Environmental Factors in Pediatric Pulmonary Care: A Needs Assessment and Development of Educational Materials for Families

College of Public Health and Health Professions
Department of Environmental and Global Health
UNIVERSITY of FLORIDA

Jack Vann[1,2], B.S., Susan Horky[2], MSW, LCSW

[1]Department of Environmental & Global Health, College of Public Health & Health Professions, [2] Pediatric Pulmonary Division, Department of Pediatrics, College of Medicine

Introduction

Summary of Critical Literature: The literature on environmental exposures and their impacts on patients with severe respiratory illnesses is both extensive, and can at the same time be highly specific to a variety of factors. One of the most relevant articles to patients in Florida discussed the consistent positive trend between *dampness/mold indoors* and *asthma development in adolescents*, suggesting that *prevention of indoor moisture* would reduce health risks across all ages. Another study examined the short term effects of *PM_{10} exposure* on respiratory health of asthmatic children, which showed an increased risk of *aggravating existing asthma symptoms*.

Context for this project: Environmental factors can have a long lasting impact on the health outcomes of children with respiratory illnesses, and in ways that the average person may not realize. For example, healthcare professionals in the Pediatric Pulmonary Center are asked not to wear things such as colognes, perfumes and other scented products, because these can aggravate the children's illnesses and make breathing more difficult.

PPC physicians and nurse practitioners provide general patient education on irritants and allergens, but acknowledge that may not sufficiently address all of these. Without proper education children may continue to be symptomatic, even if on an adequate medication regimen. This special project aimed to fill this need by assessing the patient/families knowledge about asthma triggers their home environment as a basis for subsequent preparation of educational materials. This project is significant to public health because environmental factors can have a major impact the morbidity, mortality and quality of life of patients with severe respiratory illnesses and their caretakers.

Objectives:

- To develop a needs assessment about asthma knowledge and environmental health, and distribute as part of Quality Improvement activity in pediatric clinic
- To develop and distribute educational handouts about pertinent environmental health issues to patients with severe respiratory illnesses based on needs assessment from survey

Description of Methods

1. Focus groups with Pediatric Pulmonary Physicians and care providers to determine what they thought patients may find most useful from education intervention
2. Reviewed literature to find relevant information about asthma that families with an asthmatic child may or may not know
3. Drafted a series of questions for a needs assessment using UF Qualtrics survey software
4. Sought out feedback on anonymous survey items from PPC faculty and staff
5. Worked with the Pediatric Pulmonary physicians and nurses to distribute the anonymous survey to families who agreed to participate during Severe Asthma Clinic on a provided laptop

Overall justification of methods:

The PPC has expressed a desire to know more about what patients and their families understand about their illnesses in the context of environmental health. In order to target the patient educational materials to actual patient needs, it is necessary first to do a needs assessment and to determine a baseline of knowledge for educational materials.

Stakeholder involvement:

-Development of materials will depend on needs identified by patients
-Materials will be developed based on input from other PPC faculty/staff including the Family Partner, social workers, nutritionists, trainees, and other PPC specialists.

Results

Preliminary impressions from 21 family responses in clinic suggest that:

- A large number of families are aware of dust as a triggers but don't seem aware of other less-common triggers
- About half of families who recognize dust as an asthma trigger aren't using dust/allergy covers on their child's bed
- Few patients mention tobacco or wood smoke, bleach, air fresheners or mold
- Families say they know how they can get rid of triggers in their home but say their homes don't need any changes
- Most families don't have upholstered furniture in the home
- Almost all families have HVAC systems that use air filters, but the frequencies which they are changed vary
- Some families didn't know more "niche" triggers and sensitivities; some believed myths about fake triggers
- Leftover medicine disposal will be an area targeted for educational materials as most families were unsure about proper disposal procedures

Figure 1: A pie chart showing families' responses to a question asking why they have not made changes to reduce asthma triggers in their home.

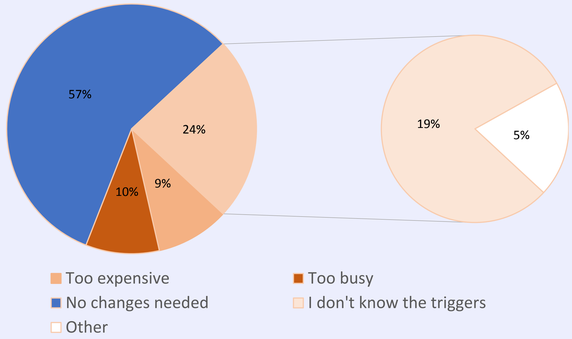
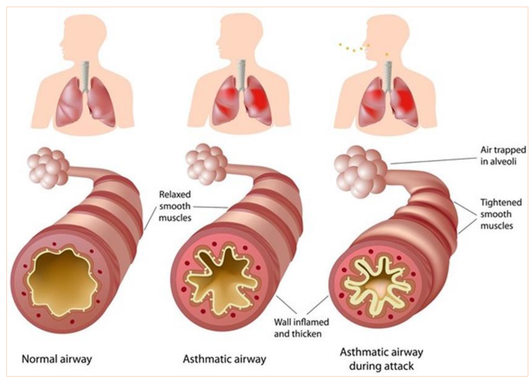


Figure 2: A bar graph showing averaged families' responses to a question asking what listed items they think could be an asthma trigger.

