



Frequent co-morbid conditions with asthma

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Comorbidities in childhood asthma

Knowledge is sparse.

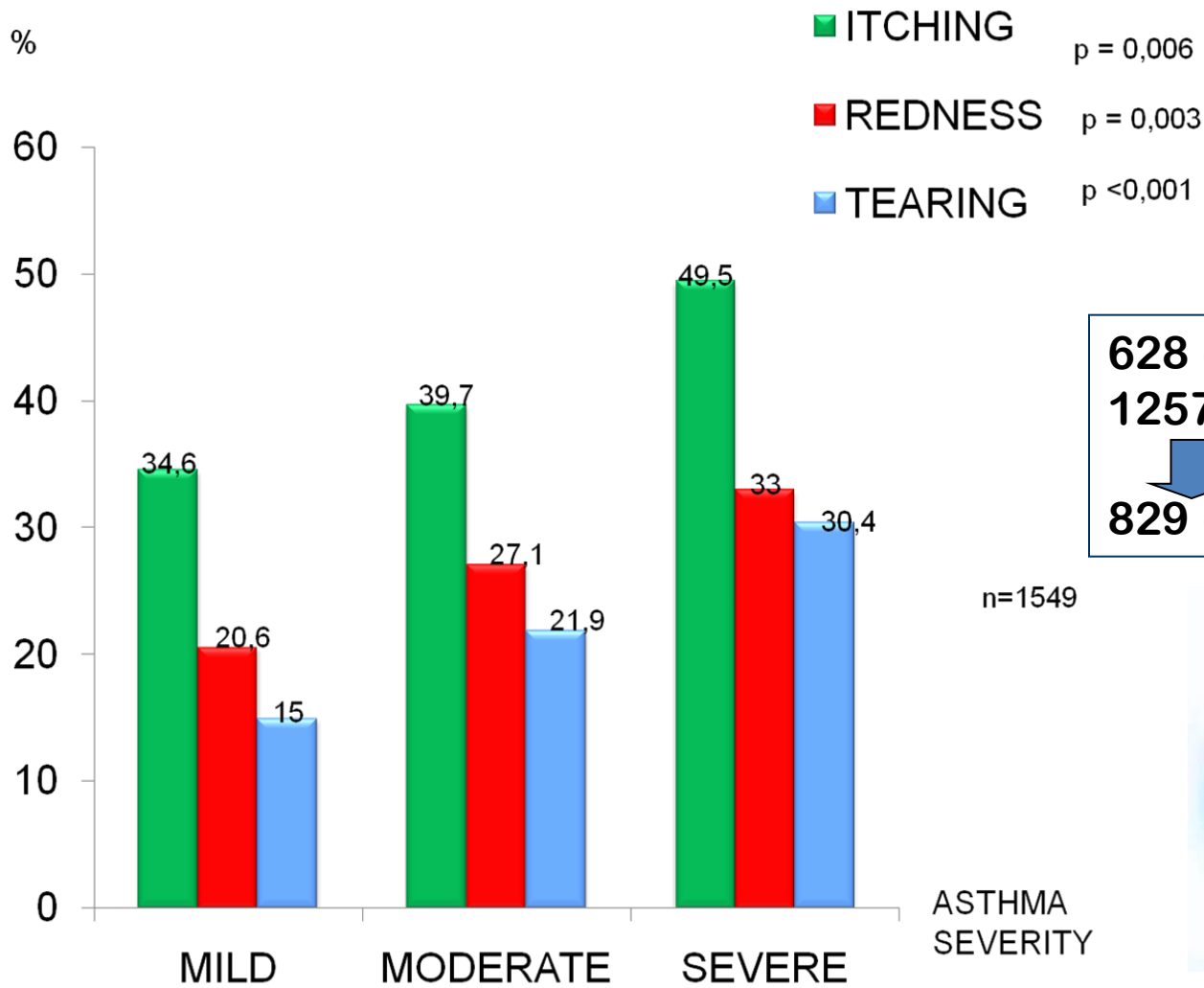
Further studies are needed:

- to identify the prevalence
- the effects of these comorbidities and their treatment on the degree of asthma control in children.

Asthma comorbid conditions

- Share a **common pathophysiological** mechanism with asthma.
- Influence **asthma control**, its phenotype and response to treatment.
- More **prevalent in asthmatics** but without obvious influence on this disease.
- Interaction with A remains to be documented for many of them, particularly for severe A.
- If considered relevant, they should be **treated appropriately**.

Ocular symptoms and asthma severity



628 (41%) ≥ 1 sx of conj.
1257(81%) dx AR
↓
829 (66%) ≥ 1 sx of conj.

