

Asthma in Children : View point from Indonesia

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Abstrak

Telah diutarakan secara singkat data-data klinis, laboratoris dan uji kulit anak dengan asma yang diperoleh dari hasil beberapa penelitian yang telah dilakukan di beberapa tempat di Indonesia. Data tersebut menunjukkan bahwa pada anak prevalensi penyakit atopi berkisar antara 3,8% sampai 25,5% dan penyakit asma antara 3,7% dan 16,4%. Tampaknya prevalensi penyakit alergi di daerah pedesaan lebih rendah dibanding daerah urban dan yang tertinggi adalah di daerah perkotaan. Penyakit alergi yang terbanyak terdapat adalah penyakit alergi jalan napas. Perbandingan asma pada anak laki-laki lebih tinggi dibanding anak perempuan, dan sebagian besar umur permulaan timbulnya asma adalah kurang dari 5 tahun. Sebagian besar asma pada anak menunjukkan riwayat atopi pada keluarga dan juga sering disertai adanya manifestasi alergi lainnya. Jumlah hitung eosinofil darah pada anak dengan asma umumnya meningkat, tetapi kenaikan jumlah eosinofil hipodens sampai lebih dari 20% lebih sering ditemukan. Kadar IgE serum juga umumnya meningkat. Sebagian besar anak dengan asma menunjukkan tes kulit yang positif dan 3 alergen terbanyak penyebab tes kulit positif adalah debu rumah, epitel binatang dan tungau debu rumah. Tes kulit positif terhadap tungau debu rumah biasanya juga menunjukkan tes RAST yang positif dan tes kulit yang negatif menunjukkan tes RAST yang negatif dengan korelasi sebesar 77%. Tanpa memperhitungkan adanya pemberian formula atau makanan padat dan makanan tambahan lainnya, tidak terlihat adanya korelasi yang bermakna antara lamanya pemberian air susu ibu dan umur permulaan timbulnya asma pada anak.

Abstract

A brief review on clinical, laboratory and skin test data of children with asthma obtained from several studies done in certain places of Indonesia has been presented. The data revealed that the prevalence of atopy ranged from 3,8 % to 25.5 % and the prevalence of asthma ranged from 3.7 % to 16.4 %. It seemed that the prevalence of allergic diseases is in the city. Respiratory allergy is the most common allergic disease in children. The proportion of asthma in males is greater than in females and the age of onset were mostly under 5 years old. Asthma in children mostly showed positive family history of atopy and is frequently associated with other allergic diseases. Eosinophil count is usually increased in asthmatic children, but increased eosinophil hypodense to a percentage more than 20 % was more frequent. Serum IgE level is frequently increased in children with asthma. The majority of children with asthma showed positive skin test and the three leading positive prick test were against house dust, animal epithelia and house dust mite. Positive prick test against house dust mite was correlated with positive RAST and negative prick test with negative RAST overall to a level of 77 %. Without considering the presence of formula or solidfood, there was no significant correlation between duration of breast feeding and age of onset of asthma.

Keywords : Asthma, Prevalence, Atopy, Serum IgE, Eosinophil count, Prick test, Breast feeding

INTRODUCTION

Asthma is one of the diseases which is usually seen in our private practice. It is one of the leading causes of school absences in children. The prevalence of asthma seems to be increased in this last decade and the factors responsible for this increase are probably changing of

life style, industrialisation and the increasing numbers of new chemicals.

Although childhood and adult asthma share the same pathophysiologic mechanisms, there are some features that are distinctive in infants and children. It is said that the majority of asthma in children were of allergic origin, had family history of allergic dis-

eases,^{1,2} age of onset under five years^{3,4} and showed positive skin test with the three leading percentage against house dust, animal epithelia and house dust mite. Asthma in children also showed increased level of serum IgE and increased peripheral eosinophil count.^{5,6}

It is also suggested that breast feeding can prevent, postpone or modify the onset of atopic diseases in infants and children.^{7,8} In this connection the author tried to illustrate the clinical, laboratory and skin test data of children with asthma obtained from several studies done in certain places of Indonesia.

Prevalence of asthma in children

From our previous community study in certain urban areas around central Jakarta, it revealed that the prevalence of atopy in children under 14 years old was 25.5 % and 6.9 % among them was asthma.⁹ While Konthen,¹⁰ in his community study in school children 6 to 20 years old in a certain rural area in Bali found that the prevalence of atopy was 13.8 % and 3.7 % among them was asthma. Djayanto,¹¹ in his study in school children 5.6 to 13.4 years old in South Jakarta (city area) found that the prevalence of asthma was 16.4 % (table 1). It seemed that the prevalence of asthma is lower in the rural area than in the urban area and the highest is in the city. Whether this difference was due to the different environment (pollution and life style), further investigation should be done. This different findings support the opinion that environment beside genetic play a role in the manifestation of allergy.

