Allergic Rhinitis in Childhood & New EUFOREA Algorithm

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Allergic Rhinitis

- Commonest immunological disorder
- Prevalence of up to 50% in some countries
- Global health problem
- Worldwide morbidity
- Caused by an (IgE)-mediated reaction
- Various indoor and outdoor allergens
- Presents in early childhood



Name of the document | month year | page 2

Allergic Rhinitis (AR)

- IgE-mediated
- Sensitization to inhaled allergens



Allergic rhinitis in childhood

- Misunderstood
- Mistreated
- Often missed
- Significant comorbidities
- Adverse effects upon quality of life
- Educational performance
- Can progress to asthma
- Worsen control of existing asthma





Name of the document | month year | page 4

Signs and symptoms

- Rhinorrhea, nasal congestion, postnasal drainage
- Pale nasal turbinates, with or without clear nasal discharge
- Repetitive sneezing
- Snoring
- Frequent sore throats
- Constant clearing of the throat
- Cough
- Itching of the palate, nose, ears, or eyes
- Headaches
- Rhinitis :nasal running, blocking, itching, sneezing, all are common in children due to viral colds





The European Forum for Research and Education in Allergy and Airways diseases

- Diagnosis and educational effective and treatment are important
- New EUFOREA algorithm : provides a succinct
 - wide- ranging guide to management at all levels
- Based on previous guidelines updated evidence and has been adjusted and approved by experts worldwide



Together for a healthy future

(EUFOREA)

- Optimal care for patients suffering from allergies and chronic respiratory conditions
- Pocket guide for adult AR was developed by an extended global panel of EUFOREA experts including a novel treatment algorithm when:
- Frequency of the common cold and the manifestations of AR mean that the diagnosis is often missed
- Treatment is inadequate
- Opportunities to alter the course of allergic disease by allergen specific immunotherapy (AIT) are being wasted



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Clues to an AR diagnosis

- Eyes Itching
- Allergic salute
- Exposure to a known allergen reliably causes symptoms
- Personal or family history of other allergic diseases
- Co-morbidity:

asthma, atopic eczema, rhino sinusitis, hearing difficulties, sleep disturbance, behavior problems, pollen food syndrome

- Always ask about nasal symptoms in such patients
- Always ask about asthma in children with rhinitis



ALLERGY SYMPTOMS

Cough



Redness

Itchy Nose

13.

Running Nose



Wheezing

Shortness of Breath

Sneezing



Edema





Lacrimation





Vomiting





Loose motions



Red Flags- for specialist attention

- Children with unilateral symptoms
- Severe nasal obstruction +- sleep apnea
- Children < 2 years
- History of rhinitis symptoms present continuously since birth
- Children with nasal polyps
- Those refractory to medical management



Complications of AR

- Reduce quality of life
- Sinuses, ears and chest
- Sleep problems
- reduced school/ work performance
- decreased involvement in outdoor activities
- AR predisposes to asthma
- reduces the control of concurrent asthma
- increasing likelihood of:
 - hospitalization
 - physician visits
 - asthma drug costs
 - use of short-acting beta agonists
 - use of oral corticosteroids





Epidemiology

- International Study of Asthma and Allergies in Childhood (ISAAC) 1997
- 156 centers in 56 countries
- Prevalence of allergic disease varied more than 20-fold between centers
- Rhinitis , asthma and eczema more common in western countries e.g., UK, New Zealand, Australia
- Severe symptoms in Africa and Latin America with significant morbidity
- In ISAAC Phase Three
- Asthma, rhinitis and eczema symptoms had increased over the previous 15 years, especially in younger children
- AR often begins in the under 5 y
- Prevalence increased from 8.5% in individuals aged 6–7 years to 14.6% in those aged 13–14 years



The natural history of AR

- 2 years (seasons) of environmental allergen exposure needed for sensitization that observed by specific serum IgE
- Incidence of allergic sensitization and AR is very low in the first 2 years
- Very few infants and toddlers develop allergic symptoms during pollen season before the 3 years
- The percentage increases between **3 12 years** ~**2% per year**



Outdoor Allergens

- Sensitization to outdoor allergens is more common in > 4–6 years
- Allergen molecules precedes the initiation of symptoms by several years
- IgE responses to pollen allergens increase with time (molecular allergen spreading)
- IgE serum increase in pre-symptomatic years
- After sensitization to pollen, symptoms within the next 3 years strongly increases
- Detection of preclinical allergic sensitization allow prediction of the onset of hay fever
- Most pollen seasons are at least 6 weeks long
- less than 2 weeks rarely indicate AR, unless concomitant exposure occurs (allergy to one type, less common)







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Indoor allergens (pet allergy)

