Topical steroids for children with asthma

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Introduction

Steroids are the most effective preventive medication for the treatment of asthma in children. The inhalation of steroids helps asthmatic children lead normal lives and has no relevant side effects in recommended dose. Therefore, pediatricians recommend that children with regular symptoms of asthma should be treated with inhaled steroids.

Many parents don't want to give their children steroids because they are afraid of side effects. The result can be that the asthma is inadequately treated, which may reduce lung function and worsens the child's quality of life.

This booklet explains steroids and steroid treatments.

What is asthma?

Asthma is a disease of the lungs that causes attacks during which the air passages constrict and breathing becomes difficult. In severe attacks, breathing is labored, wheezy and whistling. Milder forms of asthma may show up in other ways: for example, persistent coughing which is often worst at night. It is also typical for asthmatic children to become abnormally breathless when they exert themselves.

The lungs are made up of air tubes that divide themselves into progressively smaller air tubes and, finally, end in air sacs. Here, fresh oxygen from the air is exchanged for carbon dioxide from the blood. On the inside, the air tubes are lined by mucus membranes and, on the outside, they are surrounded by muscles. During an asthma attack, these muscles tighten (cramp) around the air tubes, causing them to constrict. This cramping can be treated effectively with muscle-relaxant drugs such as *Ventolin, Albuterol and Airomir.*

Asthma is characterized by chronic inflammation of the air tubes. This inflammation is not caused by bacteria or virus, and cannot be cured by antibiotics. The cause of asthmatic inflammation is unknown, but we do know that it can be made worse by common colds, allergies and by irritants in the air, such as tobacco smoke. This inflammation irritates the airways and makes them highly sensitive. The mucus membrane inside the inflamed air tubes swells and produces a great deal of mucus – further contributing to the constriction and closing of the air passages. This chronic inflammation of the air tubes is damaging to the lungs and is treated most effectively with steroids.

What are steroids?

Steroids include various vital hormones which are produced by the adrenal cortex. One of these natural hormones is cortisone, which is effective against asthma. When we talk about steroids and adrenal hormones for the treatment of asthma, this is what we are referring to – namely medications which work like the body's own cortisone. These medications are completely different from sex hormones and anabolic steroids.

Two types of steroids are used to treat asthma: topical steroids and systemic steroids.

Topical steroids (such as Flixotide, Becotide and Pulmicort) are inhaled into the lungs where they work locally and very effectively. Outside the lungs, they are rapidly broken down by the body, so that their impact is minimal.

Systemic steroids are given by injection or in the form of pills and, thus, affect the entire body. These are very effective against acute or chronic severe asthma, but they do carry some risk of side effects if they are given over long periods – that is, for months. Common types are Prednisolone and SoluMedrol.

Systemic steroids have been used for the treatment of asthma since the beginning of the 1950's – and topical steroids, since the 1970's – so we have a great deal of experience with these treatments.

How do steroids work?

Steroids suppress the chronic asthmatic inflammation of the air tubes. When this inflammation is checked, asthma symptoms disappear. The steroids don't cure the illness; they simply control the unhealthy inflamed condition in the air tubes. As long as the child is receiving topical steroids, his illness remains under control – but it will reappear as soon as the medicine is stopped.

Steroids are preventive drugs. They do not relax the muscles, so they don't open up the air passages instantaneously. Since the child cannot feel any immediate effect, it takes a lot of discipline to continue the treatment. But the prevention of asthma with steroids is like the prevention of cavities with tooth brushing. The illness can only be prevented with regular, daily treatment. So the child must also be given steroids in good periods, when he has no symptoms.

The effectiveness of steroids doesn't diminish over time even when they are used for many years, and there is no habituation, which would demand higher and higher doses. The body does not 'get used to' or become dependent on topical steroids, so you can stop taking them at any time with no need to reduce the dose gradually.

Steroids also reduce allergic reactions, so that asthmatic children can better tolerate the substances they are allergic to. Naturally, this doesn't mean that the child's allergies should be ignored, but it does mean that the child has less problems coping with the allergic reactions that, despite our best efforts, cannot be avoided in everyday life.

How much medicine does the child need?

Both muscle relaxants (e.g., *Albuterol, Ventolin and Airomir*) and topical *steroids* (e.g., Flixotide and Pulmicort) can be used to treat asthma. Muscle relaxants may be enough to treat mild cases of asthma but, if the child has regular symptoms, they ought to be supplemented with a topical steroid.

