

What is allergic fungal sinusitis (AFS)?

AFS is a disease in which fungal debris and mucus build up in the sinuses (the air-filled cavities in the skull, shown below).



Scientists believe that it is caused by an allergic reaction to parts of fungi that are sometimes found in the air. When these are inhaled, they activate the body's immune system. This causes swelling, which blocks the sinuses. Blocked sinuses are an excellent environment for fungi to grow in and this growth triggers more swelling. In this way a self-propagating cycle is formed.

Which fungi cause AFS?

Many fungi can cause AFS, but the majority of AFS patients are allergic to *Aspergillus*.

Who gets AFS?

We still do not understand a lot about this condition but the current knowledge is that although almost everybody has fungus in the nose, only a minority develop AFS. The majority of patients with a runny nose don't have AFS.

Anyone can develop AFS but people who have hay-fever or asthma and are in their early 20s are most at risk. Some scientists believe that AFS is more common in countries that are hot and humid.

“ Louise, aged 23, has always suffered from a runny nose. Last year she went to her doctor complaining that this was getting worse and she was producing solid crusts from her nose. Louise had suffered from asthma as a child. Louise's doctor performed some blood tests and sent her for a CT scan. Some samples were taken from her nose and examined under the microscope. One month after she first went to her doctor Louise was told that she had AFS. Her doctor explained the disease and referred her to a specialist for treatment. ”

What are the symptoms of AFS?

In people with a normal immune system, AFS is a relatively mild disease. Patients suffer from a runny, blocked nose which may make breathing difficult. Antihistamines will not relieve this. Many also suffer from headaches, facial pain and swelling, and a cough. Some people complain of producing an almost solid nasal discharge which may be green or brown in colour. Patients may occasionally suffer from bad breath due to the build-up of fungus. There may be sensitivity to sound, with ear canal and hearing difficulties. Balance problems may also occur. Mucus may slide from the sinuses down the back of the throat into the lungs, causing lung problems (post-nasal drip).

In a minority of patients there is expansion of the bone of the nose and sinuses, a rare occurrence which can push the eye forward or cause hypertelorism (increased distance between the eyes due to expansion of the nasal bones). These changes may be noticed by others.

The symptoms of AFS become gradually worse with time unless they are treated.

A guide for patients

Allergic Fungal Sinusitis



Aspergillus fumigatus

Nothing contained in this leaflet is intended to be any form of medical advice and must not be taken, or relied upon, as such. Individuals must seek all such advice personally in relation to their particular circumstances.

How is AFS diagnosed?

Several tests are used to diagnose AFS:

- Blood tests may show increased levels of antibody.
- A skin test may reveal allergies to certain fungi.
- An X-ray or CT scan of the head may show mucus and fungus in the sinuses, and nasal polyps occur in up to 85% of patients.
- Surgery may reveal a build-up of thick, brown-green mucus or fungus in the sinuses.
- Examination of samples taken during surgery may show characteristic fungus under the microscope.

GPs will use some of these tests to decide if a patient has AFS. If so, he or she will be referred to a specialist doctor for treatment.

“ Mark, aged 19, is known to suffer from AFS and had surgical treatment to relieve his symptoms 2 years ago. Mark recently presented to his doctor complaining that he felt his airways were becoming more and more obstructed and that his right eyelid was drooping. The doctor also noticed that Mark’s eyes and nose looked slightly asymmetrical. Tests showed that these problems were due to a recurrence of Mark’s AFS. After undergoing more surgery to remove built-up mucus from his sinuses and taking steroid tablets, Mark felt a lot better. He regularly sees his doctor to review his AFS. ”

How is AFS treated?

The aim of AFS treatment is to remove fungus and mucus from the sinuses and prevent it from coming back. Both surgery and drugs are used to do this.

- All patients with AFS should be offered surgery to clear out built-up fungus and mucus from their sinuses. Patients with polyps can also have these removed. Surgery is performed using a small tube (an endoscope connected to a camera) inserted through the nostril. There is a video of this at http://www.aspergillus.org.uk/secure/image_library/movies/fungalballrem.htm.
- Drug treatment involves using corticosteroid tablets and antifungal drugs, such as Itraconazole. The steroid tablets are used to reduce the inflammation. Antifungal drugs are used to prevent fungus from growing. Itraconazole may be taken in pill form, or rinsed by syringe directly into the sinuses as a liquid. In severe cases the rinse may be Amphotericin B.
- Antibiotics may be required to treat secondary bacterial infections.
- A saline rinse is a treatment which may be effective and can be administered by the patient.
- Less severe cases may respond well to regular steam inhalations which relieve the blockage and discomfort.

Patients should see their GPs regularly for at least the first year after surgery to check that their disease has not come back.

New treatments for AFS, known as immunotherapies, are being developed. They involve injecting very small amounts of dead fungus into a patient after they have had surgery to clear their sinuses. Research so far suggests that they are a safe and effective treatment.

What are the complications of AFS?

In patients with a normal immune system, the main complications of AFS are:

- Gradual airway obstruction.
- Development of nasal polyps.
- Lack of sense of smell is common.
- Lung infections caused by post-nasal drip.

Fungal sinus conditions which are *not* AFS

- Sinus mycetoma (a ball of fungus) may form in a few patients who have AFS or in those who do not have detectable antibodies to aspergillus. These patients may report that they blow a gravel-like material from their nose. Treatment may involve surgery and antifungal drugs.
- Invasive sinusitis may develop in immunocompromised patients who do not necessarily have a prior diagnosis or suggestive symptoms of AFS. Infection of the skull and nervous system with Aspergillus can occur causing fever, facial pain and headaches. If this happens the patient will be disorientated and feel very sick, with a fever, cough and headache. They may also suffer from other symptoms such as visual loss, because of fungus deposits pressing upon important nerves and blood clots within the brain. Urgent treatment is then required to avoid long-term consequences: this may involve laser surgery and IV antifungals, such as Caspofungin. Approximately half of these patients will die despite treatment.

What is the outlook for an AFS patient?



Most patients with AFS achieve excellent relief of their symptoms following treatment.

Unfortunately most of these patients will suffer from a recurrence of their disease in the years after treatment. This risk can be reduced by continuing to take steroid tablets for at least two months after surgery and further relief can be obtained by treating them again.

The immunotherapy treatments that are being developed at present also appear to reduce recurrence of AFS.

Where can I find more information?

By telephone: NHS Direct: 0845 4647

On the internet: www.aspergillus.org.uk
www.aspergillustrust.org
www.sinuses.com/fungal.htm
www.niaid.nih.gov/factsheets/sinusitis.htm
www.emedicine.com/ent/topics510.htm

By e-mail: info@aspergillustrust.org
aspergillus@manchester.ac.uk
wtichenor@sinuses.com



Medical knowledge and opinion varies according to the extent and availability of research and differing assessments of such research by different practitioners.

Whilst the information contained in this leaflet has been compiled by the Aspergillus Trust from sources believed to be reliable, the Trust cannot guarantee the accuracy or completeness of such information and cannot accept any responsibility for any use of such information.

Grateful thanks are given to Dr Ali Murad, winner of the fourth Aspergillus Trust competition for medical students, for his help in compiling this leaflet.

Many thanks also go to Mr Hesham Saleh FRCS (ORL-HNS), Consultant Rhinologist/Facial Plastic Surgeon of Charing Cross and the Royal Brompton Hospitals, London Honorary Senior Lecturer, Imperial College, London.

Sincerest thanks also to Mr M Bland for continued financial support of our competition.

© Aspergillus Trust February 2008.

Registered charity No: 1096281