Fever Blisters and Canker Sores

Public Inquiries and Reports Section
Office of Planning, Evaluation
and Communication
National Institute of Dental Research
Bethesda, Maryland 20892

U.S. DEPARTMENT OF HEALTH
AND HUMAN SERVICES
Public Health Service
National Institutes of Health

NIH Publication No. 87-247
Revised 1987

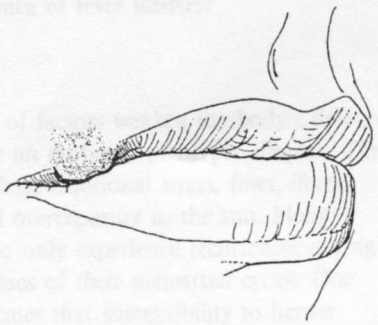
Fever Blisters and Canker Sores

Fever blisters and canker sores are two of the most common infections of the mouth, causing discomfort and annoyance to millions of Americans. The two disorders resemble each other and are often confused. Both disorders cause small sores to develop in the mouth. These sores usually heal within two weeks. Canker sores differ from fever blisters, however, by not being preceded by a blister. Canker sores are generally larger than fever blisters and several canker sores rarely merge to form one large sore, as do fever blisters. A final distinguishing trait between the two disorders is that canker sores usually occur on the movable parts of the mouth such as the tongue and the inside linings of the cheeks and lips, whereas fever blisters generally occur on the nonmovable sections of the mouth such as the gums and the roof of the mouth, or on the outside of the lips and nostrils.

Both canker sores and fever blisters have plagued mankind for thousands of years. Scientists working for the National Institute of Dental Research, one of the Federal Government's National Institutes of Health, are seeking ways to better control and ultimately prevent these and other oral infections. Recent research has furthered an understanding of the causes of these disorders and fostered improvements in their treatments.

Fever Blisters

In ancient Rome an outbreak of fever blisters prompted Emperor Tiberius to curb the spread of the epidemic by banning kissing in public ceremonies. Today, fever blisters (sometimes called cold sores) still occur in epidemic proportions. About 100 million episodes of recurrent fever blisters occur yearly in the United States alone, and 45 to 80 percent of all adults and children have experienced at least one bout with the blisters.



What causes fever blisters?

Fever blisters are caused by a contagious virus called herpes simplex. There are 2 types of herpes simplex viruses. Herpes simplex 1 primarily causes blister-like sores on the mouth, lips and face, although these blisters can be caused by herpes simplex 2, the virus that usually causes genital herpes.

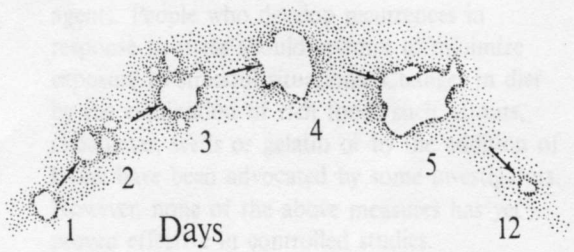
Herpes simplex is highly contagious when fever blisters are present, and the virus is frequently transmitted by kissing. Children often are initially infected with herpes by contact with their parents, siblings or other close relatives who have fever blisters. A child can also spread the virus by rubbing his or her cold sore and then touching other children. About 10 percent of oral herpes cases in adults are acquired by oral-genital sex with a person with active genital herpes.

Most people experience their first infection with herpes simplex 1 when they are less than 10 years of age. In these primary infections, the virus usually invades the moist membrane cells of the lips, mouth, or throat. The majority of persons infected have no symptoms, but about 15 percent develop many fluid-filled blisters inside and outside the mouth three to five days after they are exposed to herpes simplex 1. The blisters may be accompanied by fever, swollen neck glands, and general aches. Fever blisters tend to merge and then collapse.

Often a yellowish crust forms over the sores, which usually heal without scarring within 2 weeks.

The herpes virus, however, stays in the body. Once a person is infected with oral herpes, the virus remains in a nerve located near the cheekbone. The virus may stay permanently inactive in this site or occasionally may travel down the nerve to the skin surface where it causes a recurrence of fever blisters. Recurring blisters generally erupt at the outside edge of the lip or the edge of the nostril, and take almost as long to heal as the initial fever blisters.

Recurrent attacks of fever blisters are normally less severe than primary attacks and the frequency of recurrence appears to decline after a person reaches age 35, one study shows. Many people who experience recurring fever blisters feel itching, tingling or burning in the lip area 1 to 3 days before the fever blister occurs.



What causes a recurrence of fever blisters?

A number of factors weaken the body's defenses and trigger an outbreak of herpes simplex. These factors include emotional stress, fever, illness, injury, and overexposure to the sun. Many women also only experience recurrences during certain phases of their menstrual cycles. One study indicates that susceptibility to herpes recurrences is inherited. Research is currently underway to uncover how exactly "trigger" factors interact with the immune system and the virus to prompt a recurrence of fever blisters.