Table 1. Prevalence of asthma in children in Jakarta and Banyuatis Village Bali

Author	Place of study (age)	Prevalence of asthma N	%
Konthen ¹⁰	Banyuatis Bali rural area (6 - 20 years)	22/590	3.7
Siregar et al ⁹	East Jakarta (under 14 years)	17/243	6.9
Djayanto ¹¹	South Jakarta city area (5,6 - 13,4 years)	192/1171	16.4

From a retrospective study¹² conducted in the outpatient clinic, Subdivision of Allergy and Immunology, Department of Child Health, Dr Cipto Mangunkusumo Hospital, Jakarta it revealed that most of the outpatient visitors were asthmatic children, the next most were urticaria followed by allergic rhinitis and atopic dermatitis (figure 1). But from the community study⁹ it revealed that allergic rhinitis is the most common allergic manifestation in children (9.0%). So did Konthen,¹⁰ he found that the prevalence of allergic rhinitis was 6.6 %. The different figure obtained in the outpatients clinic may be due to that some patients with allergic rhinitis visit the outpatient clinic of the Ear, Nose and Throat department. But as a whole it revealed that respiratory allergy is the most common allergic disease in children.

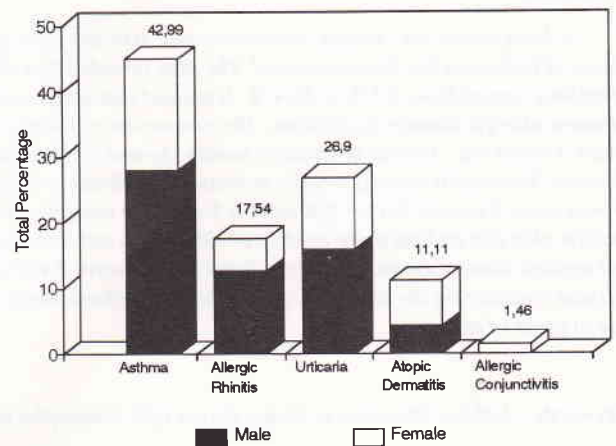


Figure 1. Total percentage of allergic disease in the outpatient clinic Sub Division of Allergy/Immunology Cipto Mangunkusumo Hospital, 1984.¹²

Sex and age of onset

Table 2 showed that the proportion of children with asthma in males was greater than infemales.

Table 2. Sex ratio of children with asthma

Author	Place of study (age)	Sex ratio
Damanik et al	Pangeran Hospital Yogyakarta (under 14 years)	1.55 : 1
Konthen ¹⁰	Banyuwatis Bali (6 - 20 years)	1 : 1
Matondang ¹²	Cipto Mangunkusumo Hospital, Jakarta (8 months - 14 years)	1.36 : 1
Siregar et al ⁹	Urban area East Jakarta (under 14 years)	1.42 : 1
Djayanto ¹¹	South Jakarta (5,6 - 13,4 years)	1.4 : 1

This is in agreement with the findings of other investigators.^{13,14} The cause of this sex variation is still unknown, although humoral factors have been implicated.

Table 3. Age of onset of asthma in children

Author	Place of study	Age of onset under 5 years
Matondang ¹²	Cipto Mangunkusumo Hospital outpatient clinic sub division of allergy/immunology	70.2 %
Djayanto ¹¹	School children South Jakarta	46.4 %

Table 3 showed that most of the children with asthma had the age of onset under 5 years. This is also in agreement with the findings of other investigators.^{3,4} This may be due to the viral respiratory infections which may precipitate asthma in certain individual.

Family history of atopy

Table 4 showed that most of the children with asthma visiting the outpatient clinic of Subdivision of Allergy/Immunology showed a positive family history of atopy (including asthma, allergic rhinitis, urticaria and

atopic dermatitis). This is also in agreement with the findings of other investigators.^{1,2} The high percentage of family history of atopy in asthma supports the opinion that asthma is inherited.

Table 4. Family history of atopy in asthmatic children

Family history of atopy*	N	%
Presence	99	95.2
Absence	5	4.8
Total	104	100.0

* Patient's siblings, parents and their siblings, grand father and grand mother and their siblings.¹⁶

Presence other allergic diseases

Table 5 showed that other allergic manifestations are frequently associated with childhood asthma. This finding is also seen by other investigators.^{1,2} It is not known whether the presence of other allergic manifestation in asthma is an indication that the asthma tends to become chronic. But according to Kuzemko,¹⁵ asthma with persistent dermatitis tends to become chronic.

