, and eating soft foods can also help ease the discomfort of strep throat while the antibiotics work. Most people begin to feel better within 24 to 48 hours of starting antibiotics, and the infection is typically no longer contagious after 24 hours of antibiotic treatment.

Prevention of Strep Throat

Preventing the spread of strep throat requires good hygiene practices, especially in environments where the infection is more likely to spread, such as schools and daycare centers. One of the most effective ways to prevent the spread of the bacteria is by regularly washing hands with soap and water, particularly after coughing, sneezing, or touching the face. Alcohol-based hand sanitizers can be used when soap and water are not available.

It is also important to avoid close contact with individuals who are infected with strep throat, as the bacteria can spread easily through respiratory droplets. People with strep throat should stay home from work, school, or other activities until they have been on antibiotics for at least 24 hours and are no longer contagious. Sharing personal

items, such as utensils, cups, or towels, with someone who has strep throat should be avoided to reduce the risk of infection.

Maintaining a healthy immune system through proper nutrition, regular exercise, and adequate sleep can help the body fight off infections, including strep throat. While there is no vaccine for strep throat, these preventive measures can significantly reduce the risk of contracting or spreading the infection.

Complications of Strep Throat

While strep throat is usually a mild infection that resolves with appropriate treatment, it can lead to serious complications if left untreated. One of the most concerning complications of untreated strep throat is rheumatic fever, a condition that can develop a few weeks after the initial infection. Rheumatic fever can cause inflammation in the heart, joints, skin, and brain, and in severe cases, it can lead to permanent damage to the heart valves (rheumatic heart disease).

Another potential complication of strep throat is post-streptococcal glomerulonephritis, a condition that affects the kidneys and can lead to swelling, high blood pressure, and blood in the urine. While this condition is rare, it can occur even if the strep throat infection has been treated, though treatment reduces the risk.

Other complications include abscesses around the tonsils (peritonsillar abscess), ear infections, sinus infections, and the spread of the bacteria to other parts of the body. Prompt treatment with antibiotics is essential to prevent these

complications and to ensure a full recovery from strep throat.

Genetic Factors and Strep Throat

While strep throat is primarily caused by bacterial infection, genetic factors may play a role in an individual's susceptibility to the infection and their immune response to it. Certain variations in genes related to the immune system, such as those involved in inflammation and the recognition of bacterial pathogens, may influence how a person's body responds to group A Streptococcus.

Researchers have identified specific genetic markers, such as those associated with the HLA (human leukocyte antigen) system, that may be linked to an increased risk of developing rheumatic fever following a strep throat infection. The HLA genes play a critical role in the immune system by helping the body recognize and respond to foreign invaders, such as bacteria and viruses. Variations in these genes may affect how the immune system responds to Streptococcus infections, leading to an overactive immune response that can cause complications.

Understanding the genetic factors involved in strep throat and its complications may help researchers develop better strategies for preventing and treating the infection, particularly in individuals who are at higher risk of developing complications like rheumatic fever.

Living with Strep Throat

For most people, strep throat is a temporary and treatable condition that resolves with antibiotic treatment. However, during the course of the infection, the symptoms can be uncomfortable and disruptive to daily life. Resting, staying hydrated, and following the prescribed treatment plan are essential for a quick recovery.

It is important to remember that strep throat is highly contagious, so individuals with the infection should take steps to avoid spreading it to others. Staying home from work or school, practicing good hand hygiene, and avoiding sharing personal items can help reduce the risk of transmitting the bacteria.

For individuals who develop complications from strep throat, such as rheumatic fever or kidney inflammation, ongoing medical care may be necessary to manage these conditions. Early detection and treatment of complications can improve outcomes and prevent long-term health problems.

Conclusion

Strep throat is a common bacterial infection that affects the throat and tonsils, causing sore throat, fever, and swollen lymph nodes. While the infection is usually mild and treatable with antibiotics, it can lead to serious complications if left untreated, such as rheumatic fever or kidney inflammation. Understanding the symptoms, causes, and treatment options for strep throat is essential for early diagnosis and effective management. By practicing good hygiene and seeking prompt medical care when symptoms arise, individuals can reduce the risk of

contracting or spreading the infection. With proper treatment, most people recover fully from strep throat and can return to their normal activities within a few days.

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