ASTHMA
SEVERITY



Diagnostic Probability of Reported Allergic Conjunctivitis in 681 Asthmatic Children With Ocular Symptoms

Ocular symptoms *	Reported conjunctivitis diagnosis, %	Odds ratio (95% CI)	Sensitivity, % (95% CI)	Specificity, % (95% CI)
Itching	37.9	20.2 (13.4–30.4)	89 (85.1–92.8)	71.4 (69–73.9)
Redness	46.9	13.4 (9.8–18.2)	71.7 (66.1–77.2)	84.1 (82.1–86.1)
Tearing	43.8	7.4 (5.5–9.9)	53.1 (47–59.3)	86.6 (84.8–88.5)
Tearing and redness	51	14.2 (10.4–9.4)	67.3 (61.6–73.1)	87.3 (85.5–89.1)
Itching and tearing	49.2	9.0 (6.6–12.2)	50 (43.9–56.1)	90 (88.3–91.6)

*P<0.0001

more than 75% of patients with allergic rhinitis and 20% of patients with asthma have ocular symptoms, such as itching, tearing, and redness Singh K, Bielory L. *Ann Allergy Asthma Immunol.* 2007;98(suppl 1):S1-S125.

1549 asthmatic children (59% male; mean age 4.3 years)

medical record information:

Physician diagnosis of conjunctivitis 15.8%

43.9% had at least 1 ocular symptom that suggested ocular allergy.

Frequency of ocular symptoms

Itching 38.4%

Tearing 19.9%

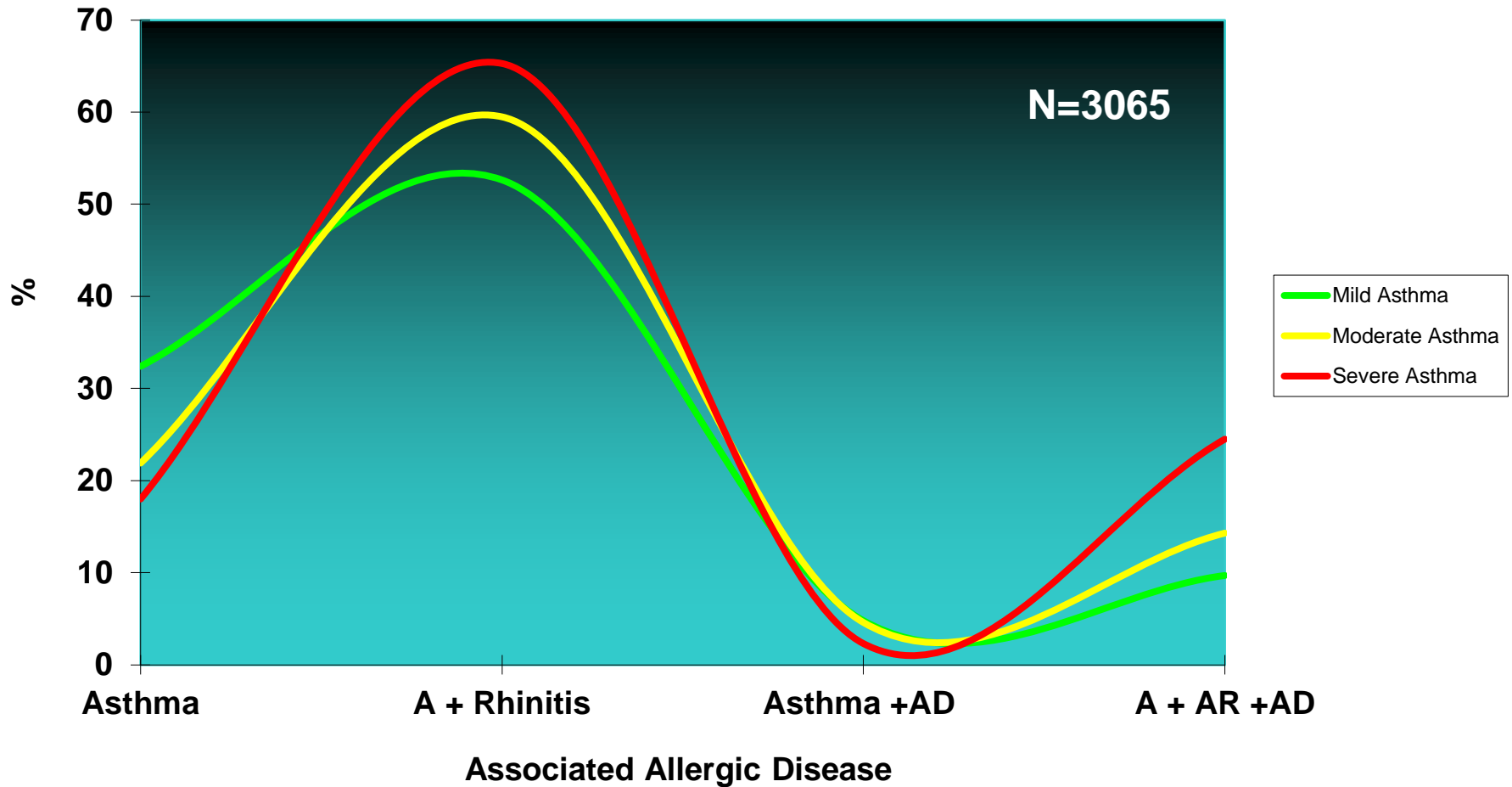
Redness 25%

Combined symptoms:

itching plus redness 21.6%

itching plus tearing 16.6%.

