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Indoor Mold Exposure – Effects, Recognition, and Management

Case: A 7-year-old child with asthma for two years comes into your office. His mother notes that in the last year almost all of his attacks (1/week on average) were at school. He has not had any during weekends or school holidays, and he only had 1-2 attacks over the past summer. It is now October of the new school year and the child needs his inhaler at least two times per week – always at school. His mother read in the paper that wheezing can be caused by mold. She wants to know if this could be the case for her son and if there is anything she can do about it.

Comments:

Chronic mold exposure is known to exacerbate asthma, recurrent rhinitis/sinusitis, and allergies. Developing evidence also suggests that chronic mold exposure may cause mucosal irritation, hypersensitivity pneumonitis, and rarely, in infants, pulmonary hemorrhage.

Although molds can sometimes cause severe infections in patients who are immunocompromised or have cystic fibrosis, etc., these infections will not be covered here. Normal children are not at risk of these infections. High-risk patients should be restricted from buildings known to have large amounts of mold.

For the child in the case above, start by taking an environmental history. The important questions to ask concern the patient's symptoms and the likelihood of mold exposure. Molds need water to live, and they grow best in high humidity or water soaked areas. The following questions can help determine whether a school or other building has a mold problem:

- Any plumbing?
- Any roof leaks?
- Any previous flooding?
- Any wet spots anywhere?
- Any visible mold on tiles, ceilings, walls, or floors?
- Is there a musty odor?
- Is there wall-to-wall carpet?
- Is there an air conditioner or humidifier in the building?[1]

A yes answer to any of the above questions except the last one, suggests that the building may have a mold problem. In terms of the last question, mold grows more easily in buildings with

>40% humidity. Therefore, in a building that already has water damage, an air conditioner can decrease the chance of mold growth while a humidifier can increase it.

A medical history is currently the best way to determine if mold could be the cause of clinical symptoms. Allergy testing for mold often involves unstandardized extracts that make true sensitivity hard to establish. There are no measurement techniques to measure mold spores in a patient's body. And, it is not easy or inexpensive to measure the quantity of airborne mold spores in a building. If the spore quantity is measured, it requires professional interpretation including clinical correlation.

If the timing of a patient's ill symptoms correlate with being in a building with previous water damage and mold problems (i.e. a positive answer to one of the previous questions), the family has a couple of options. First, the family should work with the school to have the problem evaluated and hopefully rectified [2,3,4,5]. The patient may be temporarily removed from his classroom/school to see if symptoms resolve. Or, he may permanently switch schools. Stepping outside of our case - if the mold problem is at home, the family can try to remove it themselves.[2,4,5,6,7]

Complete removal from the environment may be necessary if the illness is severe or progressive. Of course, up-to-date medical management of the condition is also appropriate. For the child in this case, his asthma should be managed according to the NHLBI guidelines for mild persistent asthma. [8]

Conclusions:

A good history remains the principle component of patient evaluation. Follow-up is the key to evaluating the success of an intervention and helping pin down mold as a risk factor. Mold is one of the most common sensitizers in children's asthma and allergies. Asthma may not completely subside once it has developed, so ongoing care remains critical.

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[1] Storey E et al. Guidance for clinicians on the recognition and management of health effects related to mold exposure indoors. A draft submitted to the U.S. Environmental Protection Agency indoor Environments Division. Feb 2003.

[2] Indoor Air Mold available at www.epa.gov/iaq/molds/moldresources.html

[3] Mold Remediation in Schools and Commercial Buildings available at www.epa.gov/iaq/molds/mold_remediation.html

[4] EPA: Indoor Air Quality Information Clearinghouse (1-800-438-4318) for help with mold removal or other

[5] Mid-Atlantic Center for Children's Health and the Environment (202-994-1166 or Toll Free at 1-866-622-2431) for questions concerning health effects and diagnosis

[6] A Brief Guide to Mold, Moisture, and Your Home available at www.epa.gov/iaq/molds/moldguide.html

[7] Mold in My Home: What Do I Do available at www.dhs.ca.gov/PS/deodc/ehib/ehib2/PDF/MOLD_2001_07_17FINAL.pdf

[8] National Asthma Education and Prevention Program Expert Panel Report: Guidelines for the Diagnosis and Management of Asthma Update on Selected Topics-2002. Journal of Asthma and Clinical Immunology, 2002, 110 (pt 2), S141-219, available at http://www2.us.elsevierhealth.com/scripts/om.dll/serve?action=searchDB&searchDBfor=iss&id=jai021105b

Other Readings:

American College of Occupational and Environmental Medicine Evidence-Based Statement. Adverse human health effects associated with molds in the indoor environment. Journal of Occupational and Environmental Medicine. 2003. 45(5)

Etzel RA. Indoor air pollutants in homes and schools. Pediatric Clinics of North America. 2001. 48(5).

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