

Breath of Fresh Air

Volume 7, No. 3

Information, news and advice for improving asthma well-being

Winter 2003

Nocturnal asthma

Perhaps this scenario sounds familiar. You (or your child) go to bed feeling well. Maybe during the day you had some mild asthma symptoms, used your inhaler in the evening, and fell asleep that night without difficulty. But at 3 or 4 in the morning, you suddenly wake from your sleep short of breath. You feel a tight band squeezing your chest. A short, dry cough emanates from high in your throat. You sit up and look for your quick-acting bronchodilator inhaler. Where did you put it? Did you leave it under your pillow, as you routinely do, or on top of the bedside table? You know that you will feel much better if you can use your medication to open the breathing tubes quickly.

This episode is an example of nocturnal asthma, a common event for many people with asthma. In one study of more than 1000 children with mild-moderate asthma, over a 1-month period of observation, nighttime awakenings due to asthma occurred at least once in 35% of the children (who were being treated with bronchodilator medication only during this period). Nighttime awakenings are even more common in adults and in persons with severe asthma.

Biorhythms to our breathing

In asthma lung function varies over time. The bronchial tubes may narrow during the day, causing daytime symptoms of asthma. Why shouldn't they narrow at night, causing nocturnal asthma? While it is true that one should not necessarily expect sleep to protect against bronchial tube narrowing, there does seem to be something special about the early morning hours that predisposes to symptoms at that time. If you could measure lung function around the clock, you would find that airways are commonly at their narrowest near 4:00 a.m. There is a natural daily biorhythm that puts us at greatest risk for asthmatic symptoms around this early morning hour. Our cortisol and adrenaline

blood levels are at their lowest levels then; histamine levels tend to be high. In patients prone to develop nocturnal asthma, the flux of inflammatory cells into their airways tends to be greatest around that time.

More mundane explanations may account for your waking at night with asthma. Perhaps it is that pet cat or dog, curled up inches from your head, that triggers an allergic reaction at night. Perhaps it is the accumulation of dust mite allergens in your pillow and mattress, spread into the air

every time you or your bedmate turn over in bed. Perhaps the nasal mucus from your allergic rhinitis tends to drip into the back of your throat while you sleep on your back, or perhaps stomach acid tends to regurgitate up into your chest when you lie down shortly after a big meal. Or perhaps the weight of all those extra pounds around your midriff, pushing up on your breathing muscles (the diaphragm) when you lie supine, compromises your breathing just enough to cause you symptoms overnight. In addition, the quick-acting bronchodilator that you took earlier in the evening exerts its beneficial effects for only a few hours. It is no longer acting on your bronchial tubes at 4:00 a.m.

A warning sign?

For many people, starting to wake at night due to asthma is a warning sign that your asthma is becoming less well controlled. It is evidence that the bronchial tubes are becoming more twitchy, that the system of bronchial tubes is becoming more unstable, with a greater tendency to constrict.

If you are having nighttime awakenings from your asthma, it is a useful clue – for you and for your doctor – that it is time to: 1) do some detective work into the possible causes of your

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News About Asthma

New CFC-Free Inhaler

The latest delivery device for asthma medication that does not use chlorofluorocarbons (CFCs) as propellant is Ventolin-HFA[®]. HFA refers to an alternative propellant, hydrofluoroalkane, that, unlike CFCs, does not contribute to destruction of the protective layer of ozone high in the earth's atmosphere. Ventolin-HFA[®] delivers the same amount of the quick-acting bronchodilator, albuterol, as the traditional Ventolin[®] inhaler and is equally effective. CFC-free delivery systems are listed below:

Category	Generic Name	Brand Name	Type of Device
Short-acting bronchodilator	Albuterol	Proventil-HFA Ventolin-HFA	MDI with HFA MDI with HFA
Long-acting bronchodilator	Formoterol	Foradil Aerolizer	DPI
	Salmeterol	Serevent Diskus Advair* Diskus	DPI DPI
Corticosteroid	Beclomethasone	QVAR	MDI with HFA
	Budesonide	Pulmicort Turbuhaler	DPI
	Fluticasone	Flovent Diskhaler Advair* Diskus	DPI DPI

MDI with HFA = metered-dose inhaler with hydrofluoroalkane propellant

DPI = dry-powder inhaler

*Advair Diskus contains the long-acting bronchodilator, salmeterol, and the corticosteroid, fluticasone.

