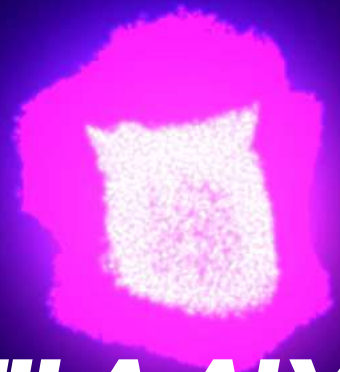
ALLERGIC RHINITS



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SPRING 1404

AR DEFINITION?

- ***Allergic rhinitis (AR) is defined as a chronic, waxing/waning, immunoglobulin E (IgE), based inflammation in the nasopharynx , response to environmental proteins.***


• The most common immunological disease
• 50 % in some countries
• Reduce quality of life and affect on sinus ear, chest, sleep problem and school performance and outdoor activity

- ***AR predispose to asthma and reduce asthma control***

- ***ISAAC in 15 years: increase prevalence (environment – fast food)***

- ***AR is very low in the 1st 2 y/o***
- ***Two years seasons allergen exposure needed to be sensitized***

- *New case 2%/year in 3-12 y/o*
- *+ f. hx (father or mother) : the best predictor*

- ***Allergic sensitization: predict hay fever in next 3 years (OR 13.6)***
- ***Allergic conjunctivitis in 60%***
- ***50% wheeze***
- ***Atopic dermatitis***
- ***Boys earlier – girls higher incidence in puberty – by age 20y/o : equal***
- ***If polyp: prompt test for CF***

AR, SIGN?

Typical symptoms :

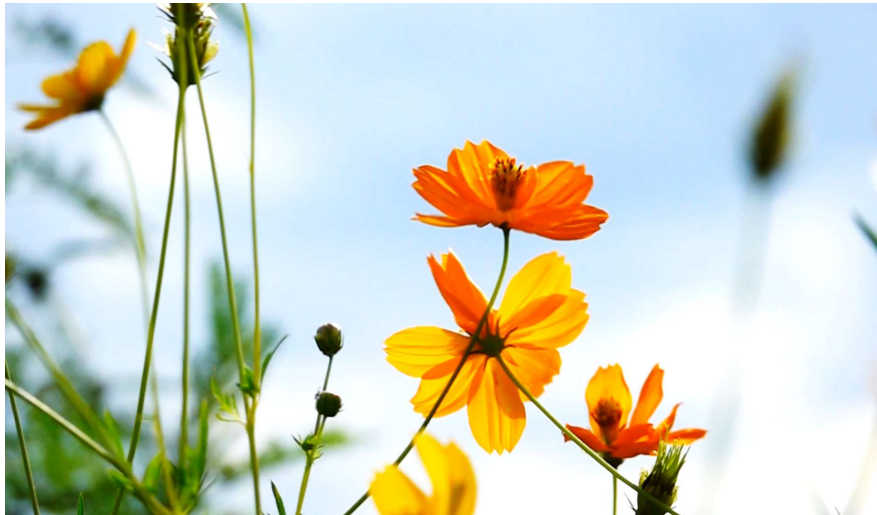
nasal congestion, rhinorrhea (anterior and/or posterior), sneezing, and itching.

When ocular symptoms: allergic rhino-conjunctivitis

- **common**

incidence :10% and 30% of children and adults in the US & developed nations.

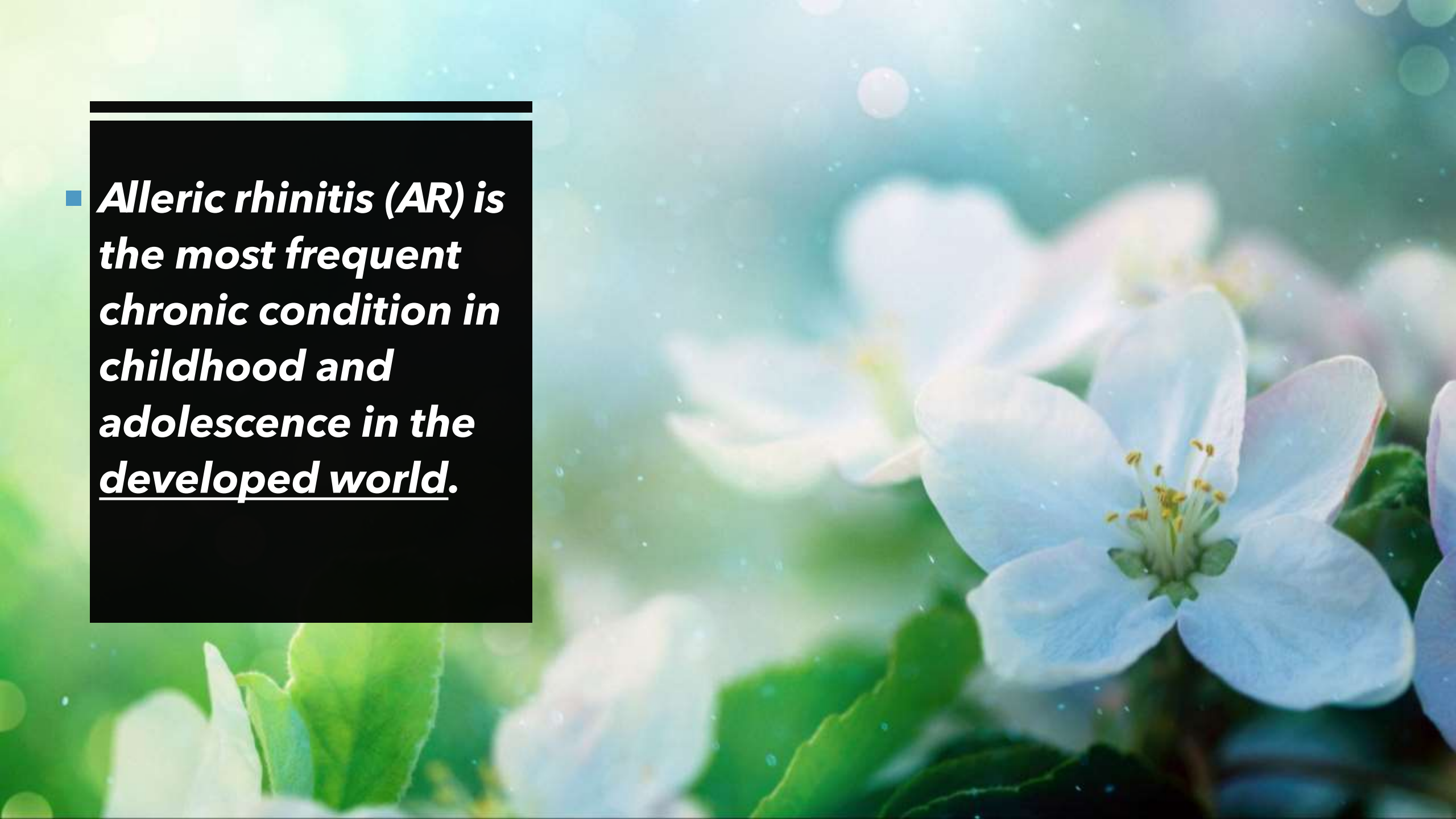
- **physician-diagnosed AR : 13% in children**