Discussion

This needs assessment has successfully demonstrated that there is a clear need for more targeted education for families coming into the severe asthma clinic in the Pediatric Pulmonary department. Considering that less than 75% of those surveyed identified sources of smoke or harsh cleaning products as important asthma triggers to severely asthmatic children indicates there is a disconnect between the healthcare providers and the patients that needs to be resolved.

While the body of scientific literature says there are important steps to take as the parent of an asthmatic child, based on our findings it seems that there are two distinct subgroups of familial units: one group is very in-touch with the sensitivities of their child to certain triggers and what must be done around the home to help, while there is another group whose education about asthma is clearly lacking. These findings will be used as a guide to develop targeted educational materials in ways that can bridge the knowledge gap between these two subgroups of families to improve the health outcomes of their children.



Implications

The Pediatric Pulmonary Center's interdisciplinary team expressed interest in a quality improvement project to assess patients' awareness of their unique asthma triggers, as they were unsure if patients were aware of the full range of their asthma triggers. This special project was designed to address this need. The pulmonologists and other clinicians value feedback from patients to help with day-to-day improvements and this special project will help them gauge the learning needs of the patients, related to asthma triggers, and to educate the families accordingly. This needs assessment provided important information about educational resources needed and areas to focus on during clinic visits.

Relationship of this project to the internship experience:
The Pediatric Pulmonary Center and the grant that funds it focuses heavily on receiving the patient's viewpoint as a more holistic part of a "family-centered, culturally competent, community-based" ideology for effective delivery of care to children with chronic respiratory illnesses. This project adopts the patient-first philosophy of the PPC to meet the needs of the patients in the severe asthma clinic for maximum efficacy.

Lessons Learned

-Seeing the "other side" of the physician-patient dynamic
-Gaining valuable insight into the lives of families with a chronic illness
- Logistical challenges of implementing a QI survey in a clinic setting

Competencies:

- *Communicating effectively with public health constituencies in oral and written forms.* (MPH)
- *Informing, educating, and empowering people about health issues.* (MPH)
- *Specify approaches for assessing, preventing, and controlling environmental hazards that pose risks to human health and the environment.* (Concentration)
- *Describe to specific communities or general populations the direct and indirect human and ecological effects of major environmental agents.* (Concentration)

Moving Forward

The next step for this project will be developing educational materials (likely brochures or fliers) for the patients and their families, to address the areas of insufficient knowledge identified on the needs assessment. Survey results will be reviewed in detail to identify the knowledge areas most in need of improvement. Team members and some patients will be asked for feedback/input as the new materials are being developed. Written materials have been shown to improve health literacy and fliers/brochures will supply needed information on triggers, even when providers do not have time to elaborate on these.

Recommendations for future projects:

- Assess patient satisfaction with educational materials
- Train providers on information related to triggers that they should give more attention during patient visits
- Re-Assess patient knowledge of asthma triggers after educational materials have been available for a specified period of time
- Assess provider satisfaction with educational materials

References

1. Goss, C. H., Newsom, S. A., Schildcrout, J. S., Sheppard, L., & Kaufman, J. D. (2004). Effect of Ambient Air Pollution on Pulmonary Exacerbations and Lung Function in Cystic Fibrosis. American Journal of Respiratory and Critical Care Medicine, 169(7), 816-821. doi:10.1164/rccm.200306-779oc.

2. Mendell, M. J., Mirer, A. G., Cheung, K., Tong, M., & Douwes, J. (2011). Respiratory and Allergic Health Effects of Dampness, Mold, and Dampness-Related Agents: A Review of the Epidemiologic Evidence. Environmental Health Perspectives, 119(6), 748–756. http://doi.org/10.1289/ehp.1002410.

3. Weinmayr, G., Romeo, E., Sario, M. D., Weiland, S. K., & Forastiere, F. (2009). Short-Term Effects of PM10 and NO2 on Respiratory Health among Children with Asthma or Asthma-like Symptoms: A Systematic Review and Meta-Analysis. Environmental Health Perspectives, 118(4), 449-457. doi:10.1289/ehp.0900844.

4. Zuraimi, M. S., Tham, K. W., Chew, F. T. and Ooi, P. L. (2007), The effect of ventilation strategies of child care centers on indoor air quality and respiratory health of children in Singapore. Indoor Air, 17: 317–327. doi:10.1111/j.1600-0668.2007.00480.x.