Allergic Diseases and Severity of Asthma



ORIGINAL ARTICLE

Iran J Allergy Asthma Immunol

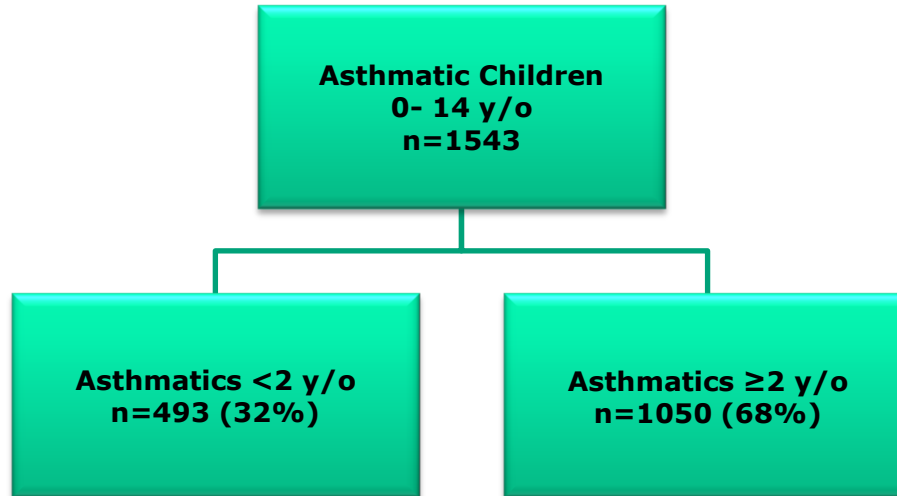
March 2010; 9(1): 21-25

Rhinitis is also Common in Infants with Asthma

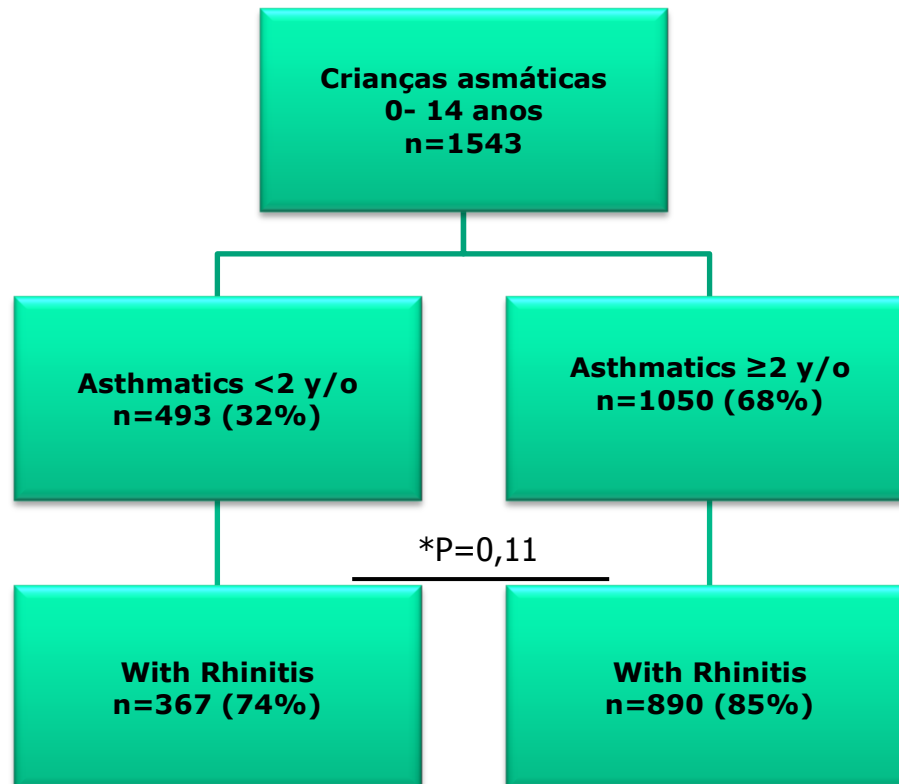
**Herberto José Chong Neto, Nelson Augusto Rosário, Gabriela Cardoso Westphal, Carlos Antônio Riedi,
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Pediatric Allergy Division, Federal University of ParanáCuritiba, Paraná, Brazil