Immunol Allergy Clin N Am

- *AR symptoms before 20 y/o*
- *Half : symptomatic by age 6 years*

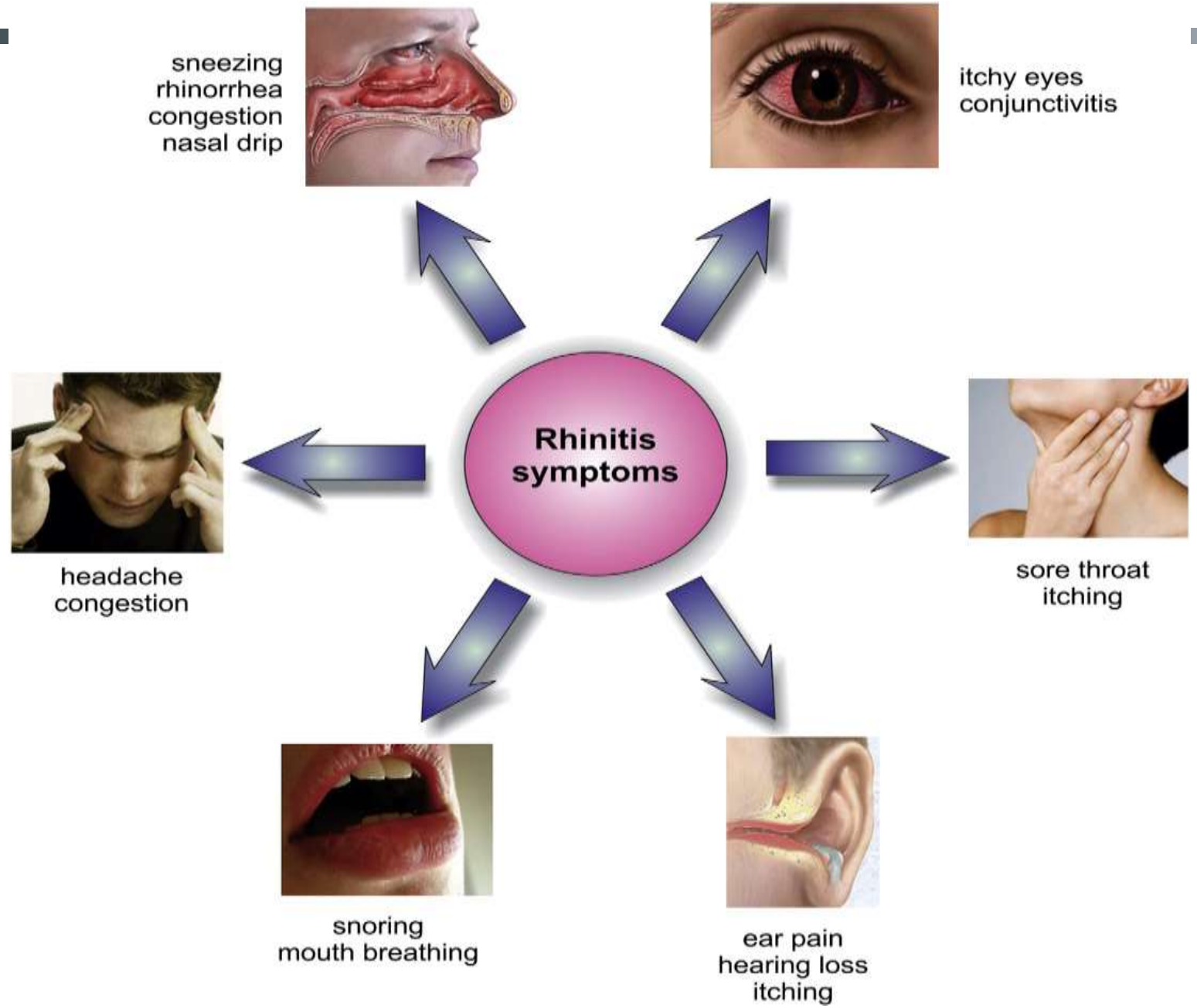
- *So : a disease of childhood that can present early in development*



- ***Alleric rhinitis (AR) is the most frequent chronic condition in childhood and adolescence in the developed world.***

BURDEN OF DISEASE

- *Fatigue, attention, learning, and memory deficits, and even depression.*
- *Nasal obstruction : sleep- disordered breathing*
- *AR : 2-fold increase in medication costs & 2-fold increase in physician visits*
- *adolescents with AR and ARC have worse quality of life, (obstruction -daily functioning _ sleep)*
- *attention-deficit/hyperactivity disorder (ADHD),,Treatment of AR reduces ADHD symptom scores*


sneezing
rhinorrhea
congestion
nasal drip
itchy eyes
conjunctivitis
Rhinitis symptoms
headache
congestion
sore throat
itching
snoring
mouth breathing
ear pain
hearing loss
itching

- ***38%-50% of patients with AR had asthma,***
- ***and about 78% of patients with asthma had AR.***

AR, RISK FACTORS ?

- Family history of allergic diseases,
- Male sex,
- Birth during the pollen season,
- Firstborn status,
- Elevated serum IgE levels (>100 IU/mL) before age 6
- Antibiotic use,
- Maternal smoking,
- Indoor allergen exposure,
- Presence of any allergens

- ***A typical history of AR includes symptoms of sneezing, rhinorrhea, nasal obstruction, and nasal itching.***

- ***Other common symptoms include cough, postnasal drip, irritability, and fatigue.***

- ***Palate and mid. ear itching***.

