

TEACHERS AND RESPIRATORY RELATED ILLNESS

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There is general public awareness of the allergic problems of schoolchildren. Exercise-induced asthma and severe food allergies, particularly peanut and tree nuts, are relatively common and potentially life threatening to schoolchildren. These conditions, among other allergic and respiratory conditions, have been recognized and addressed within school systems by administrators, teachers and parents. In contrast, the allergic and respiratory issues of teachers and other school employees have drawn little attention by the medical and educational communities. Review of the medical and occupational literature reveals a meager number of studies or articles addressing this situation despite occupational surveys revealing that teachers and school employees have a higher prevalence of respiratory-related illnesses than most other professions.

SIGNS AND SYMPTOMS OF RESPIRATORY-RELATED ILLNESS

Teachers and school system employees frequently develop respiratory infections manifested by sore throats, ear infections, and sinusitis. Related conditions that commonly occur include:

- Chronic nasal and eye symptoms
- Hoarseness and voice quality issues (throat clearing)
- Chronic cough
- Headaches
- Fatigue
- Asthmatic type symptoms
- Disrupted sleep patterns

Similar to schoolchildren, teachers and other school system employees may also exhibit potential life-threatening food allergies in the cafeteria or threatening allergic reactions to insect bites on the playing field.

INCREASED EXPOSURE TO RESPIRATORY INFECTIONS

There are multiple and overlapping factors contributing to teachers' frequent development of respiratory infections. Certainly a major factor is the increased exposure to respiratory viruses in the school setting. Viral and bacterial diseases are contracted through various routes. While aerosolized respiratory droplets through sneezing and coughing in close proximity is a common pathway, hand-to-hand and hand-to-face contact effectively transmits infection. Schoolchildren, particularly pre-school and grade-schoolers, contribute to passing respiratory disease because they have an increased number of respiratory illnesses and have less developed hygiene skills. A child with normal immunity may have up to ten separate upper respiratory infections per year.

ALLERGY AS A MAJOR RISK FACTOR

The factors that increase teachers' opportunities to contract and fight off respiratory infection are commonly overlooked. In particular, allergic diseases are a major contributing problem. Twenty to twenty five percent of the population is allergic. These individuals have the genetic capability to develop allergic diseases after



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repeated exposure to allergens – small, normally harmless substances. Common allergens for respiratory diseases include dust mite particles, dander and secretions of dogs and cats, mold spores, and pollens, especially springtime oak and tree pollens. The disease manifestations of allergy include:

- Nasal obstruction
- Runny nose
- Postnasal drip
- Sinus pressure and headache
- Itchy, watery and red eyes
- Asthma- cough, chest tightness, wheezing and shortness of breath

Allergic inflammation directly contributes to generalized fatigue and further contributes indirectly through nasal obstruction which results in a disruptive sleep cycle. Allergy contributes to infection development through inflamed respiratory tissues that are less effective fighting viral and bacterial infections. Furthermore, nasal mucosal inflammation leads to obstruction and the easier development of ear infections (otitis media) and sinus infections (sinusitis). A third but hypothetical factor in allergy contributing to respiratory infection is that the allergic immune pathway may divert the immune system “away” from resisting infection.

IS IT ALLERGY OR IRRITANT?

Other than allergy, irritants and irritative conditions can provide ripe conditions for respiratory infections. Identifying the underlying cause as allergic or irritant is vital to developing effective treatment and management plans. In contrast to allergens, all individuals are susceptible to the effects of irritants, albeit, some are more sensitive than others. The classic and most documented irritant is first and second-hand smoking. Other irritants include environmental pollutants (e.g. smog) and strong odors.

Vasomotor rhinitis is a condition of sensitivity to environmental irritants manifesting as nasal congestion, runny nose and post nasal drip. Vasomotor rhinitis occurs more often as people age and is more common than allergic rhinitis among middle-aged and elderly persons. This condition can be differentiated from allergic rhinitis with an appropriate diagnostic evaluation. An additional factor contributing to the development of vasomotor rhinitis is gastro-esophageal reflux disease (GERD), which may be “silent” in many individuals. GERD symptoms include heartburn, bad breath, sore throat and fullness after eating. This common condition contributes to hoarseness, clearing throat, and cough, in addition to vasomotor rhinitis.

MOLDS AND ENVIRONMENTAL EXPOSURE

While much has been written about toxicity from mold, e.g. “black mold”, there is little evidence supporting the toxic role of mold, unless there is extraordinary exposure. Mold exposure can commonly cause two types of reactions. There is the classic allergic reaction to mold resulting in nasal allergies and asthma, and the irritant effect from the odor of mold. Schools can be a significant source of mold spores, as well as dust mite and even pet dander. However, mold spore counts, while high in some schools, are generally much less than outdoors. While rarely a toxin, high mold spore levels in closed spaces with poor ventilation can act as an irritant. Most building-related complaints are resolved by removing water damaged and moldy materials and improving ventilation rates with increased fresh air.



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SINUSITIS, IMMUNE DEFICIENCY AND VOICE DISORDERS

Recurrent upper respiratory infections can contribute to vasomotor rhinitis and lead to chronic sinusitis. The sinuses can become chronically inflamed with infection or inflamed with non-infectious tissue. Symptoms include nasal stuffiness, thick post nasal drip, sinus pressure and headaches, and discolored secretions.