What are the treatments for fever blisters?

There currently is no cure for recurrent fever blisters. A number of medications can relieve some of the pain and discomfort associated with the sores, however, including numbing ointments applied to the blisters, antibiotics that control any occurring secondary infections and ointments that soften the crusts of the sores.

Is there a vaccine for fever blisters?

There currently is no vaccine for herpes simplex available to the public, although several research laboratories are working on this approach to preventing fever blisters. A team of investigators at the National Institute of Dental Research and the National Institute of Allergy and Infectious Diseases have developed an experimental vaccine that holds promise for preventing initial infection with herpes simplex virus. In animal tests, the vaccine has protected animals against an initial herpes infection and prevented the virus from establishing itself in the nerves.

Although these findings are encouraging, further animal studies on the safety and effectiveness of the vaccine are being performed so that a decision can be made on whether to test it on humans. The vaccine would only be useful for people who have never contracted herpes simplex.

What the patient can do?

If fever blisters erupt, they should be kept clean and dry to prevent bacterial infections. A soft, bland diet is recommended to avoid irritating the sores and surrounding sensitive areas. Care should be taken to refrain from touching the sores and spreading the virus to new sites, such as the eyes and genitals. To prevent infecting others, kissing should be avoided as well as touching the sores and then touching others.

Little information exists on ways to prevent recurrences of fever blisters. People who develop fever blisters after sun exposure might try to minimize sun exposure by avoidance or by the use of sun shields and/or hats or sun blocking

agents. People who develop recurrences in response to stress should attempt to minimize exposure to stressful situations. Changes in diet by the elimination of rich foods such as nuts, chocolates, seeds or gelatin or by the addition of lysine have been advocated by some investigators. However, none of the above measures has yet proven effective in controlled studies.

Research on fever blisters

Research on fever blisters is extensive. Several laboratories are developing and testing new antiviral drugs tailored to hamper or prevent blister outbreaks. Investigators are also trying to develop ointments that enable antiviral drugs to penetrate the skin more effectively.

Acyclovir is a recently developed antiviral drug that in clinical studies lessened the symptoms and frequency of fever blister recurrences for some patients. This drug prevents the herpes virus from multiplying and is effective when taken in pill form prior to an outbreak of the virus. One study showed that during the 3-month period when they took 4 acyclovir pills daily, the majority of patients had no recurrences of fever blisters compared to having an average of one recurrence a month prior to taking the drug. Acyclovir creams applied to blisters or areas of the lip that tingle or itch prior to a blister outbreak were also tested but these topical applications were shown to be ineffective. The long-term effects of daily oral doses of acyclovir are not known, nor are the effects the drug might have on an unborn child. Acyclovir is approved for use as a treatment for genital herpes and the U.S. Food and Drug Administration is currently considering approving the drug for use as a treatment for oral herpes.

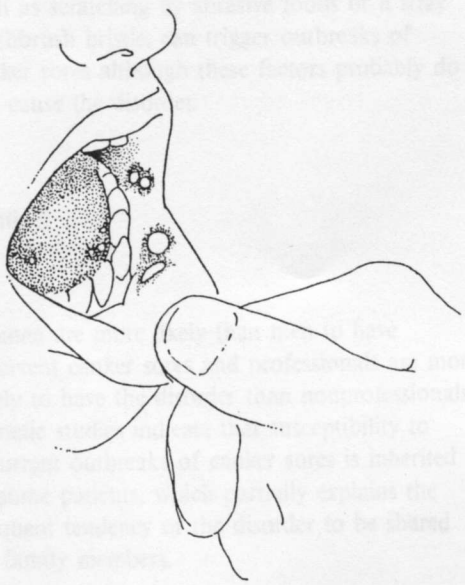
New types of therapies may evolve from the basic research scientists are conducting on how the immune system interacts with herpes simplex viruses. The immune system generates a wide array of cells and compounds when it defends the body from infections and researchers are trying to uncover which components prevent recurrent attacks of oral herpes. One of these components, the antiviral compound called interferon, appears to play a role in preventing recurrent herpes infections, studies show. Interferon is currently being tested on patients to ascertain its effectiveness in the treatment of first episodes of oral herpes as well as the prevention of recurrent fever blisters.

Herpes treatments may also be improved by the information gleaned from studies on the precise form and location of the inactive herpes virus in nerve cells. This information will enable investigators to tailor antiviral drugs to effectively attack herpes virus in nerves.

Researchers are also trying to uncover how factors such as emotional stress interact with the immune system to trigger a recurrence of fever blisters. Included in this research are studies on how hormones released by the brain during periods of stress influence immune system functions. In addition, work in several laboratories continues on developing and testing vaccines for herpes simplex 1.

Canker Sores

Recurrent canker sores are one of the most common inflammatory conditions of the mouth, afflicting about 20 percent of the general population. The medical terms for canker sores are aphthous stomatitis or aphthae.