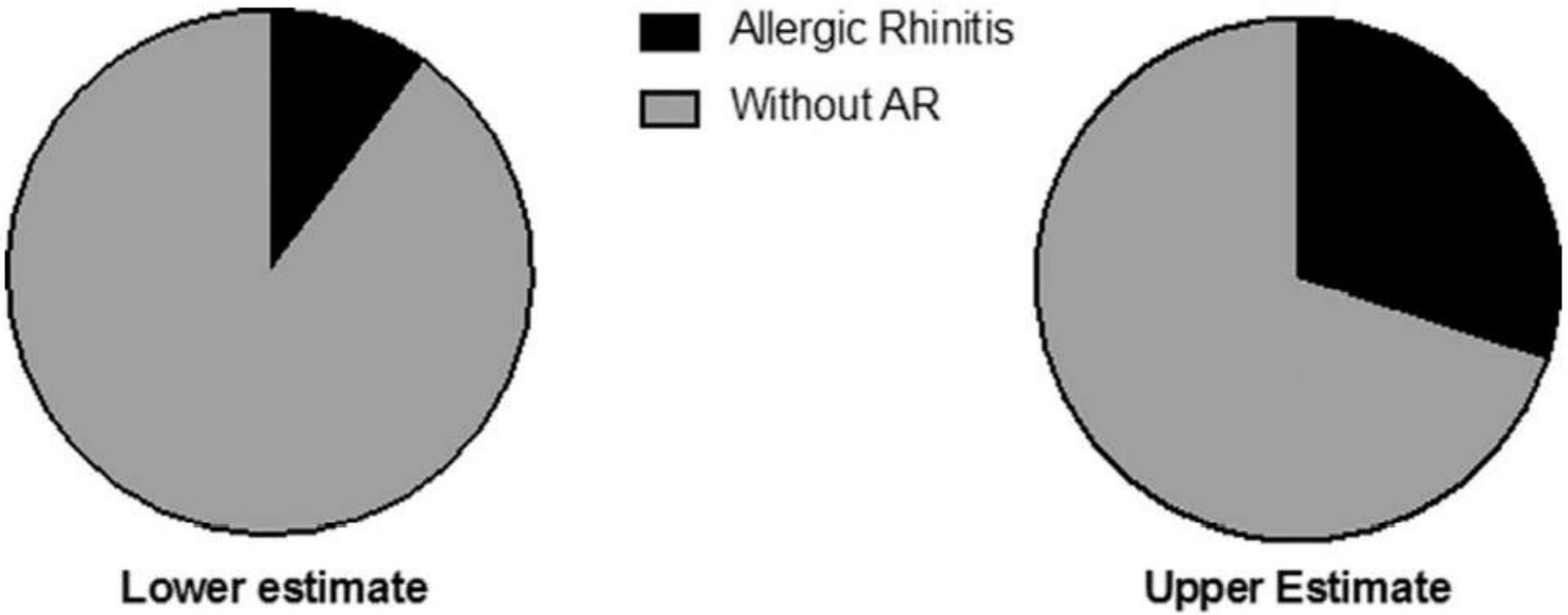


Fig. 1. AR prevalence estimate range worldwide in developed countries.

- ocular symptoms,:itching, tearing, and burning.

- Younger children : snoring or sniffing, throat clearing, and cough (cough variant rhinitis).
- To scratch an itchy palate : clicking sound
- Symptoms may be present year-round or seasonally

QUALITY OF LIFE

- *Self-esteem*
- *Achool performance*
- *Absent., loss of work*
- *Concentration*
- *Learning*
- *Sleep ,Fatigue*
- *Irritability , memory , depression, sleepy, shy, anxious*

Intermittent

- Symptoms <4 days/week *or* <4 consecutive weeks

Persistent

- Symptoms >4 days/week *or* >4 consecutive weeks

Mild

- Normal sleep
- No impairment of daily activities, sport, leisure
- Normal work/school
- No bothersome symptoms

Moderate-Severe

- Abnormal sleep, or
- Impairment of daily activities, sport, leisure, or
- Problems at work/school, or
- Bothersome symptoms

-ALLERGIC RHINITIS : INTERMITTENT OR PERSISTENT

- INTERMITTENT AR : SYMPTOMS PRESENT <4 WEEKS,<4 DAYS /WEEK.
- PERSISTENT AR: >4 WEEKS , >4 DAYS / WEEK.

SEVERITY OF AR:

A. MILD: DOES NOT MEET CRITERIA

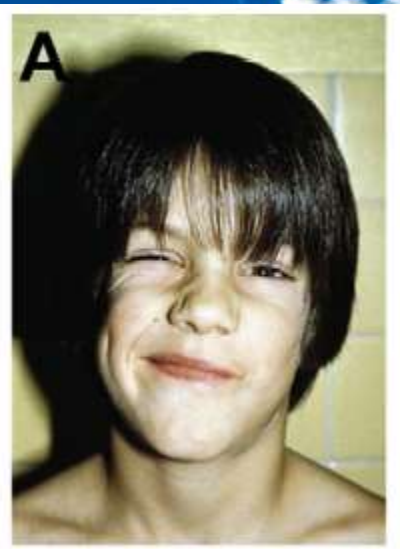
B. MODERATE/SEVERE: MEETS ONE OR MORE OF

CRITERIA: I. SLEEP DISTURBANCE

II. IMPAIRMENT OF SCHOOL/WORK PERFORMANCE

III. IMPAIRMENT OF DAILY ACTIVITIES, LEISURE, OR SPORTS INVOLVEMENT

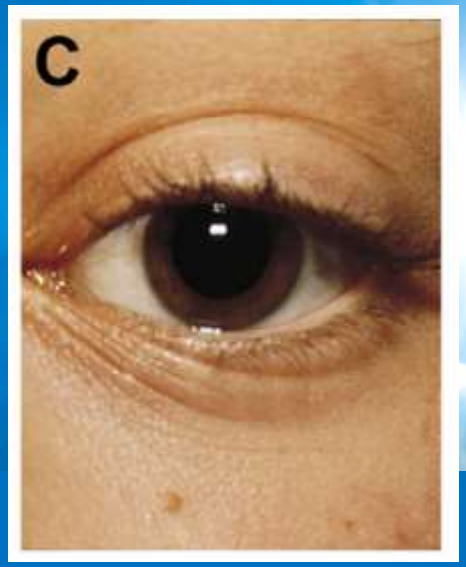
IV. TROUBLESOME SYMPTOMS



P. EXAMINATION

I. ALLERGIC SHINERS:

-INFRAORBITAL EDEMA FROM VENO DILATION : BLOOD VESSEL CHANGES (ALLERGIC INFLA).



II. DENNIE-MORGAN LINES:

-INCREASED FOLDS OR LINES BELOW THE LOWER L.

-. THE PATHOPHYSIOLOGY ?

- SOME ETHNIC GROUPS COUT AR

P. EXAMINATION

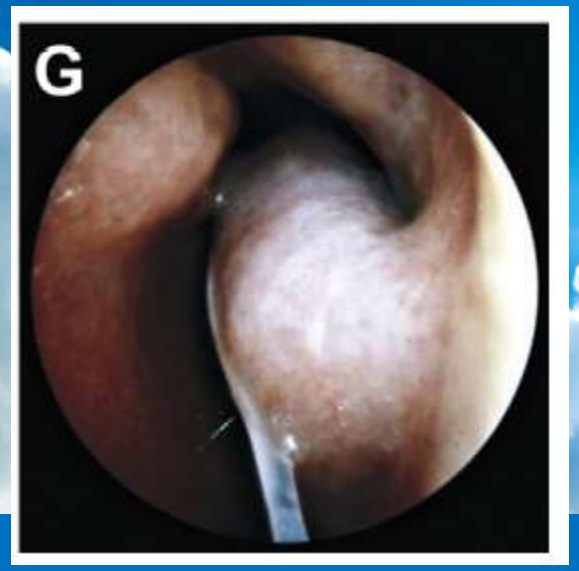
I. ALLERGIC SALUTE:

NASAL ITCHING : REPEATED RUBBING OF THE NOSE.
-PUSHING THE TIP OF THE NOSE UP WITH THE HAND LEADS TO A TRANSVERSE NASAL CREASE.

IV. ALLERGIC FACIES:

-HIGH ARCHED PALATE, MOUTH BREATHING, AND DENTAL MALOCCLUSION-

-SEEN IN CHILDREN WITH EARLY-ONSET AR.