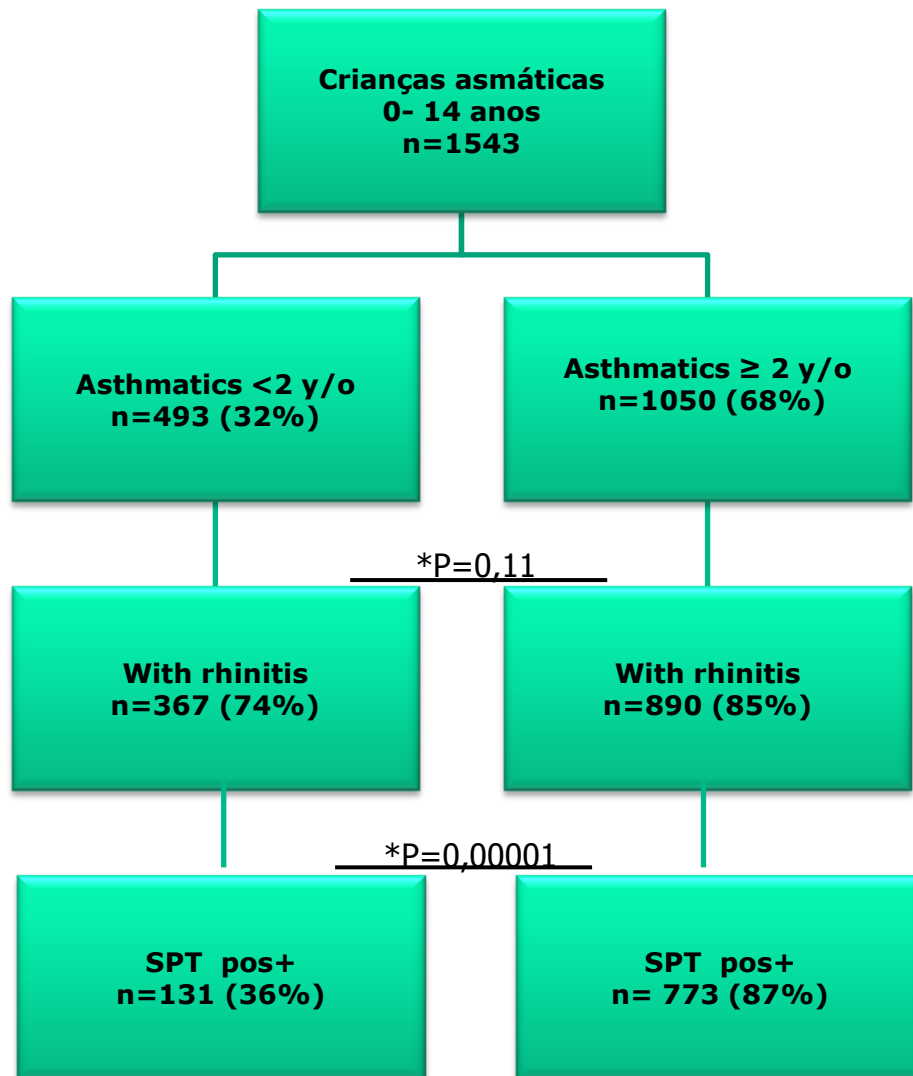
Allergic Rhinitis in Asthmatics Sensitized to ≥ 1 allergen.