Canker sores begin as small oval or round reddish swellings, usually on the movable parts of the mouth such as the tongue and the inside linings of the lips and cheeks. These swellings usually rupture within a day, are covered by a thin white or yellow membrane, and become edged by a red halo. The size of the sores varies from being an eighth of an inch wide in minor infections to an inch and a quarter wide in more severe cases. Fever is rare and there rarely is an association of canker sores with other diseases. Usually a person will only experience a single or a few canker sores at a time. These sores generally heal within 2 weeks. Severe forms of the sores may leave scars.

Most people experience their first bout with canker sores when they are between the ages of 10 and 20 although children as young as 2 years of age may develop the condition. The frequency of canker sore recurrence varies considerably. Some people may only experience one or two episodes a year, whereas others may have a continuous series of canker sores. Most people experience tingling or pain in the area of the mouth where canker sores later develop.

What causes canker sores?

It is not known what causes canker sores in all patients although more than one cause is likely even for individual patients. Attempts to find bacteria or viruses linked with the disease have not proven fruitful although an allergy to a type of bacteria commonly found in the mouth may cause some people to develop canker sores. The sores might also be an allergic reaction to certain foods eaten. In addition, there is research that suggests canker sores may be caused by a faulty immune system that uses the body's defenses against disease to attack and destroy the normal cells of the mouth or tongue.

British studies indicate that canker sores in about 20 percent of all patients are partially caused by nutritional deficiencies, especially a lack of vitamin B12, folic acid and iron. Similar studies performed in the United States, however, have not confirmed these findings. In a small percentage of patients canker sores occur in conjunction with gastrointestinal problems, such as an inability to digest certain cereals, and thus appear to be part of a generalized disorder of the digestive tract.

Female sex hormones apparently play a role in causing canker sores. Many women only have bouts of canker sores during certain phases of

their menstrual cycles. The majority of women, in addition, experience improvement or remission of their canker sores during pregnancy. In clinical studies, researchers have also used hormone therapy to successfully treat some women.

Both emotional stress and injury to the mouth, such as scratching by abrasive foods or a stray toothbrush bristle, can trigger outbreaks of canker sores although these factors probably do not cause the disorder.

Who is susceptible?

Women are more likely than men to have recurrent canker sores and professionals are more likely to have the disorder than nonprofessionals. Genetic studies indicate that susceptibility to recurrent outbreaks of canker sores is inherited in some patients, which partially explains the frequent tendency of the disorder to be shared by family members.

Treatment

Most doctors recommend that patients who have continual or frequently recurring bouts of canker sores undergo blood and allergy tests to determine if their sores are caused by a nutritional deficiency, an allergy, or some other correctable cause. Vitamin and other nutrient supplements often prevent recurrences or reduce the severity of canker sores in patients with a nutritional deficiency. Avoidance of foods a patient is allergic to can also reduce the frequency of canker sore recurrences.

There are a number of treatments that reduce the pain and duration of canker sores for patients whose outbreaks cannot be prevented. These treatments include numbing preparations such as xylocaine that are applied on the sores when a patient has only a few, and anti-inflammatory steroid mouthwashes or gels for patients with several sores. Mouthwashes containing the antibiotic tetracycline may reduce the unpleasant symptoms of canker sores and speed healing by preventing complicating bacterial infections in the sores. Clinical studies at the National Institute of Dental Research have shown that rinsing the mouth with tetracycline several times a day usually relieves pain in 24 hours and allows complete healing in 5 to 7 days. The U.S. Food and Drug Administration warns, however, that tetracyclines administered to pregnant women and young children can permanently stain teeth. Steroid and tetracycline treatments both require a prescription and care of a physician or dentist.

Patients with severe recurrent canker sores may need to take steroid or other immuno-suppressant drugs orally. These potent drugs may cause many undesirable side effects, however, and should be used only under the close supervision of a physician or dentist.

What the patient can do?

Patients with outbreaks of canker sores should avoid abrasive foods such as potato chips that can stick in the cheek or gum and further aggravate the sores. Care should be taken when brushing the teeth so as not to stab the sores with a toothbrush bristle. Acid and spicy foods should also be avoided. Canker sores are not contagious so patients do not have to worry about transmitting the disease to people with whom they are in contact.

Research on canker sores

Much of the research on canker sores centers on trying to identify malfunctions in patients' immune systems that render them susceptible to recurrent bouts of canker sores. By analyzing the blood of patients with and without recurrent canker sores, scientists have discovered several differences in immune function between the two patient groups. Whether these differences in immune function cause canker sores is not known yet.

Research on canker sores also includes developing and testing new drugs designed to treat patients with canker sores. Most of the drugs being developed alter the patient's immune function. Although some of these compounds appear to effectively treat some patients, the data is still inconclusive. Until these drugs are definitively shown to be both safe and effective, they will not be available for general use.