V. NASAL MUCOSA: WITH ANTERIOR RHINOSCOPY,
THE NASAL MUCOSA :PALE AND BLUE COLORED WITH TURBINATE EDEMA.
CLEAR RHINORRHEA

-COBBLE STONING: THE POSTERIOR OROPHARYNX MAY DEVELOP HYPERPLASTIC LYMPHOID T.
- TM: RETRACTION OR SEROUS FLUID ACCUMULATION. :NASAL MUCOSAL SWELLING AND EUSTACHIAN TUBE DYSFUNCTION.

In practice, AR : seasonal and perennial subtypes, because

- *relate to the allergic sensitizations specific to the patient.*
- *- **Persistent or perennial symptoms** more **common** than isolated seasonal symptoms*

- *a mixed picture: persistent symptoms + seasonal exacerbations, is quite common*

- Seasonal triggers :pollens and molds.
- Tree, grass, and weed species that pollinate via wind-based pollen distribution.
- Insect-pollinated plants are not a cause: of the lack of diffuse airborne pollen dispersal in these plants' life cycles.
- Some colloquial names for seasonal allergies identify times of the year with an event, but the name may not identify the actual culprit pollinating species.
- For example: rose fever. :summer when rose blooming , but related to pollinating grasses.
- Or: hay fever. : fall in hay harvest. : mold growing on the hay or weed pollens disseminated during the fall that contribute to rhinitis

Figure 2-1. Cloud of pollen released from a juniper tree.

Figure 2-8. English plantain. This plant pollinates duri
same season as the grasses. It can trigger allergic rhiniti
some individuals, which may be confused with an aller
response to grass pollens.

Figure 2-11. Lamb's quarter (*Chenopodium album; A*) and pigweed (*Amaranthus retroflexus; B*). The microscopic similarity between the pollen grains of these two plants has led to their classification under a combined family name of chenopod-amaranth.

Figure 2-12. *A,* Timothy grass as it appears in the field. *B,* Closer view showing detail of the timothy grass plant, which is widely cultivated as hay. (Courtesy of Hollister-Stier Laboratories.) *C,* Timothy grass pollen. Oil emersion photomicrograph, 450×. (Courtesy of Greer Laboratories.)

Figure 2-14. Bluegrass *(A)*, Redtop grass *(B)*, and perennial ryegrass *(C)*. Though allergenically distinct, these three grasses show considerable cross-reactivity. (*A* and *B*, courtesy of Greer Laboratories.)

Figure 2-15. Bermuda *(A)*, Johnson *(B)*, and salt grasses *(C)*. These three plants have long seasons in the sub-tropic regions and tropical regions of the world. (*A* and *B*, courtesy of Hollister-Stier Laboratories.)

Figure 2-16. Birch *(A)*, ash *(B)*, maple *(C)*, and red maple *(D)* trees in spring bloom in the Northern Hemisphere. Pollens from these trees begin to reach peak levels in the very early spring. (Courtesy of Hollister-Stier Laboratories.)

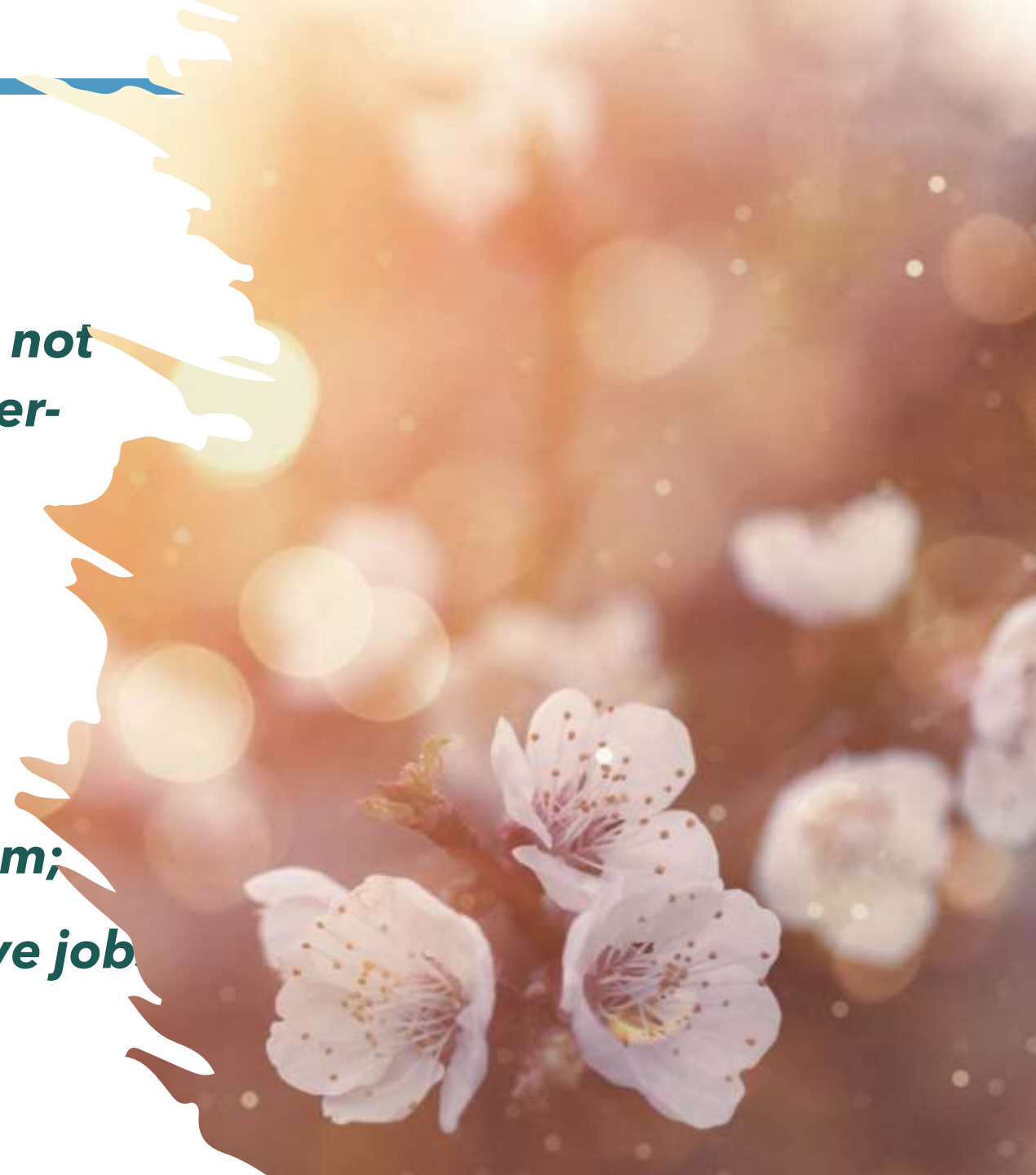
Figure 2-18. Mountain cedar. This is one of the conifers that causes allergic responses in sensitive people. (Courtesy of Hollister-Stier Laboratories.)

