Allergic Rhinitis, Environmental Triggers and Treatment Modalities

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Rhinitis is defined by the American Academy of Allergy, Asthma & Immunology (AAAAI) as a condition "characterized by 1 or more of the following nasal symptoms: congestion, rhinorrhea … sneezing and itching" (Wallace et al., 2008, p. S3). The World Allergy Organization (Pawankar, Canonica, Holgate, & Lockey, 2012) estimates that rhinitis affects 10 percent to 30 percent of all adults, and the incidence is increasing. Rhinitis can have a profound effect on people's health, productivity and quality of life.

Comorbidities and Cost

Rhinitis is more than just "a runny nose," as shown by the comorbidities in Box 1. It can have a significant impact on many body systems and functions. Rhinitis can be allergic or nonallergic. The difference is that the immune system is involved only in allergic rhinitis. Meltzer and Bukstein (2011) estimated that the direct cost associated with allergic rhinitis is approximately $3.4 billion. In addition, allergic rhinitis is the fifth leading cause of chronic diseases in the United States (Blaiss, 2010).

Abstract Allergic rhinitis is a clinical condition with effects ranging from mildly bothersome to life-threatening. Women's quality of life as well as productivity at home, at work and in the community can be greatly affected. It's imperative that clinicians engage in a complete health history with each woman presenting with allergic rhinitis to try to identify potential environmental triggers. Once the allergens are identified, a multifaceted treatment plan can be devised to help women maintain optimal functionality. DOI: 10.1111/1751-486X.12081

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Box 1.

Comorbid Conditions of Allergic Rhinitis

- Acute otitis media
- Anaphylaxis
- Asthma
- Depression
- Eczema
- Eustachian tube dysfunction
- Fatigue
- Gastrointestinal symptoms (e.g., nausea, vomiting, diarrhea)
- Gastroesophageal reflux disease (GERD)
- Laryngitis
- Nasal polyps
- Otitis media with effusion
- Sinusitis
- Sleep disorder
- Viral infection

Symptoms

Symptoms of allergic rhinitis are listed in Box 2. These symptoms frequently lead to women seeking health care to identify and control these symptoms. A thorough health history and physical examination are needed to properly treat each person's individual situation. Box 3 identifies possible physical examination findings in women with allergic rhinitis.

Triggers

To have the greatest chance of successful treatment, symptom triggers must be identified. Triggers for allergic rhinitis can be found everywhere—in the home, workplace and environment at large. Triggers can be episodic and vary by season and geographic location. A detailed health history can provide clues and possible identification of offending substances (Estes, 2014). The challenge for clinicians is to look at all aspects of a woman's life to identify the trigger(s). This article presents three scenarios to help identify triggers of allergic rhinitis and various treatment options.

Scenario #1—Environmental Triggers

A 78-year-old woman presents with itchy eyes, ears and nose. She has had persistent clear nasal drainage for 8 days. Two days ago she started having postnasal drip that is causing a cough and is keeping her up at night. She tells you that her 60-year high school reunion is next week and in preparation for this event she went to her basement to retrieve some old photos to take to the reunion. The photo box has been in the basement for years and she had to move a lot of dusty boxes in order to find the correct one. In addition, with the recent rains she smelled a musty odor in the basement and saw black mold around the carpet's edges.

Home

The home environment contains many possible triggers for allergic rhinitis. A careful history can tease out these triggers. The trigger can be a new

Box 2.

Symptoms of Allergic Rhinitis

- Dyspnea
- Facial pressure
- Fatigue
- Headache
- Irritability
- Itchy eyes, ears, nose, roof of mouth
- Nasal congestion
- Otalgia
- Rhinorrhea
- Sense of smell changes
- Sleep apnea
- Sleep fragmentation
- Sneezing
- Tearing eyes

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item introduced into the home such as a pet, or changes to the environment, such as construction. Box 4 lists triggers that can be found in the home environment. Reviewing this list reveals that fungi (such as mold), dust mites, animal dander and airborne gases are the sources of most indoor allergens.

Workplace

The workplace for a woman can be her own home, an office, a construction site or a myriad of other locations. The environment can be static, as in the same office/factory, or it can change daily, as it does for a firefighter.