- Sensitization in children >2 years
- Clinically sensitization may occur < 2 years, but unusual
- Appears as seasonal allergies, confused with pollen allergy
- Dander is shed in the spring and reacumulates in the fall
- Symptoms present for years, appear slowly over years
- Symptoms of URI can mimic allergies
- In the fall season with rhinovirus
- Worsen in winter secondary to longer hours spent indoors during the cold months
- The most common indoor allergens:
- Dust mites, pet dander, cockroaches, mold, pollens





Name of the document | month year | page 16

- Is the onset of the child's symptoms exclude the possibility of allergy to the family pet ? NO
- Is family pet hypoallergenic?
- No cats or dogs are truly hypoallergenic
- Pet triggers a child who previously had no allergy symptoms (mast cell saturation)
- Some pets trigger less allergic symptoms
- Dander exposure triggers symptoms



- Large home without carpeting with small pet trigger less severe symptoms than a large pet in a small house
- A child must be away from a pet



Name of the document | month year | page 17

Large amounts of allergens with sudden onset of nasal allergy symptoms





Name of the document | month year | page 18

Social and environmental history

- carpeted floor
- stuffed animals
- dusty closet
- Non leather furniture
- pet or bed din
- Cigarette smoke



- children < 3 years/bedding room(bed mattress)
- baby-sitters' and relatives' homes, daycare facilities, and schools (classroom pets)



Name of the document | month year | page 19

Does your child have a persistent cold? It could be an allergy





ltchy nose and/or sore throat



Nasal congestion





Coughing

• So :

In children < 5 years, differentiating allergy symptoms from recurrent URTI is even more difficult, especially in those who attend daycare and experience frequent rhinitis symptoms



Name of the document | month year | page 20

- Many children with AR had Eczema in infancy
- **%50** of the children with severe PAR had wheezing episodes (united airways) in young children, adults
- Treating both sites
- Rhinitis in childhood is a strong predictor for adolescent- and adultonset asthma
- In the German birth cohort:

Rhinitis in preschool children was a risk factor for subsequent wheeze when associated with allergic sensitization



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- Over 60% of children have eye symptoms, poorly recognized as allergic by the age of 20 years
- 1/2 2/3 have severe persistent
 AR (ARIA) affecting their daily life
- Boys develop rhinitis symptoms earlier
- Girls have higher incidences during and after puberty
- Comparable frequencies by age 20 years
- Sex shift in multimorbid patients with both asthma and rhinitis





Name of the document | month year | page 22

Management of AR in children

- History
- Where ,when , certain seasons of nasal symptoms
- Exacerbating and relieving factors
- Other symptoms, asthma, eczema
- ENT problems and food allergy
- Sleep and quality of life
- A history or family history of allergic disease
- Social history
- Specific places
- Animals
- Negative response does not eliminate the possibility of AR
- Taking antibiotics/ secondary sinusitis caused by AR



Name of the document | month year | page 23

Examination

- Conjunctivitis
- Allergic salute or Dennie Morgan lines
- Ability to breathe through the nose
- Nasal exam : clear secretion, Swollen pale turbinate, mucosa (normal or reddened)
- Nasal polyps (cystic fibrosis)
- ENT refer: bleeding, unilateral disease, high crusting, septal deviations
- Ear : otitis media with effusion (co-morbidity)
- chest ,lower airways function
- checking for concomitant asthma
- observing the skin for eczema



Name of the document 1 month year 1 page 24

Facial changes associated with allergy: he is pale, mouth breathing, with dark circles beneath eyes, a transverse nasal crease, double eye creases and loss of the lateral eyebrow. He is seen giving an allergic salute in the right-hand photo.





Name of the document 1 month year 1 page 25

Allergic sensitization diagnosis:

- Skin test (SPT) or specific serum IgE antibody analysis (any age)
- If allergen immunotherapy (AIT) is being considered then testing is mandatory
- false- positive and false- negative results
- SPT sensitivity 68 100% and specificity 70 91%
- CT scan
- Nasal smears (eosinophil)
- Nasal cultures , analysis of nasal fluid (different forms of rhinitis)



Name of the document | month year | page 26

Family history

- · Children with parents who have allergies or asthma are more likely to be affected
- One parent with allergies, chances are 30%
- 50–70% if both parents
- Patients with a history of infantile
 eczema have a 70% chance of having
 AR, asthma, or both
- Patients with a history of asthma have higher incidence of AR



A positive family history (father or mother with AR) is the best predictor of allergic rhinitis



Name of the document | month year | page 27

Laboratory Studies

No studies

- Skin-prick testing
- Serum allergen-specific IgE testing
- Nasal smear: Eosinophils
- CBC count with differential

Immunoglobulin E (IgE)

Allergen-specific IgE testing, Immuno CAP testing

Low IgE in 6 months

Detectable IgE , present symptoms of eczema, rhinitis, asthma, and food and inhalant allergens, predictive of future allergic symptoms