LOCAL ALLERGIC RHIINITS

- *Absence of systemic atopy*
- *Perennial or seasonal but skin prick test is –ve*
- *+ve nasal provocation test(not routinely available)*
- *Evolution to AR?*
- *But allergen immunotherapy may be effective*

ALLERGIC RHINITS

- ***OCCUPATIONAl Rhinitis: AR IN work place not outside of work (food processing-farmer-industries)***
- ***During 1st 2 years***
- ***Irritant or allergen***
- ***Several hrs or immediately***
- ***Often with ocular & pulmonary symptom;***
- ***If symptom controlled : no need to leave job***



DX

- AR is a long standing & under-diagnosed disease
- Screen of AR in asthma
- HX- PE
- Personal: itching –rhinorrhea – sneezing- eye-
- allergen & triggers
- Family: allergy & asthma
- Environment :pollen- animal- mold- humidity- tobacco or cannabis
- Drugs : beta blocker- ASA- NSAIDS- ACE inhib.- cocaine
- Comorbidity: asthma- mouth breathing – snoring- smell-sinus-OM- polyp
- Response to previous tx-
- Avoidance – saline irrigation- antihistamines- INCS- OCS

AS HISTORY AND EXAMINATION, SPECIFIC IGE POSITIVITY MAY BE HELPFUL.

SPECIFIC IGE IS INDICATED WHEN :

-TO ESTABLISH AN ALLERGIC CAUSE FOR THE PATIENT'S SYMPTOMS,

-TO EXCLUDE SPECIFIC ALLERGIC CAUSES FOR A PATIENT'S SYMPTOMS,

- OR TO DETERMINE SPECIFIC ALLERGEN SENSITIVITY TO GUIDE AVOIDANCE MEASURES OR IMMUNOTHERAPY

SKIN TESTING TO SPECIFIC ANTIGENS : SAFE , WITHIN 20 MINUTES ,GOOD SENS. & SPECIF..

SPT IN CHILDREN BECAUSE OF THE-

- RAPID RESULTS (20 MINUTES),

- LACK OF NEED FOR BLOOD – FAST RESULT

-MORE THAN 75% OF AR CHILDREN DEVELOP CONCOMITANT CONDITIONS, INCLUDING :

-CONJUNCTIVITIS,
- ASTHMA,
-ATOPIC DERMATITIS,
-RHINOSINUSITIS,
-OTITIS MEDIA WITH EFFUSION (OME),
OR ADENOID HYPERPLASIA (AH),

- INDICATING AR IS NOT AN ISOLATED CONDITION, BUT IT IS PART OF A SYSTEMIC DISEASE

- *Allergic rhinitis multimorbidity*

NASAL OBSTRUCTION

-CORE SYMPTOM

- *SEPTAL DEFORMITY – TURBINATE ENLARGEMENT- ADENOID HYPERPLASIA

-SEPTAL DEFORMITY

-- ONE OF THE MOST COMMON CAUSE OF NASAL OBS.

- ONE OF THE MOST COMMON CAUSE OF ANATOMI. DISORDER IN THE HUMAN

ADULT & CHILDHOOD

REFRACTORY ALLERGIC RHINITIS : SEPTAL DEVIATION

- *Inferior turbinate is initial point of*

allergen deposition: inflammation cascade:

changes :nasal congestion & obstruction

- *In allergic rhinitis : turbinate enlarge. : hyperplasia. Dilatation, inflammation , fibrosis*
- *Refractory to AR treatment : inflammatory mediator: inflammatory epithelium: irreversible fibroblast in I .turbinate + decrease corticosteroid reach to nasal cavity*
- *Turbinoplasty (obstruction, sneezing ,itching , hyposmia)*
- *Safe in children*
- *Intranasal corticosteroid should continue (recurrent)*

TURBINATE ENLARGEMENT

ADENOID HYPERPLASIA

- *Up. airway persistent inflammatio*
  : lymphoid hyperplasia :

  adenoid enlargement

- *in adenoid:*

  lymph.cell – E- synthesis sIgE

- *Resistant AR to treatment*

(controversy)

CHRONIC RHINOSINUSITIS

chronic rhinosinusitis in children:

inflammation of nose and paranasal sinus with at least 2 symptom :

-one (should) nasal congestion or discharge with facial pain and /or loss of a smell

and/or cough during 12 weeks

- And :endoscopic sign or CT change(sinus involvement)

-relation between CRS& allergy : controversial

When the primary organ is not known, such as in allergic diseases, the term multimorbidity should be used instead of comorbidity [17]. Although there have been significant improvements in delivery of care for allergies, many quality improvement activities, clinical guidelines, and innovations have focused on the needs of patients with single allergic conditions. However, multimorbidity is increasingly prevalent, and represents a major part of the workload of AR management (Table 1)

Loss of smell in allergic rhinitis

- *50 to 60%*
- *causes*

1 : N. obstruction: difficulty ; particle to reach olfactory nerve

2 : mucosal inflammation (local Medication)

- *more severe with longer duration*

AR & ASTHMA

- childhood asthma: AR
- AR & Non-AR related to asthma
- Poor controlled AR: asthma
- asthmatic adult : 90% allergic rhinitis

1-United airways

2- loss of nasal function (purify, humidified, heated)

3- Nasal bronchial reflex (irritant –Allergan- cold)

4- ICAM increase inflammation: rhinovirus

- *allergic March : natural history of atopic disease, different symptom but Identical pathway, related to patients' age*
- *food allergy : atopic dermatitis : allergic rhinitis : asthma*
- *children age 4 year old with one allergic disease: 4 to 8 times: two or more allergic disease at 8 year*
- *Family history :Gene of filaggrin : cutaneous barrier: environmental exposure : evolution of allergy*

ALLERGIC MARCH

ATOPIC DERMATITIS

- *prevalence 0.3 -20 % in children*
  -increase
  45% 6-m/o, 60% 1st year, 85% before 5-y/o
  - the best predictor of asthma: sIgE to aeroallergen, foods

  The best predictor of AR: f. history- early onset AD-
- *skin barrier disturbance: early A. dermatitis : casual role in in sensitization & AR & asthma*
- *neonatal emollient : reduce A. dermatitis, allergic rhinitis & asthma & food allergy in the future.*
- *A. dermatitis an early step in the evolution of allergic March: food and respiratory allergy via epicutanous allergen sensitization*
- *Pollen allergies, increased with age, but allergies to mites and pet more frequent in younger :exposure due to defective skin barrier*

- ***SENSITIZATION: Intestine- skin***

- *In AD : peanut emollient : peanut allergy*
- *1-In mice : early feeding with food allergen : food tolerance*
- *2-Exposure of inflamed skin to food allergen can cause sensitization : allergic GI Rx when the food eaten(the double exposure hypothesis)*
- *3-In mice : epicutanous sensitization to avalbumin: bronchial eosinophilia after ovalbumin inhalation*
- *4-Sensitization to food can develop through respiratory route*

, Children who never ingested peanut and shrimp: asthma in inhaled these food particles

, Baker asthma

ALLERGIC CONJUNCTIVITIS

- *ocular surface is the most exposed mucosal membrane of body*
- *5-33% of allergic conjunctivitis is exist with allergic rhinitis*
- *allergic response may be generated in conjunctive or nose(anatomical relation)*

OTITIS MEDIA WITH EFFUSION

- ***Atopy and allergic rhinitis : risk factors for OME***

- ***cause: inflammation in Eustachian tube,***
  tubular dysfunction,
  United airways,
  middle ear mucosa


IS IT
JUST
ME?