Table 5. Other allergic manifestations in asthmatic children¹⁶

Other allergic manifestations	N	%
Urticaria	18	17.3
Allergic rhinitis	14	13.4
Atopic dermatitis	7	6.7
No other allergic diseases	65	62.5
Total	104	100.0

Serum IgE level

Henderson et al,⁵ noted that 75 % patients with extrinsic asthma showed increased serum IgE levels. Our study¹⁶ showed that 52 out of 97 children (53.6 %) with asthma without considering the presence of ascariasis or other allergic manifestations showed increased serum IgE levels (table 6). But this figure is lower compared with the percentage of positive skin test we had. Several investigators^{17,18} noted that the presence

of specific IgE was not necessary increased the total serum IgE. They found that high house dust IgE specific can be detected in normal total serum IgE level. Our study¹⁶ showed that 64 out of 69 (92.8 %) children with asthma showed positive skin test against house dust. So the lower percentage of increased serum IgE levels we had, may be due to what other investigators had noted. It seemed that normal IgE serum level did not rule out the presence of allergic asthma. Other factor that may influence the lower percentage was the different technique we used.

Table 6. Serum IgE level and eosinophil count in asthmatic children

	N	%
Increased serum IgE level ¹⁶	52/97	53.6
Increased eosinophil count ¹⁶	36/91	39.5
Eosinophil hypodense greater than 20 % ²⁰	17/18	94.4

Eosinophil count

McNicol and Williams⁶ found that peripheral blood eosinophil count was higher in asthma compared with control group. Our study¹⁶ showed that 36 out of 91 (39.5 %) children with asthma without considering the presence of ascariasis or other allergic manifestations showed increase eosinophil count (table 6). It is said that counting the percentage of eosinophil hypodense is more significant than the total eosinophil.¹⁹ Iswari²⁰ found that 17 out of 18 (94.4 %) children with asthma visiting the outpatient clinic of subdivision of Pulmonology, Department of Child Health Dr. Cipto Mangunkusumo Hospital, Jakarta, showed a positive eosinophil hypodense greater than 20 %.

Allergy skin testing

Table 7 showed that the majority of children with asthma showed positive skin prick tests. Such finding were also noted by other investigators.^{21,22} This finding supports the opinion that most of asthma children were allergic.

Table 7. Result of prick test in asthmatic children¹⁶

Prick test	N	%
Positive	64	92.8
Negative	4	7.2
Total	69	100.0

The three leading percentage of positive prick test were against house dust, animal ephitelia and house dust mite (figure 2). The same findings were also noted by other investigators.^{22,23} We also noted that positive skin test against house dust mite correlated with positive RAST and negative skin test with negative RAST overall to a level of 77 %.²⁴ This good correlation between positive skin test against house dust mite and mite RAST was also seen by other investigators,^{17,18,23} Hsieh²³ found that 90 % of sera from individuals with skin test positive to mite also gave positive RAST.

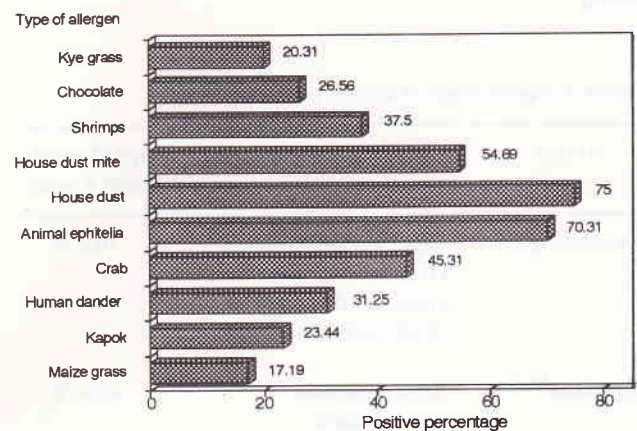


Figure 2. Positive prick tests against various type of allergen¹⁶

Breast feeding and age of onset of asthma

Saarinen et al,⁸ found that exclusive breast feeding up to 6 months and even up to 4 weeks⁷ can prevent or postpone the onset of asthma in a child whose mother is an atopic individual. However in our study¹⁶ in 104 children with asthma, showed that there was no significant correlation between duration of breast feeding and age of onset of asthma. This different finding may

be due to that in this study the presence of formula or solid food besides breast feeding were not considered.

SUMMARY

The prevalence of atopy in children ranged from 13.8% to 25.5% and the prevalence of asthma ranged from 3.7% to 16.4%. It seemed that the prevalence of allergic diseases is lower in the rural area than in the urban area and the highest is in the city.

Respiratory allergy is the most common allergic disease in children.

The proportion of asthma in males is greater than in females and the majority of the children had an age of onset under 5 years old. Asthma children mostly showed family history of atopy and are frequently associated with other allergic manifestations. The presence of specific serum IgE to house dust was not necessary increased the total serum IgE. Counting the percentage of eosinophil hypodense is more significant than the total eosinophil.

The majority of asthma in children showed positive prick test and the three leading percentage were against house dust, animal epithelia and house dust mite. Positive skin test against house dust mite correlated with positive RAST and negative skin test with negative RAST.

There was no significant correlation between duration of breast feeding and age of onset of asthma without considering the presence of formula or solid food besides breast feeding.

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