A woman's employment may be outdoors and this can expose her to a host of numerous other possible triggers. Outdoor allergens such as grass/tree/weed pollens can initiate an allergic response. Pollution levels can vary daily and can also affect some women. "Code Red" days, or those days when there are high levels of air pollutants, can trigger a severe response, especially for women with asthma. Wind and rain also can trigger an allergic response, as wind can transport pollen and rain can lead to an increased concentration of mold spores. It's important to note that sudden, brief thunderstorms do not always reduce pollen counts. Prolonged, slow rains can reduce particle exposure and at the same time serve as a reservoir for mold spore growth in selected areas.

Although the Occupational Safety and Health Administration (OSHA) specifies conditions to minimize the risk of occupational health risks, some professions pose a higher risk than others. Exposure to fumes or aerosolized particles account for an increased allergic rhinitis exposure for many occupations, such as beautician, factory worker, farmer and miner. Clinicians can reassure women that they aren't being "nosy" when inquiring about job/workplace, but rather exploring those elements as possible factors impacting their current health status.

Hobbies and Leisure Activities

It's crucial to investigate the activities women engage in their spare time. What a woman chooses to do to relax can have a profound impact on her health. Exposure to small particles—such as from mold while gardening, animal dander from volunteering at an animal shelter, wood particles from building a cabinet, fumes while painting or air quality while hiking—can have a profound impact on a woman and trigger allergic rhinitis. Thus, hobbies and leisure activities are facets of a woman's health history that need to be explored.

Scenario #2—Travel Related Triggers

A 55-year-old business woman from the mid-Atlantic region was promoted to vice president of her company 2 months ago. She now must travel to Florida and the West Coast every few weeks. Typically she stays in a hotel 10 days per month. She tells you that she is exhausted from all the travel. She has difficulty sleeping in a hotel room. Her asthma is getting worse and she is using her albuterol inhaler at least four times daily.

People who travel, whether for business or pleasure, may experience

Exposure to fumes or aerosolized particles account for an increased allergic rhinitis exposure for many occupations, such as beautician, factory worker, farmer and miner

Box 3.

Physical Examination Findings of Allergic Rhinitis

Ophthalmic findings:
Allergic shiners
Corneal injection
Eyelid discharge
Eyelid edema
Periorbital edema
Photophobia
Watery eyes

Nasal findings:
Dennie's sign (nasal crease)
Nasal discharge (usually clear)
Pale nasal mucosa

Otalgic findings:
Serous otitis media
Tympanic membrane retraction (secondary to eustachian tube dysfunction)

Oropharyngeal findings:
Angioedema
Open mouth breathing
Postnasal drip

Integumentary findings:
Eczema
Urticaria

Pulmonary findings:
Asthma
Cough

a new onset of allergic rhinitis symptoms. They are away from their normal habitat and are exposed to new allergens, both in the work setting and in the temporary housing. A hotel room or other living quarters may have heavily upholstered furniture and carpeting (both can harbor dust mites), and possibly mold. Similarly, a woman from the mid-Atlantic

Clinicians should be familiar with seasonal triggers that are endemic to their geographic location as well as those that occur with episodic events, such as tornadoes, hurricanes and floods

who travels to Florida in January is exposed to pollen at an earlier time of the calendar year than what is her norm. The combination of exposure to this allergen plus the temporary living quarters poses a higher trigger risk of allergic rhinitis for some women. Thus, it's important to ask about travel as part of the health history.

Box 4.

Home Environment Triggers of Allergic Rhinitis

- Air fresheners
- Bathroom mold (or mold found in any other location)
- Cockroaches (which can be found in even the cleanest of houses)
- Damp basement (or any other location)
- Dust mites
- Feather pillows
- Fireplace smoke
- Furred rodents (e.g., mice, rats)
- Garbage cans
- Humidifier reservoir
- Household cleaning products
- Odors (e.g., aerosolized during cooking, foods)
- Perfumes
- Pets (e.g., cat, dog, birds, hamsters, guinea pig, ferrets)
- Personal products (e.g., hair spray, nail polish)
- Plants (indoor and outdoor)
- Soiled upholstery
- Space heaters
- Tobacco smoke

Box 5.