AR: ENT referral :
• bleeding
• unilat
• high crust
- marked septal deviation
• perforation

AR: INVESTGATION

- INCS used as diagnostic tool
- SKIN prick test
- Immunocap
- Interpretation is related to hx

(false -ve, fasle +ve)

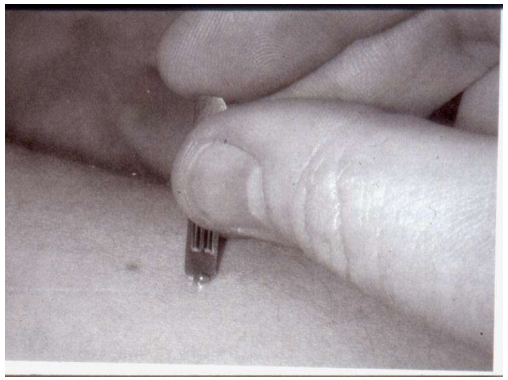
(SPT sensitivity 68-100%

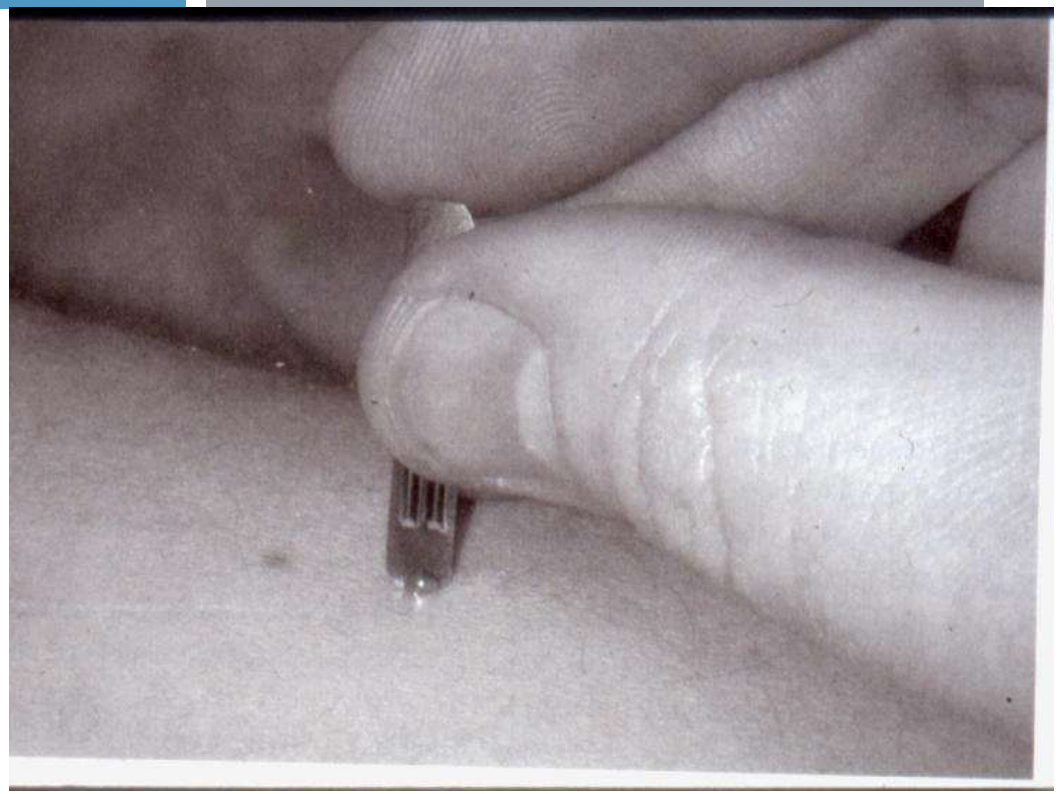
- specifity 70-90%)

DIAGNOSTIC TESTS

Skin prick test

- Wheal & flare (pollen- animals – mold- mite)
- In vivo test, allergen specific IgE test : RAST , in patient with skin damage or on AH
- SPT is mor sensitive
- *SPT for foods and sinonasal imaging is not recommended





Fresh fruit can be used for skin prick testing for fruit alle

Cross reactivity between birch pollen and apple in patient
springtime hay fever and oral allergy syndrome after ingesti

AR: AVOIDANCE

- Indoor allergens& irritant :
  smoke- fuel- dust-
  chemical- sprays- cleansing
  products- pet - mold-
- Bedding cover
- HEPA filter
- Poor ventilation:

- non allergenic green plants:
help to mitigate pollutant effect

Nonsedating H_1-antihistamine (oral, intranasal, and ocular), leukotriene receptor antagonists, or cromones (intranasal and ocular)
INCSs
INCSs + intranasal azelastine
Oral corticosteroid as a short course and an add-on treatment
Consider referral to a specialist and allergen immunotherapy

- ANTIHISTAMINES 1ST GENERATION ARE NOT WELL CONTROLLED: BEHAVIOR DISTURBANCE & PSYCHOMOTOR RETARDATION
- NL/S IRRIGATION UNIVERSALLY RECOMMENDED FOR ALL AGES,

, REGULARLY OR POST ALLERGEN EXPOSURE

(SEA WATER OR MILD HYPERTONIC S. ARE MORE EFFECTIVE)

STERILE SALINE IRRIGATION, NO POTENTIAL SIDE EFFECT(BOILED TAP WATER)

- 2ND GENERATION AH. DESLORATADINE- FEXOFENADINE- LORATADINE- CETIRIZINE- *BILASTIN- *RUPATADINE,

-BEFORE OR DURING THE TIME OF ALLERGY

-1ST GENERATION AH: EFFECT ON COGNITION AND FUNCTION

PEDIATRIC AR MANAGEMENT

- *Education- avoidance- saline nasal douching*
- *2 or more nasal symptoms: AR: non sedative oral or nasal AH: INCS*
- *Nasal congestion : INCS*
- *Sever AR ,nonresponsive : reevaluate: INCS+*
- *+ INAH(6y/o)*
- *+ oral AH in < 6 y/o*
- *+_add on therapy*
- *immunotherapy*
- *Add on therapy: LA (asthma)*