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* Test χ^2

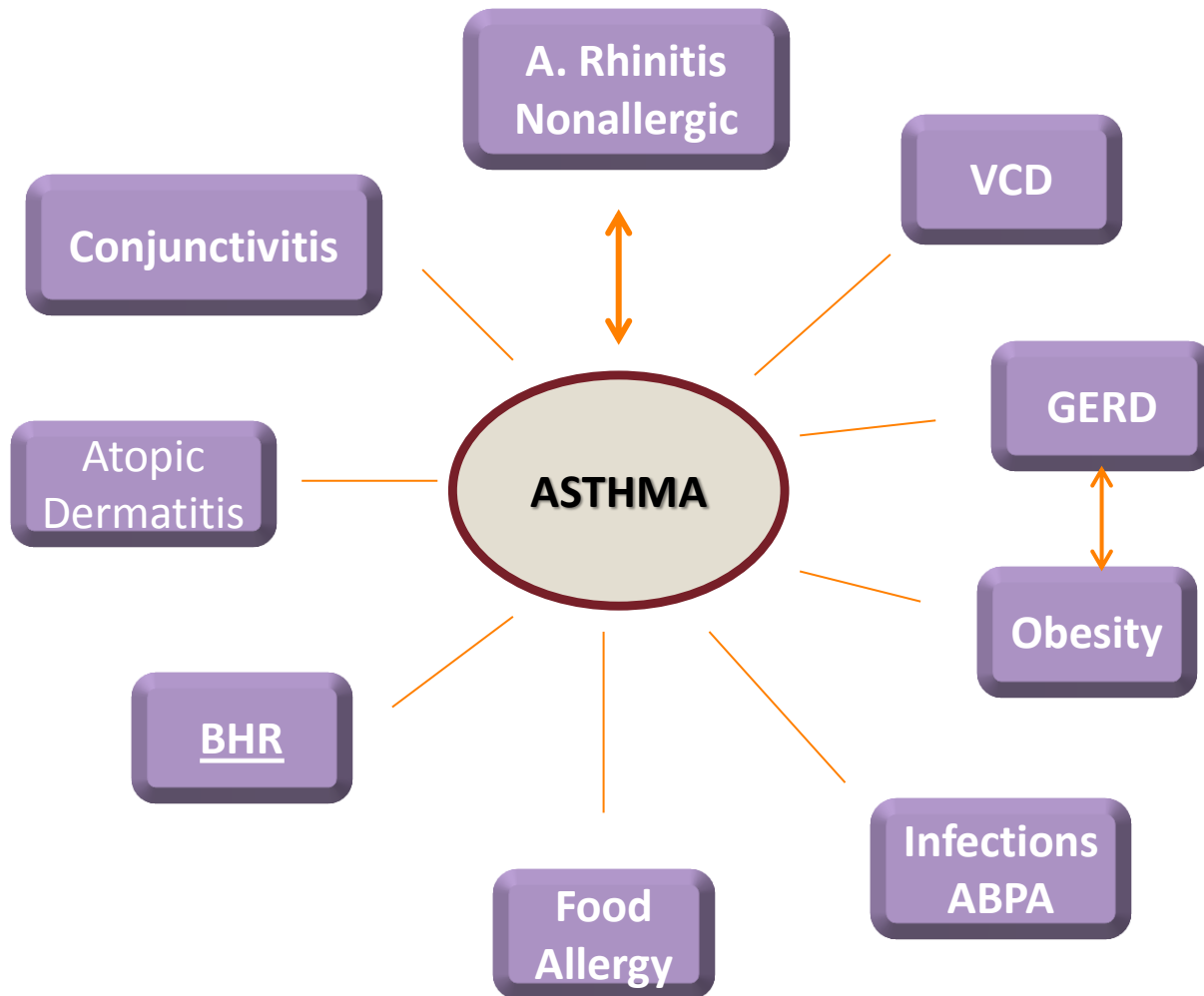
Treatment of recurrent wheezing infants

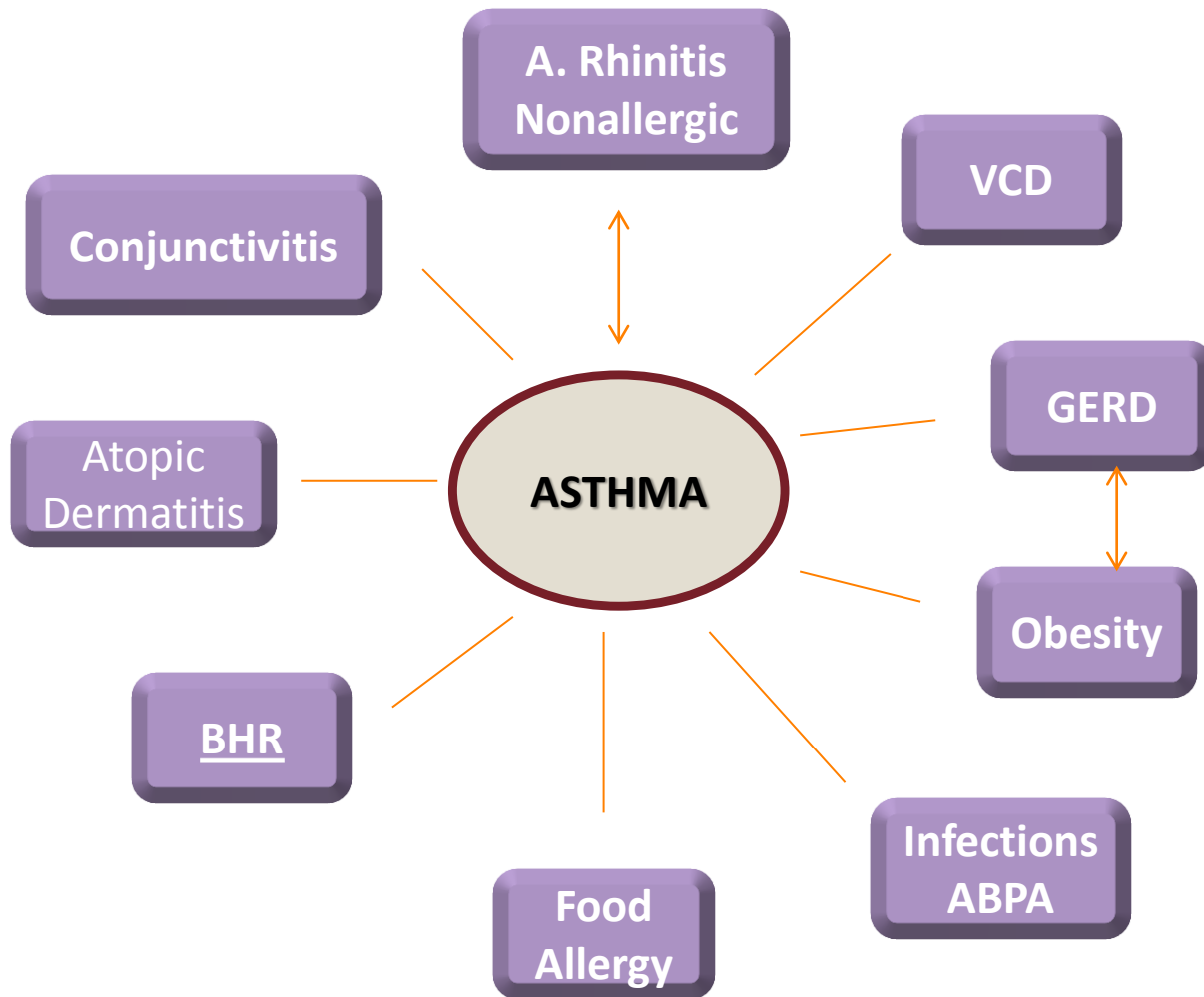
Table I Treatment of infants according to the frequency of wheezing episodes