Asthma Gene

Researchers in England and the United States have reported their successful identification of a gene closely associated with asthma. They searched the genes of 460 families in which at least two siblings had asthma. They found that the siblings with asthma had a specific mutation in a gene on chromosome 20 more often than chance alone could explain. The gene is called ADAM33; and it is likely that the protein made by this gene in some way contributes to the development of asthma.

ADAM33 is just one of what are likely to be many different genes that predispose to asthma. It is not one that scientists would have predicted. It regulates production of a protein along the walls of airways, one that can influence the function of structural cells in airway walls, including bronchial muscles. Perhaps some day it will be used in the diagnosis of asthma, and it may lead to new discoveries for the treatment of asthma.

Most importantly, this research demonstrates that a fruitful avenue of asthma research is to study the genes of people with asthma and to compare these genes with those of people who do not have asthma. By so doing, scientists can discover genetic variants unique to asthma, the proteins made by these genes, how they function, and how they might contribute to the disease that we recognize as asthma.

Breath of Fresh Air

Editor-in-chief

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Asthma Q & A

Q: How can I keep from getting sinus infections? I have allergies to trees, grasses, mold, and cockroaches. I get as many as 3 or 4 sinus infections each year. As I write this letter, I have another sinus infection. My head feels like a balloon blown up too much, and I have trouble breathing because my nose is congested. I have tried everything: hot showers, chicken soup, and putting my head over boiling water with a towel as a tent. My medications include an antihistamine, guaifenesin, and nasal saline spray. Right now I am taking a nasal steroid spray and an antibiotic.

— *Mary Kane, South Boston.*

A: Recurrent sinusitis is a difficult medical problem. Germs travel up into the sinus cavities and then are hard to eradicate, often because drainage of infected secretions from the sinuses is blocked. The sinuses drain through passageways that empty into the back of the nose. Swelling of the membranes of the nose – such as may occur during respiratory infections (head colds) and with allergies of the nose (allergic rhinitis) – can block these passageways. Pressure builds up within the sinuses, causing headache and facial pain.

The general approach to treating bacterial sinusitis is two-pronged, as you are doing: treat the infection with antibiotics and promote drainage of secretions from the sinuses. The latter can be achieved in a variety of ways, including oral or nasal antihistamines; oral or nasal decongestants (such as pseudoephedrine [Sudafed®] and oxymetazoline [Afrin®]; topical steroid sprays; the non-steroidal, anti-inflammatory nasal spray, cromolyn [Intal®]; and a nasal spray that blocks some of the nerve stimulation to the nasal membranes, ipratropium (Atrovent®). Some of these treatments are meant only for short-term use (especially oxymetazoline [Afrin®]), others can be used in allergy season only or year-round if necessary. Guaifenesin is meant to thin the mucus, helping to promote its clearance.

You can also be pro-active by avoiding stimuli that cause swelling of the nasal membranes, including cigarette smoke and allergic triggers. Irrigation of the nasal passageways with salt water (saline) helps in two important ways: it rinses out allergens, air pollutants, and germs from the nose, and it helps to keep the membranes lining the nose from becoming uncomfortably dry. You can make your own saline

solution if you want. Simply add one heaping teaspoon of pure (kosher, pickling, or canning) salt to one quart of water, with a teaspoonful of baking soda thrown in. For severe nasal congestion due to allergies, allergy shots (also called desensitization injections or allergen immunotherapy) can prove helpful by reducing your allergic sensitivities.