-skin rash: oral AH-

sudden onset n. blockage:<7 days, oral/nasal decongestant

PEDIATRIC AC MANAGEMENT

- ***ALLERGIC CONJUCTIVITS :***

  INTRA OCULAR: AH- or cromolyn-

- ***ocular CS ; short cours,5days***
- -

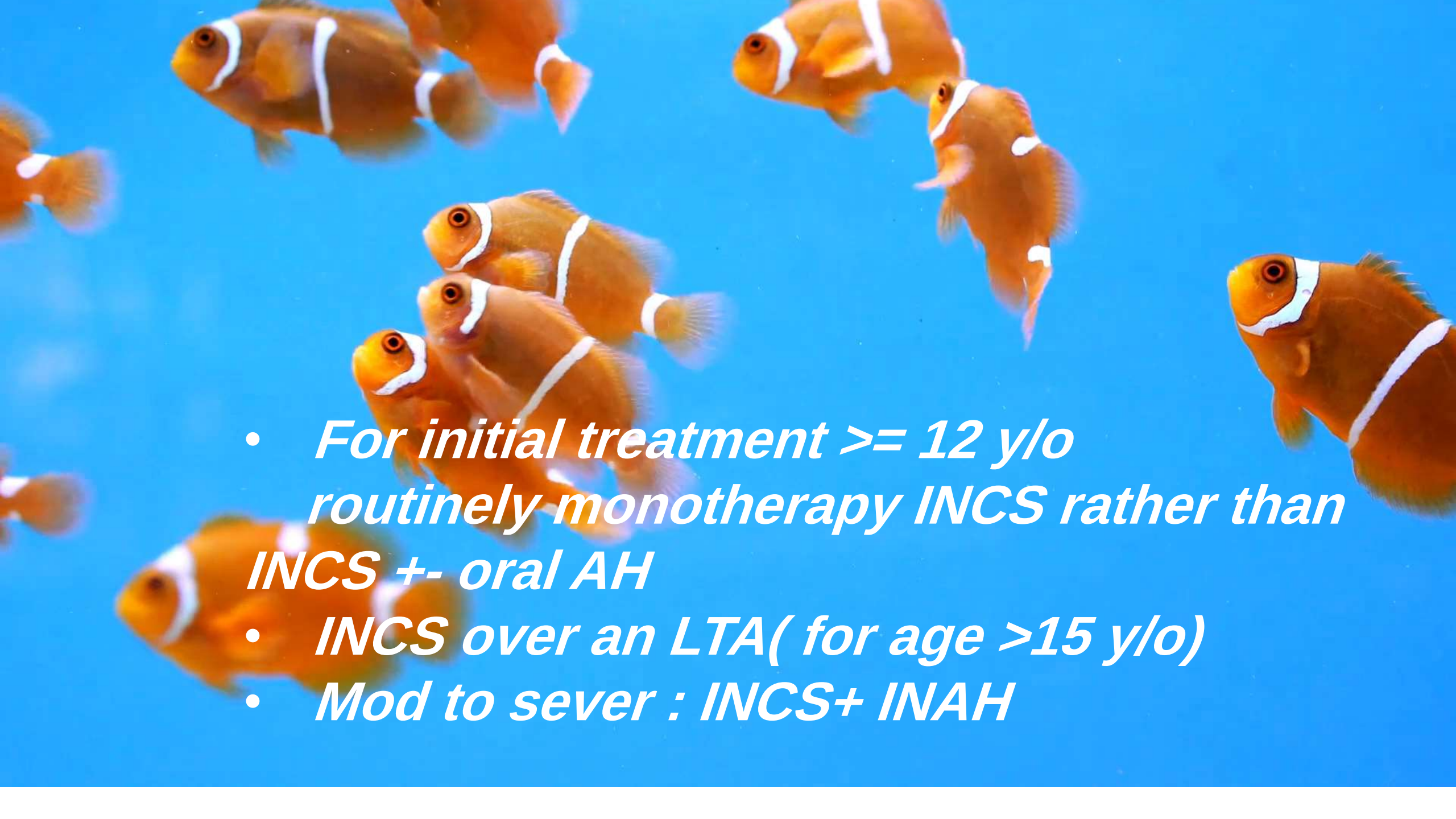
- *If one oral AH fails to control , no point in trying another one*

- *Azelastine is rapid (15) min, olopatadine*

- *INCS: ciclesonide- fluticasone- mometasone: long term using: does not damage nasal mucosa (beclomethasone, triamcinolone: growth retardation?)*

ALLERGIC RHINITIS: TX

- *INCS + OAH: in adult does not increase the efficacy of INCS except for eyes*
- *Anti Leukotriene is similar to AH : wide range of response related to genetic , psychiatric problems - asthma*
- *Decongestant : rhinitis medicamentosa*
- *Oral CS in extreme sever- brief use - no im rout*
- *AC: cromolyn, AH eye drop>3y/o - olopatadine eye drop in pediatric age mast cell stabilizer*
- *Biologic? In sever when no responsive to SIT*
- *Prevention: ? Cohort :dietary modification: no effect*
- *Probiotics : no effect*
- *High butyrate in infant diet : reduces atopy*



- *For initial treatment >= 12 y/o routinely monotherapy INCS rather than INCS +- oral AH*
- *INCS over an LTA(for age >15 y/o)*
- *Mod to sever : INCS+ INAH*

- ***The combination of oral AH with INCS: no more effective***
- ***The combination of INAH+INCS : more effective than INCS alone***
- ***INAH effect: within minutes***

TABLE III. Comparison of the time of onset of action using environmental exposure chambers

Drug (dose)	Formulation	Onset of action
Ontario environmental exposure chamber[38]		
Azelastine	Nasal spray	15 min
MPAzeFlu	Nasal spray	5 min
Fluticasone propionate + oral loratadine (10 mg)	Nasal spray + tablet	160 min
Olopatadine	Nasal spray	90 min
Ciclesonide	Nasal spray	60 min
Budesonide	Nasal spray	8 h
Budesonide and azelastine	Nasal spray	20 min
CDX-313 (solubilized budesonide + azelastine)	Nasal spray	20 min
Levocetirizine	Tablet	160 min
Vienna environmental exposure chamber		
Astemisole-D, Loratadine-D	Tablet	65-70 min
Astemisole, loratadine, terfenadine-forte	Tablet	107-153 min
Azelastine (intranasal), desloratadine	Nasal/tablet	Azelastine: 15 min Desloratadine: 150 min
Bilastine, cetirizine, fexofenadine	Tablet	No assessment before 60 min
Cetirizine-D, budesonide	Nasal/tablet	
Cetirizine-D, xylometazoline nasal spray	Nasal/tablet	

(A)

1. Shake bottle well
2. Look down
3. Using right hand for left nostril put nozzle just inside nose aiming towards outside wall
4. 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

IMMUNOTHERAPY

-SUBCUTANEOUS (SCIT)

-SUBLINGUAL

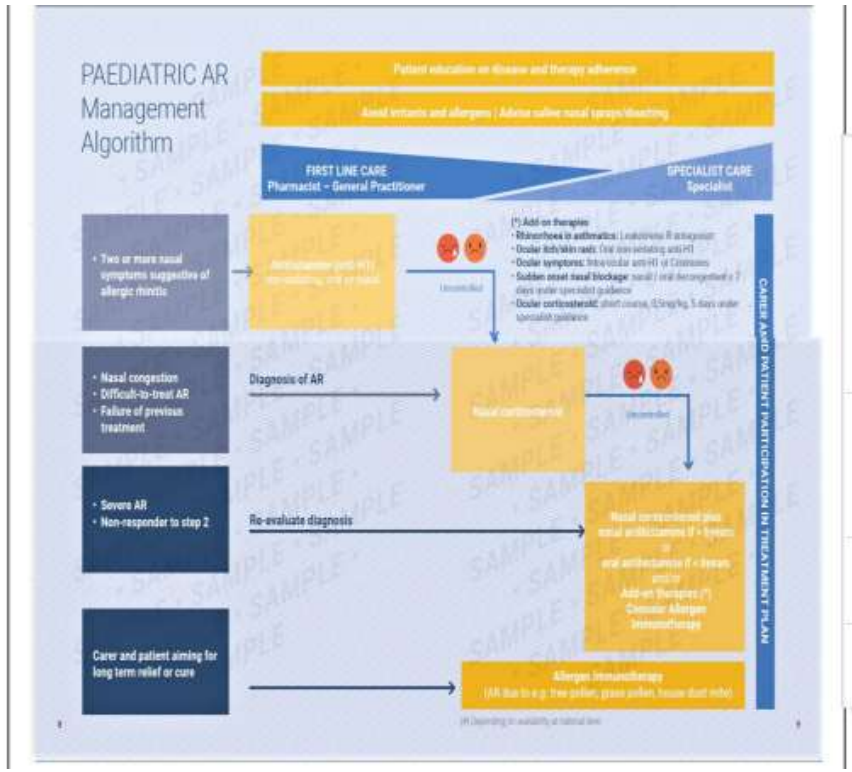
:WHEN DO NOT ACHIEVE SYMPTOM CONTROL WITH PHARMACOTHERAPY

-SEASONAL(POLLEN)