Medication	≥ 3 episodes n = 678 (%)	< 3 episodes n = 682 (%)	p
Inhaled short-acting β_2 -agonists*	608 (89.6)	539 (79)	0.0001
Inhaled corticosteroids [†]	160 (23.6)	90 (13.2)	0.003
Leukotriene modifiers [‡]	47 (6.9)	26 (3.8)	0.42
Oral corticosteroids	126 (18.6)	109 (16)	0.2

N=1360; 12-15 months old

- A asma inicia-se na infância e pode ser confundida com outras causas de sibilância.
- É possível identificar diferentes fenótipos.
- Associa-se à inflamação, demonstrável por procedimentos invasivos e não-invasivos
- Ocorre remodelamento







Diagnosis of Asthma in Children 5 Years and Younger

Symptom patterns (wheeze, cough, breathlessness) which occur recurrently, during sleep, or with triggers such as activity, laughing or crying are consistent with a diagnosis of asthma.



Diagnosis of Asthma in Children 5 Years and Younger

The presence of atopy or allergic sensitization provides additional predictive support, as early allergic sensitization increases the likelihood that a wheezing child will have asthma.

Airway inflammation in difficult asthma

- Endobronchial biopsy and BAL in 28 children with persistent obstruction despite ICS
- Persistent symptoms vs paucisymptomatic

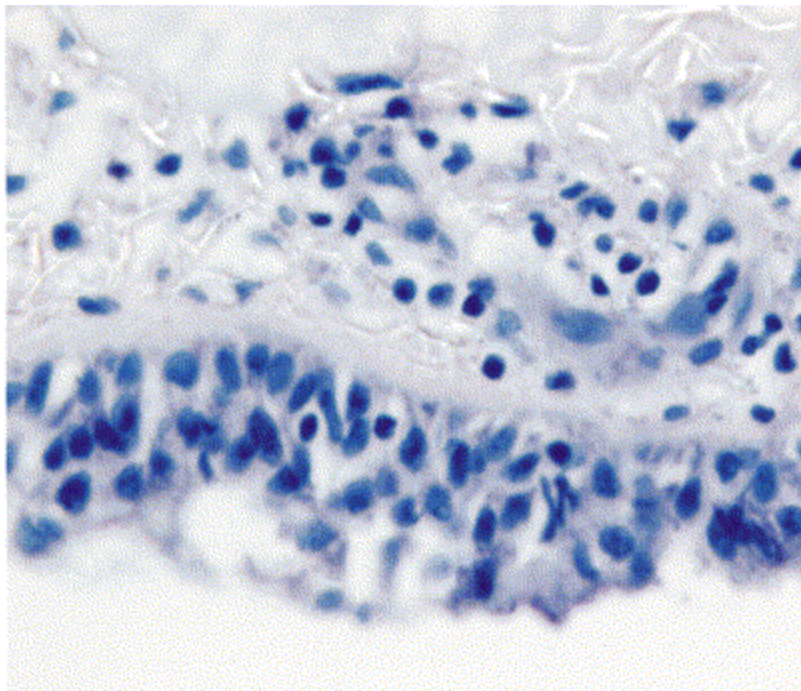
Similar RBM thickening

Eos. and Neutr. in epithelium: S > PS

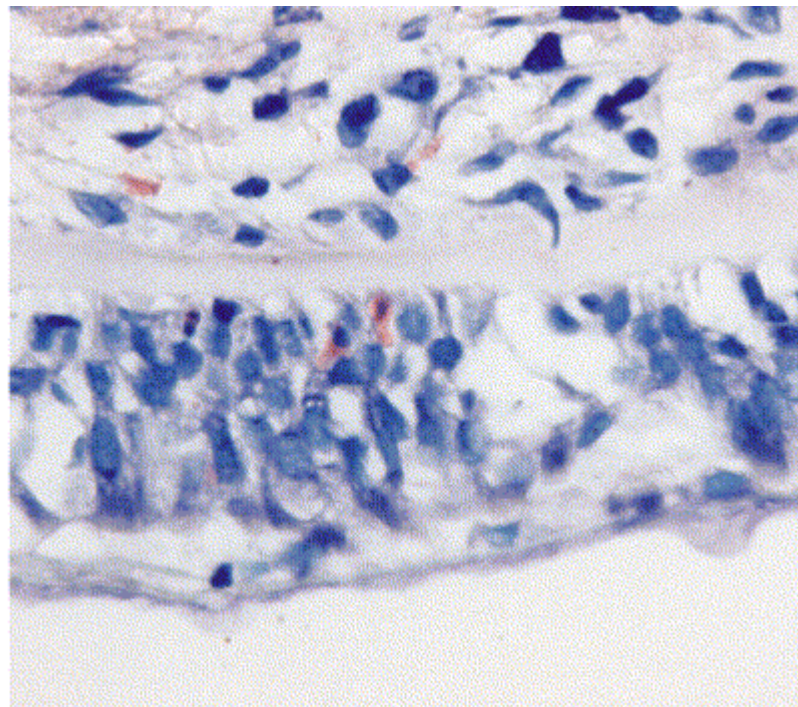
IFN γ e IFN γ / IL-4 ratio: PS > S

Symptoms are associated with Th2 dependent inflammation.