When asthma symptoms recur seasonally, it is wise to try to prevent them by beginning – or increasing – the dose of topical steroids before the symptoms show up. We can often predict when the child's asthma is going to get worse. Many patients always get attacks at the same time each year. For example, they may react to pollens in the summer, moulds in the autumn, or to dust mites and bad colds in the winter.

At the first sign that the child's condition is becoming worse, it is generally recommended *that you immediately quadruple the dose of topical steroid*. It is important to continue this increased dose even after the symptoms have disappeared because the illness remains active after the symptoms have gone. *You can return to the normal dose 2-4 weeks after the attack is over.*

The therapeutic effects of topical steroids build up slowly (over days or weeks) and disappear again just as slowly. Regulating the dose may, thus, seem difficult – and many parents are tempted to increase and decrease it too frequently. It is important to recognize the delayed effect of steroid treatment. Topical steroids should be steered like you'd steer a super tanker: remember that after you change course, it still takes the ship a long time to actually turn.

How are topical steroids inhaled?

Topical steroids are inhaled into the lungs. There are 2 good systems for inhalation – namely powder inhalers and sprays with spacers (air containers).

Powder inhalers, such as *Diskos* and *Turbuhaler* are very effective and easy to use for school children. In order to get the full effect from powder inhalers, it's important that:

- The mouthpiece must be placed behind the child's teeth.
- Make sure that the child inhales deeply and strongly.
- Then the child should rinse his mouth and spit out any medicine that remains in the mouth.

Sprays with spacers are better to use for smaller children. It is important to remember to:

- Shake the spray vigorously before spraying the medicine into the spacer.
- Make sure that the spacer is placed carefully over the child's mouth before the sprayer is actuated because, otherwise, the medicine droplets can easily fall out.
- Remember to spray only 1 puff of medicine into the spacer at the time.
- Then let the child breathe normally from the spacer about 10 times before you give the next puff.

What are the side effects of steroids?

About *1% of children using topical steroids develop thrush* – the same sort that infants often develop spontaneously. Thrush appears as small white patches inside the mouth, usually without discomfort. The risk is lower if the child rinses his mouth after every inhalation. If the mouth infection doesn't disappear, it is treated by rinsing with a mouthwash mixture.

Hoarseness occurs less frequently. But, if it does, it is not a sign of damage to the vocal cords, and it disappears again when the dose is reduced.

The use of topical steroids in recommended doses does not cause other side effects.

With the use of very high doses – beyond those recommended – there is a risk of mild steroid effects on the body, which can slow down the child's growth. Usually, this is temporary and the child catches up again with a growth spurt during the healthier periods. Untreated severe asthma can, in itself, slow down a child's growth – so we sometimes see children whose growth rate increases when they receive steroid treatments that bring severe asthma under control. In any case, it is wise for the doctor to follow the growth pattern for the child's height.

Topical steroids does not influence weight gain.