-MITE-ALTERNARIA- COCKROACH- CAT-DOG

-SCIT: WEEKLY INCREASE OVER 6-8 MONTHS, MAX DOSE, EVERY 3-4 WKS,
3-5 YRS

PRE-SEASONAL: 4-12 WKS (ACCESS)?


PAEDIATRIC AR
Management
Algorithm
Patient education on disease and therapy adherence
Avoid irritants and allergens | Advise saline nasal sprays/douching
FIRST LINE CARE
Pharmacist – General Practitioner
SPECIALIST CARE
Specialist
• Two or more nasal symptoms suggestive of allergic rhinitis
(*) Add-on therapies:
• Rhinorrhoea in asthmatics:
• Ocular itch/skin rash:
• Ocular symptoms:
• Sudden onset nasal blockage:
• Ocular corticosteroid:
• Nasal congestion
• Difficult-to-treat AR
• Failure of previous treatment
Diagnosis of AR
Nasal corticosteroid
• Severe AR
• Non-responder to step 2
Re-evaluate diagnosis
Add-on Therapies (*)
Consider Allergen Immunotherapy
Carer and patient aiming for long term relief or cure
Allergen Immunotherapy
CARER AND PATIENT PARTICIPATION IN TREATMENT PLAN

BOX 1 | Rhinitis symptoms are nasal running, blocking, itching, sneezing, all of which are common in children due to viral colds. This Box gives the clues to an AR diagnosis.

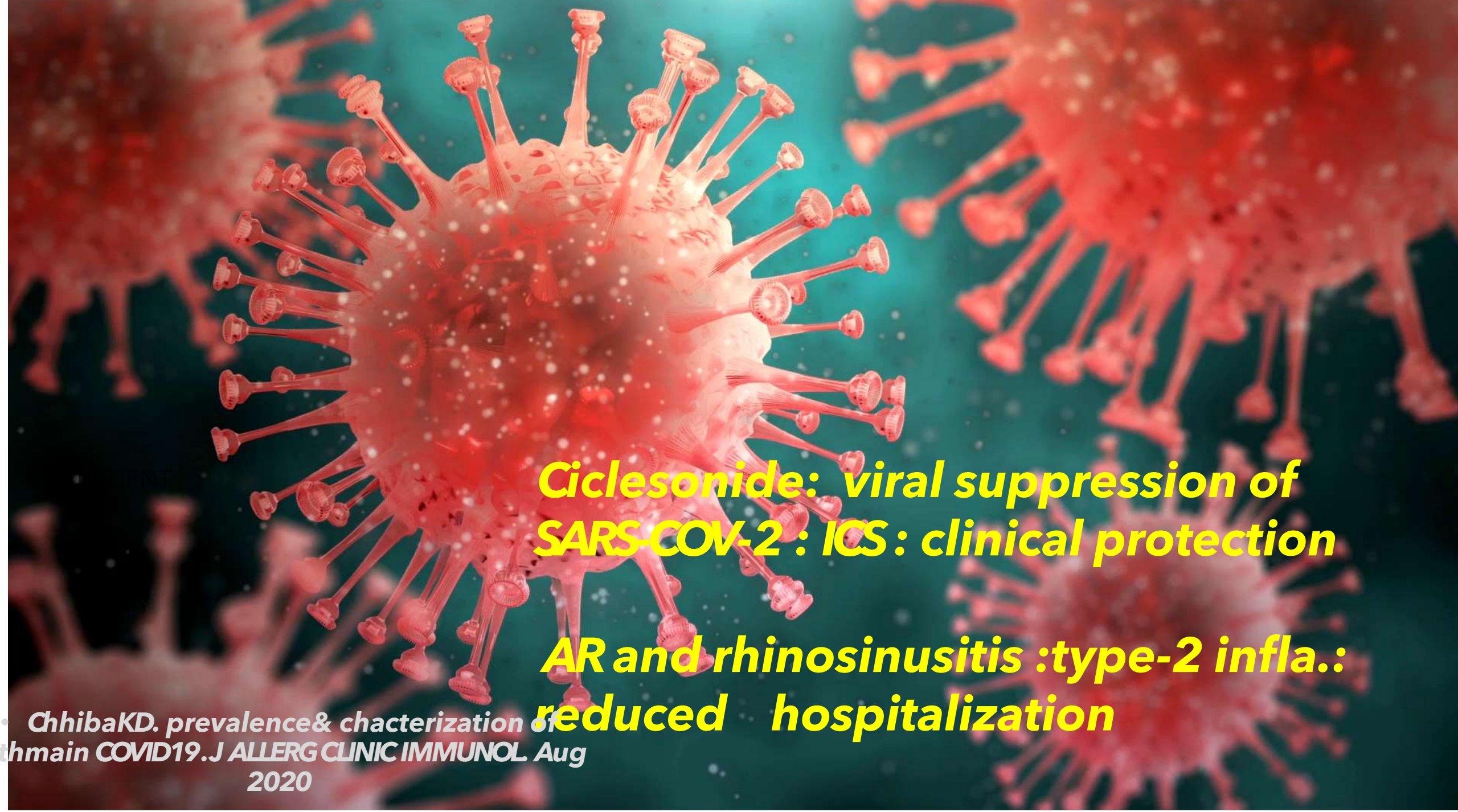
Rhinitis may be allergic if

- The eyes are involved
- Itching is noticeable- child gives allergic salute, has allergic crease
- Exposure to a known allergen reliably causes symptoms
- Personal or family history of other allergic diseases
- Some children present with a comorbidity (asthma, atopic eczema, rhinosinusitis, 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 and vice-versa.

BOX 2 | Red Flags- for specialist attention.

- Children with unilateral symptoms, severe nasal obstruction +- sleep apnoea
- Children under 2 years and those with a history of rhinitis symptoms present continuously since birth (34, 35)
- Children with nasal polyps
- Those refractory to medical management.

FIGURE 7 | A suggested visual analog scale, using emojis, for younger children to express their feelings about their symptoms.



- ChhibaKD. prevalence& chacterization of thmain COVID19 .J ALLERG CLINIC IMMUNOL. Aug 2020