A



B



Bronchial biopsy (May-Grunwald Giemsa) from a paucisymptomatic child showing intraepithelial and submucosal mononuclear cells (A) and from a symptomatic child showing eosinophils in the intraepithelial and submucosal area (B). Magnification $\times 500$.

Difficult asthma in children: a biopsy-based study

De Blic et al JACI 113:97,2004

Are we overtreating recurrent wheezing in infancy?

- There is an excessively frequent label of asthma in intermittent exclusive virus-induced wheezing in infancy often leading to inappropriate use of steroids
- There is still under-diagnosis and poor management in children with established asthma.
- Asthma starts early in life with recurrent wheezing frequent in the first year of life.
- Phenotypes overlap in this age group, and pediatricians frequently prescribe controller asthma medication regardless of whether symptoms are troublesome or if there is a clear response to treatment.



Allergic Bronchopulmonary Aspergillosis

Diagnostic criteria

- Asthma.
- Immediate skin reactivity to *Aspergillus*.
- Serum precipitins to *A fumigatus*.
- Total serum IgE >1.000 ng/ml
- Current or previous pulmonary infiltrates.
- Central Bronchiectasis.
- Peripheral Eosinophilia.

Aspergillus sensitization is associated with airflow limitation and bronchiectasis in severe asthma

D. Menzies, L. Holmes, G. McCumesky, C. Prys-Picard & R. Niven *Allergy* 2011; 66: 679–685.

A. fumigatus sensitization was associated with a 2.01 increased hazard ratio of bronchiectasis (95% CI 1.26 to 3.22, $P = 0.005$), and more obstructive spirometry postbronchodilator FEV1/FVC ratio 57.6 vs 70.3 $P = 0.001$

even when diagnostic criteria for ABPA are not met

Contents

- Allergic Rhinitis
- Allergic Conjunctivitis
- Inflammation
- Obesity



Allergologia et immunopathologia

www.elsevier.es/ai

ORIGINAL ARTICLE

Exercise-induced bronchospasm in obese adolescents

W.A. Lopes^a, R.B. Radominski^b, N.A. Rosário Filho^c, N. Leite^{d,*}

to assess the frequency and severity of EIB in obese adolescents with or without prior clinical history of asthma

- Severity of EIB: Maximum Fall in %FEV₁
- and the area above the curve (AAC_{0-30 min})

Cross-sectional study

N= 80 , ages 10–16 ys

Asthmatic obese (n = 18)

Asthmatic non-obese (n =21)

Obese non-asthmatic (n =26)

Healthy individuals (n =15)

Exercise bronchoprovocation test : \downarrow FEV1 \geq 15%,
maximum % fall in FEV1 (MF%FEV1) and
area above the curve (AAC0-30min) were calculated
to evaluate EIB severity and recovery.



Body Mass Index (BMI) $>95^{\circ}$ (Center for Disease Control and Prevention (CDC))

Table 1 Anthropometric characteristics and pulmonary function of the groups

	Asthmatic obese (n = 18) Mean \pm SD	Asthmatic non- obese (n = 21) Mean \pm SD	Obese non- asthmatic (n = 26) Mean \pm SD	Healthy (n = 15) Mean \pm SD	p
Age (years)	12.0 \pm 1.5	13.7 \pm 1.7	12.6 \pm 1.6	13.5 \pm 2.1	NS
Stature (cm)	157.0 \pm 8.7	158.5 \pm 9.6	160.4 \pm 7.7	157.0 \pm 11.7	NS
Weight (kg)	71.6 \pm 14.2	46.5 \pm 9.6 [†]	77.3 \pm 17.3 [§]	46.8 \pm 9.9 [‡]	0.0000
BMI (kg.m ⁻²)	28.9 \pm 4.9	18.4 \pm 2.0 [†]	29.9 \pm 5.9 [§]	18.7 \pm 2.2 [‡]	0.0000
FEV ₁ (L)	2.83 \pm 0.7	2.95 \pm 0.8	2.99 \pm 0.6	2.88 \pm 0.8	NS
FEV ₁ (pred %)	95 \pm 11	96 \pm 10	94 \pm 14	94 \pm 12	NS

BMI = body mass index; FEV₁ = forced expiratory volume in one second.

[†]Asthmatic obese \times asthmatic non-obese; [‡]obese non-asthmatic \times healthy; [§] asthmatic non-obese \times obese non-asthmatic.
Kuskall–Wallis and Mann–Whitnev tests.