Some people develop a mechanical blockage to the sinus drainage tubes that no medication can correct. For instance, nasal polyps may grow within the nose, or the midline division (septum) separating the two sides of the nose may be shift to one side (referred to as a “deviated septum”), contributing to blockage of the sinus drainage system on one side. In these instances surgical correction of the blockage may be necessary. Successful surgery creates broad openings through which the sinuses can drain freely into the back of the nose.

Nasal Polyps



from www.entusa.com

Finally, the choice of antibiotics may be important. After multiple courses of antibiotics for numerous bouts of sinusitis, you may have developed resistant bacteria. Without surgical aspiration of the sinuses, we can only make educated guesses about the likely bacteria causing this infection and about the antibiotics to which they are likely to be sensitive. Sometimes, a very long course of antibiotics (4-6 weeks) helps to eradicate stubborn pockets of infection that had provided a nidus for recurrences. Occasionally your doctor will have to consider the possibility that a fungus rather than a bacteria is causing your sinusitis, altering the choice of medication to treat the infection.

Asthma Guidelines 2002 — Monitoring and Prevention

In the last issue of *Breath of Fresh Air*, we reviewed the updated recommendations regarding the treatment of asthma from the Expert Panel Report of the National Asthma Education and Prevention Program. The complete *Guidelines for the Diagnosis and Management of Asthma – Update on Selected Topics 2002* is now available online via the Internet at www.nhlbi.nih.gov (click on *Clinical Guidelines*). Two additional topics addressed in this Update are monitoring and prevention of asthma.

Monitoring: This group of asthma experts reviewed the evidence that written asthma action plans improve outcomes for people with asthma. They found that the published studies, only one of which included children, were not adequate to answer this question. The studies either did not contain enough patients to reach definitive conclusions, or they had potential biases in their design that called the results into question. Without conclusive evidence on either side of the debate, the Expert Panel offered the following opinion: “use of written action plans as part of an overall effort to educate patients in self-management is recommended, especially for patients with moderate or severe persistent asthma and patients with a history of severe exacerbations.”

In Massachusetts a major initiative launched to improve asthma care among children includes the use of written asthma action plans. This project, sponsored by Massachusetts Health Quality Partners, has made a standardized asthma action plan available to pediatricians, parents, and school nurses throughout the state. Use of these written asthma action plans is thought to improve communication among caregivers so they can provide better daily disease management and can respond more quickly and appropriately to asthmatic flare-ups. To view or print a copy of the Massachusetts Asthma Action Plan for children, you can go the website: www.mhqp.org/asthma.html.

Members of the Expert Panel also addressed the question of whether asthma action plans should use peak flow measurements as part of the decision making process, as opposed to action plans based solely on symptoms of asthma. Again they found that scientific study was lacking: they found only four published studies to address this question, none adequate to give a reliable answer to the question. Again they had to rely on their best judgment, which was that “peak flow monitoring for patients with moderate or persistent asthma should be considered because it may enhance clinician-patient communication and may increase

patient and caregiver awareness of the disease status and control.”

At Partners Asthma Center we share this opinion. Having a peak flow meter at home to measure your breathing is like having a thermometer handy. When you want to know whether you have a fever and, if so, how high your temperature is, you do best to measure your temperature with a thermometer rather than to rely on applying your hand to the forehead. So too, when you want to know whether your asthma has deteriorated and, if so, how badly, it is best to check your peak flow (and to compare it with your usual best value) rather than to guess based on how short of breath you may feel. Knowing your peak flow is particularly useful when you talk to your doctor or other healthcare provider. When you call to report a fever, it helps your doctor to know whether your temperature is 99° or 103.8°. In the same way, when you call to report your respiratory symptoms, your doctor will be helped immensely in providing you with the best advice if you can tell him or her whether your peak flow is 300 liters per minute (which might be $\frac{3}{4}$ of your own usual value) or 180 liters per minute (which would be less than $\frac{1}{2}$ of your usual value and a sign of a dangerous flare of your asthma).