Common Medications Used to Treat Allergic Rhinitis*

Type of Medication	FDA Pregnancy Category	Comments
Oral Medications		
Antihistamine		
Chlorpheniramine, diphenhydramine (in third trimester)	B	
Cetirizine, desloratadine, fexofenadine, hydroxyzine, levocetirizine dihydrochloride, loratadine	C	
Carbinoxamine maleate	C	Contraindicated or not recommended in lactating women
Decongestant		
Pseudoephedrine	B	
Oxymetazoline	C	
Leukotriene receptor antagonist		
Montelukast	B	
Steroid		
Dexamethasone, methylprednisolone, prednisolone	C	
Nasal Medications		
Anticholinergic		
Ipratropium bromide	B	
Antihistamine		
Azelastine, olopatadine	C	
Steroid		
Budesonide	B	
Beclomethasone dipropionate, ciclesonide, fluticasone, mometasone furoate, triamcinolone acetonide	C	
Topical Medications		
Immunomodulator		
Pimecrolimus, tacrolimus	C	Contraindicated or not recommended in lactating women
Steroid		
Topical steroids	C	

continued on next page

* Use these medications with caution in lactating women except where specified.

Box 5.
Common Medications Used to Treat Allergic Rhinitis *continued*

Type of Medication	FDA Pregnancy Category	Comments
Ophthalmic Medications		
Antihistamine/mast cell stabilizer		
Alcaftadine, azelastine, bepotastine besilate, epinastine, ketotifen, olopatadine	C	
Mast cell stabilizer		
Lodoxamide, nedocromil sodium	B	
NSAID		
Ketorolac tromethamine	C	Avoid in late pregnancy
Steroid		
Loteprednol etabonate	C	
Injectable Medications		
Immunotherapy (allergy shots)		According to the AAAAI (2013), immunotherapy cannot be initiated in pregnancy but for a woman who has been on allergy shots, it is safe to continue with careful monitoring
Epinephrine	C	Emergency use to treat anaphylaxis

Scenario #3—Seasonal Occurrence Triggers

A 35-year-old woman recently volunteered to chaperone her son's class trip to the pumpkin patch. She is 28 weeks pregnant. She walked through the hay maze and went on a hay ride. She presents with periorbital edema, facial pressure, tooth pain and a thick yellow nasal discharge.

This scenario illustrates a seasonal trend to some women's allergic rhinitis. In this case, the likelihood that some mold spores are contained in the hay at the pumpkin patch. Likewise, a woman who has spent time raking leaves or cutting grass has had significant exposure to potential triggers. Experienced clinicians can frequently anticipate some seasonal allergens and interject questions about them into women's health histories. A live Christmas tree is another example of seasonal allergens. The tree itself can harbor allergens, as can stagnant water in which the tree is placed. After severe storm damage, especially in hot, humid conditions, it's prudent to ask a woman if she has experienced any water damage in her place of residence or work environment. Clinicians should be familiar with seasonal triggers that are endemic to their geographic location as well as those that occur with episodic events, such as tornadoes, hurricanes and floods.

Family History

Keep in mind that women with allergic rhinitis frequently have a family history of this condition. Many also have asthma and atopic dermatitis. Collectively, this is referred to as the "atopy triad." Remember to ask women about the presence of this triad in their families.

Treatment Options

Once the allergens have been identified, a treatment plan can be devised. This can involve a

single intervention or a multifaceted approach composed of avoidance measures, medications and environmental adaptations. Simple avoidance measures range from avoiding outdoor activity on heavy pollen/pollution days or refraining from pet exposure. Box 5 identifies pharmacologic treatments for allergic rhinitis. Lastly, environmental adaptations can decrease symptoms. Measures such as keeping windows closed, encasing box springs, mattresses and pillows in protectors, and showering frequently can lessen the effect of identified allergens.

Practical Implications for Clinicians

Recognizing that the effects of allergic rhinitis on women are varied, clinicians need to develop a detailed repertoire of pertinent questions to try to help women identify possible triggers. Health history areas to consider are the home and work environments, hobbies and leisure activities and travel history. Identifying typical seasonal allergens or activities is also an essential component of the history. Educating women on the importance of adhering to the treatment regimen will significantly improve control of allergic rhinitis symptoms. Women with allergic rhinitis who are treated effectively with one or a combination of treatment modalities will have a higher quality of life with less risk for loss of productivity. **NWH**

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