Table 2 Frequency of exercise-induced bronchospasm, intensity of FEV₁ reduction and area above curve in the groups studied

	Asthmatic obese (n = 18)	Asthmatic non-obese (n = 21)	Obese non-asthmatic (n = 26)	Healthy (n = 15)	p
EIB (%) 95%CI	50 (45–55)	38 (34–43)	11.5 (11–12) [§]	6.7 (3.4–10)	0.01
MF/FEV ₁ (%) Mean ± SD	37.7 ± 18.5	24.5 ± 8.3 [†]	19.5 ± 4.4	–	0.02
AAC _{0–30} (%.min) Mean ± SD	455 ± 469	214 ± 275 [†]	62 ± 239 [§]	54 ± 191	0.03

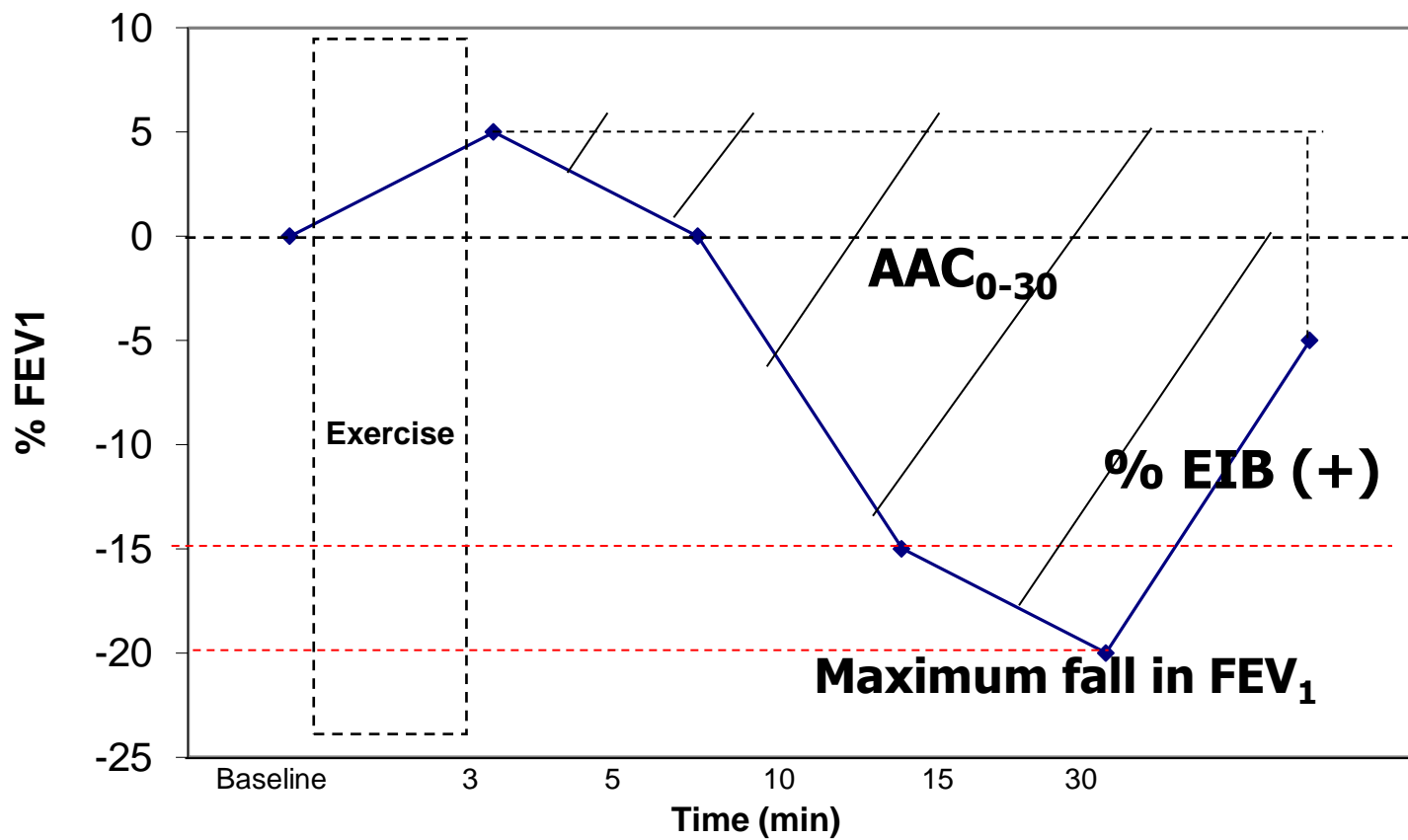
EIB = exercise-induced bronchospasm; MF/FEV₁ = % maximum fall in FE V₁; AAC_{0–30} = area above curve.

[†]Asthmatic obese × asthmatic non-obese; [‡]obese non-asthmatic × healthy; [§] asthmatic non-obese × obese non-asthmatic.

Fisher Exact test. Kuskall–Wallis and Mann–Whitney tests.

Excess weight increased EIB frequency among asthmatic and non-asthmatic adolescents and contributed to severity in EIB.

Parameters for EIB evaluation



- Obesity impacted negatively pulmonary function in both asthmatics and non asthmatics after exercise
- Excess weight in asthmatics significantly contributed to increase in exercise-induced bronchospasm severity and recovery period
- EIB should be evaluated in obese before initiating a fitness program.



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Muchas Gracias



Prof.Dr. Nelson Rosário



HOSPITAL DE CLÍNICAS
UNIVERSIDADE FEDERAL DO PARANÁ