Prevention: Preventive medicines for asthma, such as inhaled steroids and the leukotriene blockers, improve your breathing, quiet your asthma, and help protect you against serious asthma attacks. Members of the Expert Panel wondered whether there was also evidence, as some physicians had suggested, that treating children at a young age with preventive medicines might prevent worsening of asthma over time. Might early use of inhaled steroids protect against deterioration of lung function or worsening of symptoms as a child grows older? Based on their review of the evidence, they concluded that early use of controller medicines does not alter the course of asthma over time. Preventive therapy improves asthma control, lessens symptoms, and reduces the likelihood of asthmatic exacerbations, but it has not been shown to alter the underlying disease process. When the medicines are stopped, the asthma returns to the way it was before treatment.

Some people with asthma, probably a small minority, suffer a permanent loss of lung function as they grow older. The questions remain: is there a treatment that can prevent this decline in breathing capacity; and if so, how soon after the diagnosis of asthma does it need to be begun?



Nighttime Asthma, from page 1

asthma symptoms, and 2) intensify your treatment. Highly effective treatments are available, both anti-inflammatory medications that will subdue the twitchiness of the airways and long-acting bronchodilators that will prevent constriction of the bronchial muscles throughout the night.

Laryngospasm

There is another condition that sounds in many ways like nocturnal asthma but is, in fact, unrelated. In this condition the blockage to breathing occurs not in the bronchial tubes, but at the level of the vocal cords. It occurs in people with or without asthma, and is properly diagnosed as laryngospasm (spasm of the larynx or vocal cords). Nighttime awakenings due to laryngospasm are utterly frightening. Patients report that they wake unable to breathe at all. It may sound like an exaggeration, but in truth for a few seconds the vocal cords at the base of the neck shut closed, blocking any movement of air in or out of the lungs. For a few seconds there is no air passing in or out, no ability to talk or call

out. The best thing to do is not to panic. Within moments, the vocal cords begin to relax, and a small amount of air can pass between them. At this phase the breathing makes a noise that you might call “wheezing,” but it is different. It occurs only when you breathe in, it has only one note or pitch, and it clearly originates in the throat area. Within seconds, this inspiratory noise (properly referred to as stridor) lessens and stops. The whole episode is over in less than a minute, although your heart may keep pounding from the fright!

Spasm of the vocal cords of this sort is probably triggered when some saliva or mucus or coughed liquid hits the nerve endings that densely surround this area. It is an uncontrollable reflex, meant to protect your windpipe from the aspiration of foreign material. The vocal cords will always begin to relax on their own. There is no need (or time) to reach for any medication. Continue to try to breathe calmly, and in a few seconds you will find that you can do so again.



Asthma Support Group

The Partners Asthma Center Support Group will resume meeting this Spring on the **last Tuesday of every month** from **6:30 – 8:00 p.m.** Each session begins with a brief informative presentation followed by open discussion and sharing of ideas and experiences about asthma. Please note the specific locations for the upcoming Support Group sessions. For more information, call Elaine Carter at 617-732-7419.

<u>Date:</u>	<u>Location</u>	<u>Topic</u>
March 25:	Brigham and Women’s Hospital Tower 4A 75 Francis Street	<i>Food Allergies</i>
April 29:	Faulkner Hospital Suite 4930 1153 Centre Street Jamaica Plain	<i>New Asthma Therapies</i>
May 27:	Brigham and Women’s Hospital Tower 4A 75 Francis Street	<i>Steroids and Bone Health</i>
June 24:	Faulkner Hospital Suite 4930 1153 Centre Street Jamaica Plain	<i>Latex Allergy</i>

Save the Date!

Partners Asthma Center's Spring Asthma Symposium

“Asthma in Men and Women: Similarities and Differences”

Tuesday, May 6, 2003
(World Asthma Day)

6:00 – 8:00 p.m.

Brigham and Women's Hospital
Thorn Conference Room
Nearest entrance: 45 Francis Street



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