A consideration for teachers with recurrent respiratory infections is the possibility of an impaired immune system. While uncommon, the development of a primary immune deficiency will generally present as recurrent sinopulmonary bacterial infections. These diseases include IgA deficiency, common variable immunodeficiency, and selective antibody deficiency.

Voice disorders are common among teachers who use their voices for prolonged periods. While voice overuse issues may be involved, multiple factors lead to hoarseness and dysfunctional voice quality including: development of vocal cord nodules, improper voice use, post nasal drip from allergies, sinusitis, vasomotor factors, as well as gastro-esophageal reflux disease.

HOW TO DECREASE RESPIRATORY-RELATED ILLNESS

How can teachers decrease the likelihood of contracting respiratory infections? Good hygiene in and out of the classroom is helpful, especially practicing effective hand washing techniques and use of hand purification products. While decreasing airborne transmission of infections is desirable, it is difficult to accomplish in crowded spaces, especially among younger children. Products boasting their “immune booster” or “infection prevention” value are generally ineffective. These products either do not have a scientific basis or have been shown by clinical research not to be effective, e.g. Echinecea. A healthy lifestyle will decrease the infection rate through regular exercise, adequate sleep, proper diet, and decreased stress.

IDENTIFY UNDERLYING CONDITIONS

The easiest and most effective approach to decreasing respiratory infections is to identify and treat underlying conditions. Chronic rhinitis may be allergic, irritative (vasomotor), obstructive or infectious. Chronic cough could be a symptom of asthma. Gastroesophageal reflux may be present. The immune system may be dysfunctional. The home or school environment may have excess allergens or irritants. A medical evaluation should include a careful history and physical examination followed by the appropriate diagnostic studies to identify the conditions of concern.

- Allergy skin testing is the most accurate method of identifying if the respiratory condition is allergic driven. Positive and negative allergy skin tests need to be correlated to the medical history and physical exam for clinical relevance.
- Pulmonary function testing helps establish the diagnosis and severity of asthma.
- Rhinoscopy identifies nasal obstructions, chronic sinusitis, vocal cord abnormalities and evidence of gastroesophageal reflux disease.
- Immunologic laboratory tests assess the adequacy of the immune system in fighting infections. Test results require expert interpretation for clinical relevance.
- Homes and schools may benefit from environmental inspection, the results of which need to be interpreted and correlated to the medical conditions of concern.

TREATMENT: AVOIDANCE, MEDICINE, AND IMMUNOTHERAPY

The treatment of chronic and recurrent respiratory illnesses involves:

- Environmental control
- Medical management (drug therapy)
- Immune modulation, e.g. allergy immunotherapy and intravenous gamma globulin replacement

Environmental measures should be tailored to identified allergens and relevant irritants. Dust mites are the major allergen in dust and cause allergic symptoms in up to 80% of individuals with allergic respiratory disease in warm, humid climates such as Florida. The majority of evidenced-based dust mite control measures are relatively inexpensive for the home and center around bedding and the bedroom. Institutional control should focus on decreasing carpeted areas and upholstered furniture, and maintaining proper air conditioning and heating systems. Pet dander is brought into schools on clothing and will be transferred to upholstery and carpeting. Outdoor pollens are usually removed by ventilation and air conditioning systems. Mold spores can contaminate ventilation systems and water damaged building areas. Proper maintenance of ventilation systems and repair of water-damaged areas will greatly reduce mold spore exposure. Special areas of concern in schools include industrial arts, science laboratories and kitchens due to potential generation of irritating substances.

Medical management of chronic respiratory illness should focus on the most effective and safest approach to the identified diagnostic conditions. The scope of this discussion prevents an in depth discussion of the drug treatment of the various medical conditions contributing to recurrent and chronic respiratory illness. While the “common cold” or flu is best treated by supportive care and not antibiotics, acute and chronic sinusitis generally requires a sometimes lengthy course of antibiotics to break the cycle of recurrent and chronic bacterial sinusitis. Among drug therapies for allergic rhinitis, nasal corticosteroids are the most effective, and for vasomotor rhinitis, nasal saline is inexpensive, natural and brings substantial relief. The treatment of GERD includes diet management and prescription or non-prescription antacids, which may bring prompt relief to esophageal symptoms but may require weeks, if not months, of therapy to decrease upper airway symptoms.

Immune modulation offers unique, relatively safe and lasting relief for allergic and immune deficient diseases. Allergy immunotherapy (allergy shots) is a natural, safe treatment resulting in the immune system developing lasting protection from specific allergens. This protection results in decreasing existing and preventing further allergic disease. Gamma globulin infusions replace the missing antibodies in individuals with immune deficiency, boosting the ability to fight bacterial upper and lower respiratory infections.

Recurrent and chronic respiratory infections, chronic rhinitis, coughs, asthma, headaches and fatigue are common complaints of teachers. Proper diagnosis of underlying medical conditions and their appropriate treatment can greatly reduce these conditions, thereby improving overall health status and quality of life.