

## Parents' perceptions of food intolerance among under-five children in Gianyar Bali

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### ABSTRACT

**Objective** To estimate the proportion of food intolerance in children based on parents' perception and to analyze factors associated with food elimination.

**Methods** A cross-sectional study was done among 250 mothers of under-five children in Gianyar District, Bali. Mothers were interviewed with a questionnaire concerning basic characteristics of the children, the family, a list of allergic diseases, disturbance after ingesting certain foods, food avoidance, the reason for eliminating certain foods, the person who gave advice, and probable parental history of allergic diseases.

**Results** Fifty-three children (21.2%) were suspected to have 'probable allergic diseases' and six (2.4%) had 'probable food intolerance'. Food elimination was practiced in 27 (10.8%) families. 'Probable allergic parents' was found in 49 (19.6%) families. There was a significant difference in child allergy in proportion to parental allergy ( $\chi^2$  test  $p < 0.0001$ ). Food elimination was not associated with parental allergies, children's allergies or children's ages ( $\chi^2$  test  $p = 0.36, 0.47, \text{ and } 0.56$ ), but seemed to be related to low educational status of mothers ( $\chi^2$  test  $p < 0.0001$ ) and fathers (Fisher's exact tests  $p < 0.0001$ ).

**Conclusions** The proportion of children with 'probable allergic diseases' was higher in families with 'probable allergic parents'. The proportion of food elimination was greater than the prevalence of 'probable food intolerance'. Low educational status of parents played an important role in this discrepancy of food elimination in children [Paediatr Indones 2003;43:226-229].

**Keywords:** parents' perceptions, food intolerance, food elimination

Some children develop an adverse reaction to certain foods with a wide variety of symptoms. The terms used to describe these symptoms were food sensitivity, food intolerance, food allergy, food aversions, and so on. Unfortunately parents and health professionals use the terms food sensitivity and food allergy interchangeably.<sup>1</sup> The

actual diagnosis is determined using double blind placebo controlled food challenge and other procedures such as intradermal skin test, radioallergosorbent test, basophil histamine release, intestinal mast cell histamine release, and intragastric provocation under endoscopy.<sup>2</sup> These procedures are usually performed in a clinical research, and this diagnostic difficulties might limit the prevalence of this problem in a community study. Some studies showed the benefit of parents' perceptions of food intolerance to assess the prevalence of this problem in the community and thus can help the planning of health education for the community and health professionals.<sup>3,4</sup>

Balinese are mainly Hindus with special culture and food habits and may show a different perception concerning food intolerance among children. The aim of this study was to determine the prevalence of food intolerance among under-five children in Gianyar Bali based on parents' perception.

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## Methods

We performed a cross sectional study in Gianyar Sub District, Gianyar District, Bali from August to November 2001. Subjects were mothers and their under-five year-old children who agreed to be involved in this study. Trained interviewers collected data with a questionnaire. We purposely chose working mothers and housewives as subjects with almost equivalent proportions. Minimal sample size was 239 mothers based on the anticipated population proportion of food intolerance (0.10) and a precision of 0.05.<sup>6</sup>

The questionnaire consisted of basic characteristics of the subject and the family, a list of symptoms of allergic illnesses such as asthmatic attacks, wheezing, urticaria, etc., a list of questions concerning disturbance after ingesting certain foods, food avoidance, reasons for practicing food eliminations, person who gave advice for food elimination, and parental illnesses related to food intolerance such as asthma, urticaria, runny nose.

A child was defined as having 'probable food intolerance' when the mother reported a disturbance after ingesting certain food. Probable allergic diseases were defined as all of probable allergic diseases except 'probable food intolerance', therefore, according to parents, 'probable allergic diseases' did not relate to ingesting certain food.

Data were analyzed with  $\chi^2$ -test or Fisher's exact test using SPSS 10.0 for Windows, and the p value of less than 0.05 was defined as a significant difference.

## Results

### Basic characteristics of the subjects

The mothers were mostly housewives (66.0%), highly educated (64.4%); their husbands were private employees (32.0%) and also highly educated (83.2%). Most of the families had one or two children (41.6%

**TABLE 1. BASIC CHARACTERISTICS OF THE SUBJECTS**

Characteristics	n	%
Child's age		
0 – 11 months	58	23.2
12 – 35 months	143	57.2
36 – 60 months	49	19.6
Father's occupation		
Private employee	80	32.0
Labor	79	31.6
Civil servant	51	20.4
Merchant	27	10.8
Others	13	5.2
Mother's occupation		
Housewife	165	66.0
Civil servant	81	32.4
Others	3	1.6
Education level of father		
Primary school	16	6.4
Junior high school	26	10.4
Senior high school	158	63.2
University	50	20.0
Education of mother		
Primary school	33	13.2
Junior high school	56	22.4
Senior high school	121	48.4
University	40	16.0
Number of children in the family		
1	104	41.6
2	104	41.6
3	34	13.6
4	6	2.4
5	1	0.4
6	1	0.4

and 41.6% respectively). There were 143 (57.2%) children aged 12 – 35 months (Table 1).

### Probable allergic diseases

Fifty-five (21.2%) children suffered from 'probable allergic diseases', mostly runny nose (46 children). Other symptoms were morning cough (11 children), night cough (9 children), diarrhea (8 children), asthma (6 children), wheezing (5 children), vomiting (5 children), urticaria (4 children), day cough (2 children), and eczema (2 children).

