Natural history of wheezing in a cohort of children in La Habana, Cuba. "HINASIC"

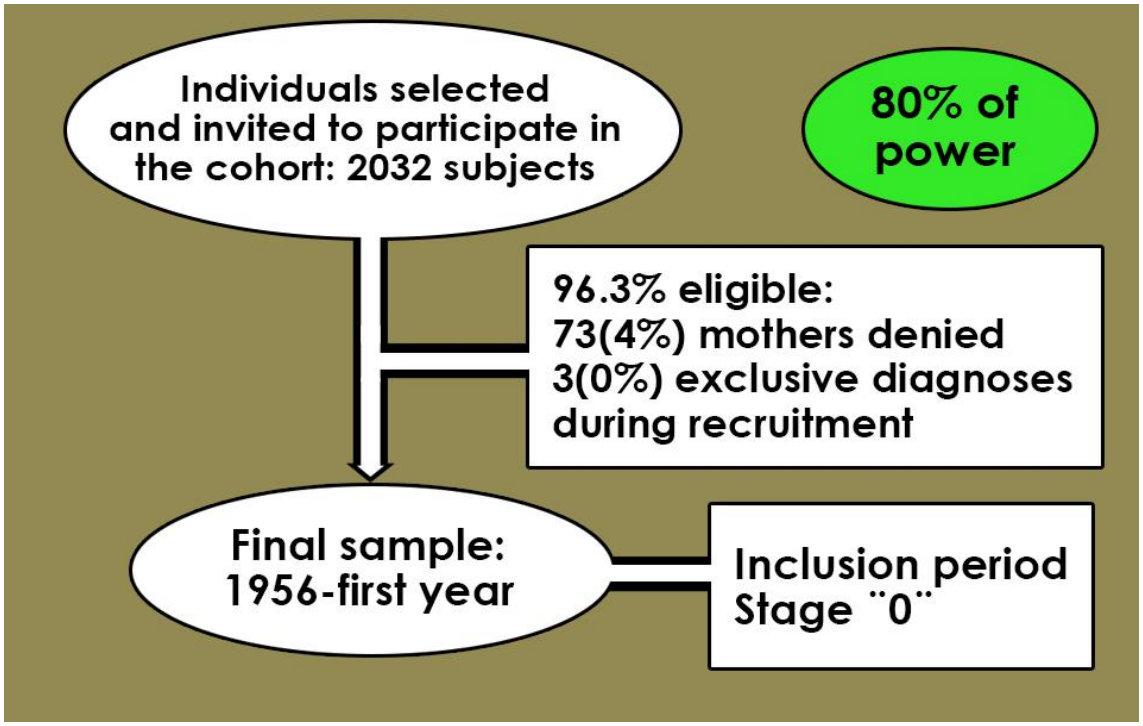
Informational Report # 7 - wheezing / immunological markers

The National Institute of Hygiene Epidemiology and Microbiology of Cuba, in collaboration with the University of Nottingham, UK, has lead the study of a cohort of children from birth in order to identify the incidence, characteristics and risk or protective factors associated to wheezing in preschool.

The first results are presented in this report.

POPULATION PARTICIPATING 2010-2011

Recruitment diagram



During the period 2010-2011 was requested the agreement of parents or guardians of selected children representative of Havana, Cuba, to participate in

the HINASIC study. ISAAC questionnaire was applied, with the addition of questions by interest of the researchers and were carry out laboratory tests (stool, total IgE, eosinophil full count and complete blood count with differential).

Laboratory tests were performed after the child was recruited and free from symptoms of some disease for at least a month.

RESULTS (2010-2011)

Infants with laboratory tests according to total IgE. HINASIC, 2010-2011

IgE Total (n=877)		No.	% (CI 95%)
Normal		557	63.5 (59.2-67.8)
High (≥ 60 IU/L)		320	36.5 (32.2-40.9)
by categories	60.01 a 99.99	105	32.8 (27.0-38.7)
	100 a 199.99	118	36.9 (31.7-42.0)
	200	97	30.3 (26.5-34.2)

$X^2 = 709.62$, df = 3, p <0.0001

36.5% of infants had elevated total IgE. 67.2% of them have values of 100 IU/L or more. Multiple factors may cause the increase of the total IgE (passive smoking, prolonged use of steroids, antibiotics, obesity, etc.) some of them present in the sample, however, values of 200 IU/L or more are considered predictive indicator of atopic disease.

Infants with laboratory tests according to neutrophils. HINASIC, 2010-2011.

Neutrophils (n= 884)	No.	%	(IC 95%)
Neutrophilia	129	14.6	9.1- 20.1
Normal	745	84.3	78.8 - 89.8
Neutropenia	10	1.1	0.0 - 2.3

X^2 = 314.27, df = 2, p <0.0001

In eight out of 10 infants neutrophil counts are within the normal range, however in 14.6% was detected increased values (neutrophilia).

Neutrophilia was found in 16% of infants with recurrent wheezing, constituting a major cellular inflammatory marker to this clinical picture.

Infants with laboratory tests as total count of eosinophils. HINASIC, 2010-2011.

Total eosinophil count (n = 845)	No.	% (CI 95%)
Normal	772	91.4 (88.2-94.5)
High	73	8.6 (5.5-11.8)
Light eosinophilia (0.45-0.99 x 10^9)	56	76.7 (66.0-87.5)
Moderate eosinophilia (1.0-2.9 x 10^9)	11	15.1 (9.5-20.6)
Severe eosinophilia (3 ó more x 10^9)	6	8.2 (0.0-17.3)

X^2 = 2038.0 df = 3, p <0.0001

8.6% of the subjects had eosinophilia, of which 76.7% had ligth eosinophilia, 15.1% moderate and 8.2% severe.

Within recurrent wheezing 4.7% had eosinophilia and elevated total IgE, these subjects have a high probability of atopy as a cause of recurrent wheezing, whereas in non-recurrent wheezing 3.9% had eosinophilia and high total IgE, which could render to other causes: transient wheezing, non-atopic asthma, bronchiolitis and pneumonia / bronchopneumonia.

Infants with laboratory tests according to total count of eosinophils, total IgE and Wheezing. HINASIC, 2010-2011. (N = 778)

Total count of Eosinophils	Total IgE											
	Recurrent wheezing				Total		Non-recurrent wheezing				Total	
	Pathologic		Normal				Pathologic		Normal			
	No.	%	No.	%	No.	%	No.	%	No.	%	No	%
Pathologic	8	4.7	9	5.3	17	9.9	24	3.9	178	29.3	202	33.3
Normal	57	33.3	97	56.7	154	90.1	26	4.3	379	62.4	405	66.7
Total	65	38.0	154	90.0	171	100	50	8.2	557	91.8	607	100

X^2 = 0.6303, gl = 1, p = 0.427 X^2 = 4.934, gl = 1, p = 0.0263

CONCLUSIONS

The prevalence of cellular inflammatory markers and elevated IgE in infants of Havana reflects an important immunoepidemiologic element that suggests a high probability of immuno-allergic population or severe respiratory illness in the future. Interventions from early life may be taken with individuals who express similar values of these immunological markers.

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