Name of the document | month year | page 28

Not needed unless sinusitis is suspected Rhinoscopy Spirometry , 70% of children with asthma have concomitant allergic rhinitis



Name of the document 1 month year 1 page 29

Treatments

- Education
- Allergen avoidance
- Pharmacotherapy and AIT
- EUFOREA algorithm

Based upon an update of previous evidence- based guidelines

- Education:
- Parent/carer education, saves time and costs in allergic diseases
- Finding and eliminating triggers (allergens and pollutants)
- Explanation of medication
- Demonstration of the way to use nasal sprays
- Continuation of patient contact via mobile apps and tele-health
- Children should score their own symptoms
- An emoji visual analog scale



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(A)

- 1. Shake bottle well
- 2. Look down
- Using right hand for left nostril put nozzle just inside nose aiming towards outside wall
- Squirt once or twice (2 different directions
- 5. Change hands and repeat for other side
- 6. Breathe in gently through the nose
- 7. Do not sniff



How to use a nasal spray:

It is necessary to put the spray onto the lateral walls of the nose, not the septum. It shouldn't be sniffed back hard into the nose but should be moved slowly by mucociliary clearance over the nasal mucosa where the corticosteroid can enter epithelial cells to exert its effects.



Name of the document | month year | page 31



- A suggested visual analog scale, using emojis:
- for younger children to express their feelings about their symptoms



Name of the document 1 month year 1 page 32

Allergen/Pollutant Avoidance :

- COVID and wearing of face masks
- Indoor air pollution include:
- smoking, damp, fossil fuels ,wood, dust, chemicals from building materials and furnishings, aerosol sprays and cleaning products
- Poor indoor air quality in low quality houses with inadequate ventilation
- Improved ventilation
- No smoking
- Avoidance of allergens, pets, HDM, mold
- Allergen proof bedding covers and
- HEPA filters on vacuum cleaners



Pharmacotherapy

- Antihistamines
- first-line treatment with problems
- sedating effects , lack good efficacy , psychomotor retardation and behavior disturbance , not recommended
- efficacy and safety of second generation antihistamines
- Rupatadine (1 mg/ml /day oral solution)
- Cetirizine, loratadine, cyproheptadine, fexofenadine and bilastine (> 6 years) with least brain penetration
- Orally are weakly effective
- Most suitable for mild AR
- Oral antihistamine fails, intranasal antihistamine or corticosteroid starts



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• Topical intranasal antihistamines :

- Act rapidly(15 min) , more effective than oral
- Azelastine with efficacy and safety ,bitter taste (10%)
- Olopatadine

• Intranasal Corticosteroids (INS) :

- Good quality , nasal congestion
- More effective than H1- antihistamines and leukotriene receptor antagonists,
- Maximum efficacy requires several hours or days
- INS first line treatment for AR moderate to severe
- Ciclesonide, fluticasone propionate, fluticasone furoate, mometasone furoate
- Growth in children
- Correct use of sprays reduces common adverse events , nasal irritation, stinging and epistaxis
- Long- term INS use does not damage the nasal mucosa



Name of the document 1 month year 1 page 35

Combination Therapy

Uncontrolled despite regular use of an INS and antihistamine

• Fixed dose combination (FDC) nasal spray :

- Azelastine and fluticasone propionate (MP-Aze-Flu) >6 years , rapidly active
- Well-tolerated (bitter taste) , intermittent treatment
- INS Plus Oral Anti-histamine ,extra-nasal histamine-induced symptoms
- Eye symptoms
- AR plus asthma

• Topical Nasal Decongestants:

- Nose is completely obstructed
- Vasoconstriction, increase the nasal airway, medicamentosa



Oral Corticosteroids

- Symptoms are extremely severe
- Brief use only is necessary
- Injectable corticosteroids have an adverse risk profile and should not be used

• Eye Symptoms

- INS
- Cromoglycate , antihistamine eye drops >3 years
- Olopatadine (mast cell stabilizer)
- Severe eye symptoms, vernal conjunctivitis ophthalmological opinion
- Corticosteroid eye drops , herpetic keratitis



Name of the document | month year | page 37

Allergen Specific Immunotherapy (ALT):

- Avoidance of environmental allergens impossible
- Daytime activity and sleep impairment
- Increased risk of allergen induced asthma
- Seasonal pollen allergies , perennial allergies
- At the latest after 2 years of allergic symptoms
- Pharmacotherapy controls symptoms
- ALT lead to symptom reduction
- Alter the course of disease
- Less need for medication
- Treatment over 3 years
- Long term tolerance lasts for years, even after AIT is discontinued
- SCIT and SLIT local side effects , severe systemic adverse reactions
- Oral -IT is safe >5th year of life
- Robust clinical effects of SLIT and SCIT



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