### Probable food intolerance

Only 6 children were diagnosed with 'probable food intolerance'. Candy, ice, and 'Chiki' snacks were most frequently reported as the cause followed by jackfruit (one child) and tea (one child).

### Food elimination

Although we only found six (2.4%) children suffering from 'probable food intolerance', there were 27 (10.8%) parents who practiced food elimination which shows a large discrepancy between these two

conditions. Egg was avoided by 20 children, crab by seven, and shrimp by six. Next was peanut (3 children), 'Chiki' snack and lamb (2 children), green bean, potatoes, wheat, chicken, "taro" snack, cheese, chocolate, and milk (one child each).

Of the 27 parents, only one gave unrelated reason for food elimination (dental caries), the others (23 parents) as allergic prevention. Two parents related food elimination to prevent cough and one to itching. Only three cases were recommended by doctors or paramedics, compared to 24 who decided for themselves.

### Probable allergic parents

Forty nine (19.6%) parents suffered from 'probable allergic diseases', 36 (14.4%) had rhinitis allergica, 15 (6.0%) urticaria, and 5 (2.0%) asthma and it was possible that they had more than one illness. Most allergic children came from families with parental allergic diseases (Table 2).

### Relationships between food eliminations and related factors

The practice of food eliminations may be influenced by factors such as parental allergies, child allergies,

**TABLE 2.** THE PROPORTION OF ALLERGIC CHILDREN AND ALLERGIC PARENTS

	Allergic parents (+)	Allergic parents (-)	p
Allergic children (+)	25	28	<0.0001*
Allergic children (-)	24	173	

\*  $\chi^2$  test significantly difference

**TABLE 3.** FOOD ELIMINATIONS AND RELATED FACTORS

Factors	Food elimination (+)	Food elimination (-)	p value
Parental allergic illnesses			
Yes	4 (8%)	45 (92%)	0.36@
No	23 (11.4%)	178 (88.6%)	
Children allergic illnesses			
Yes	5 (9%)	48 (91%)	0.47@
No	22 (11.2%)	175 (88.8%)	
Children age			
<1 year	6 (10%)	52 (90%)	0.56@
≥1 year	21 (10.9%)	171 (89.1%)	
Education status of mother			
High	9 (6%)	152 (94%)	<0.0001*@
Low	18 (20.2%)	71 (79.8%)	
Education status of father			
High	15 (7%)	193 (93%)	<0.0001*#
Low	12 (29%)	30 (71%)	

\* significantly different

@ $\chi^2$  test, #Fisher exact test

children's ages, and the education level of parents. **Table 3** shows that low education of mothers and fathers significantly correlated with food eliminations.

## Discussion

This study showed that from observation through parents' perceptions, the prevalence of food intolerance was 2.4%. This was similar with reports of the prevalence of food allergy in children as 1.4% (0.5% to 3.8%) in the general population,<sup>6</sup> 3.8% in the Netherlands,<sup>4</sup> and 3% in England and Scotland.<sup>3</sup> In this study, 'probable allergic illnesses' were found among 21.2% children. The causative agents reported were different from other countries due to different feeding habits and the amount of food consumed. The greater frequency of intolerance to soy in Japan, to peanuts in the United States, and to fish in Scandinavia may be associated with the relative amounts of these foods consumed in respective countries.<sup>7</sup> In this study, egg was the predominant causative agent reported by parents. Sampson *et al* (1985) reported that egg accounted for 42% of the hypersensitivity-induced reactions in 63 children with atopic dermatitis who experienced positive double-blind placebo-controlled oral food challenges.<sup>8</sup> Moreover, a study done in Sardjito Hospital by Elberink *et al* (1995) showed that of nine patients with 2-week positive challenge tests, egg allergy was found among six (77%) patients.<sup>9</sup>

Parents usually worry about the negative impact of food intolerance to their children's health and practice food eliminations to prevent it. This study showed a discrepancy between food eliminations and 'probable food intolerance'. We found 10.8% parents imposed food eliminations compared to 2.4% parents who reported actual 'probable food intolerance'. The possible explanation was to prevent 'probable allergic diseases'. These were reported by 21.2% parents. From 53 children who suffered from 'probable allergic illnesses', 9% came from families who practice food elimination compared to 11% who did not practice food elimination but this difference was not statistically significant. Apparently, the decision was not based on the child's situation. In this study, low educated parents practiced more food elimination compared to those who were highly educated. Health personnel should be aware of this problem. In this study only 1.6% of parents practiced food elimina-

tion based on doctor/paramedic advice. Rona & Chinn (1987) reported that 67% of their cases were consulted to doctors. Furthermore they reported that the pattern of avoided food was very similar in children who received advice from health personnel and the children who were not advised.<sup>3</sup> Inappropriate food elimination could result in a serious problem for malnourished children since the food eliminated from their diet are usually animal proteins, especially eggs.

As a conclusion we reported that the proportion of children with 'probable allergic illnesses' was higher in families with 'probable allergic parents', the proportion of food elimination was greater than the prevalence of 'probable food intolerance' and low education of parents was related to this discrepancy of food elimination in children.

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