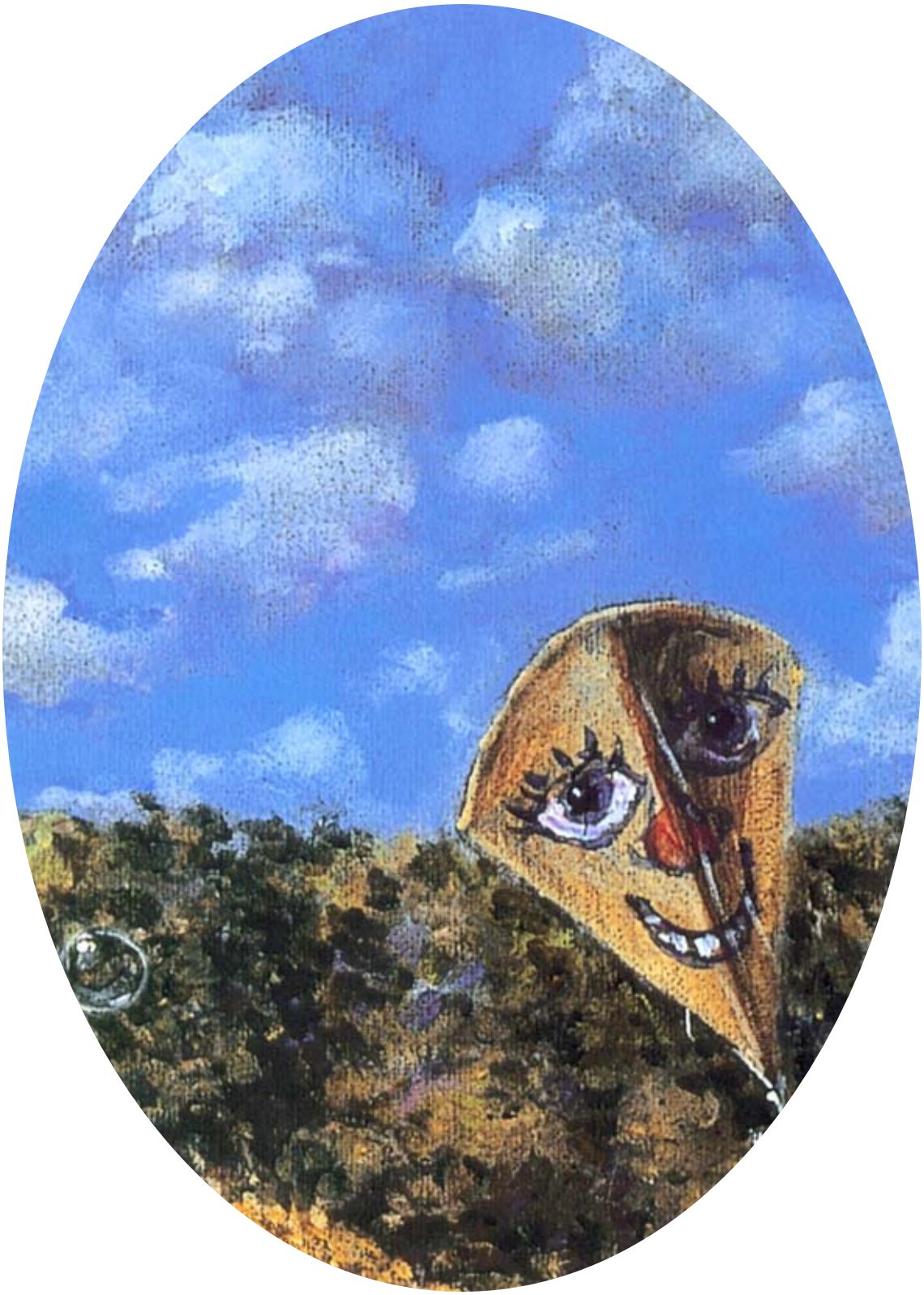
What happens when asthma is not treated?

The side effects of steroids are more feared than there is any good reason for. It is, naturally, important to watch out for side effects. This is true of all kinds of medications. In fact, all drugs have side effects if they are given in overly large doses. With intelligent use of these medications, we can easily find the right balance between the risk of side effects and the problems of under-treated asthma.

Every day many children are admitted to hospital with severe attacks of asthma because of inadequate treatment at home. Many of them could have avoided hospitalization if they had received proper preventive treatment with topical steroids.

If inadequately treated, asthma can have serious adverse effects on a child's quality of life. For example, children sleep poorly during periods when they are having attacks, so they are tired and out of sorts. This can have an impact on their studies. Under-treatment often results in difficulties with strenuous exercise as well. This makes children avoid physical activities such as sports and, in the worst cases, their physical condition and coordination may suffer. Under-treated asthma can also lead to recurrent pneumonia. Some studies suggest that inadequate treatment of asthma leads to irreversible loss of lung function.

On the other hand, we never see children with serious side effects from treatment with topical steroids. There is, therefore, no question that the side effects of untreated asthma are far worse than those of topical steroids.



How do we regulate the treatment?

Children are often unaware of, or ignore, their symptoms. It is important, therefore, to *teach the child to recognize his symptoms.* The fact is, that lung function has already fallen significantly – often by as much as $^1/_3$ – before the child begins to notice difficulty in breathing. Asthma symptoms must, therefore, always be treated.

It may be useful to *measure lung function with a peak-flow meter every morning and evening.*

The measurements are entered as a curve in an asthma logbook. The curve may reveal the signs of an impending attack before symptoms are felt and may be a valuable tool for controlling the disease.

It is important to start by determining the child's own best exhalation ability. *If his ability to exhale falls by more than 20%,* this is cause for concern. *Large swings* are also a sign of worsening asthma. The peak-flow meter may, in this way, be a help in regulating treatment with the aim of preventing asthma from worsening. This is the primary goal of good treatment.