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Profile of Children with Food Allergies at Dr. Soetomo Surabaya

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Introduction: *The rising prevalence of food allergies in both developed and developing countries has emerged as a significant public health concern. Food allergies can result from various foods, with common triggers in children including cow's milk, eggs, soy, wheat, fish, seafood, peanuts, tree nuts, and other dietary staples. These allergies can lead to diverse clinical manifestations affecting multiple organs and systems, posing severe health challenges, particularly for children.* ***Objective:*** *This study aims to outline the characteristics of pediatric patients with food allergies treated at Dr. Soetomo Hospital, Surabaya.* ***Methods:*** *A descriptive observational approach using a cross-sectional method was employed, analyzing data from patient medical records. The sample consisted of total cases meeting inclusion criteria.* ***Results and Discussion:*** *Among the patients, 61.1% were female, with an average age of 6.07 ± 3.44 years. Common allergenic foods included bananas (70.4%), tilapia fish (68.5%), and mackarel tuna (59.3%). Notably, 57.4% of children exhibited sensitivity to two or more allergen groups. The predominant clinical symptoms were rhinitis (92.6%) and chronic recurrent cough (70.4%).* ***Conclusion:*** *Pediatric food allergy patients are predominantly female, around six years old on average, with bananas, tilapia, and mackarel tuna identified as frequent allergens. Respiratory symptoms, particularly rhinitis and chronic cough, were the most common clinical presentations*

Keywords: Profile; Children; Food Allergies;

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Introduction

The term allergy was first coined in 1906 by the Austrian pediatrician Clemens von Pirquet, who described serum abnormalities in children treated with antibody preparations. Food allergy is defined as a reaction to certain foods, which is usually harmless to the general population, resulting from immunological mechanisms and often occurring in susceptible individuals, which is detrimental. Food allergies are different from adverse reactions caused by toxins or pathogens contained in food, and also different from food intolerance, which exhibits the same symptoms but is based on different pathogenic mechanisms. Food intolerance is defined as a non-immune reaction, mediated by toxic, pharmacological, metabolic or undefined mechanisms. Due to their demonstrated clinical similarities, food allergies and food intolerances are often confused with each other. In addition, the same food is often responsible for both conditions, which makes diagnosis difficult (De Martinis et al., 2020).

In the last few decades, it has been observed that increasing cases of food allergies have emerged. In developed and developing countries, the increase in food allergy cases is becoming a concern as a health problem (Hossny et al., 2019). Food allergies are reported to affect around 6-8% of children under 3 years of age (Iweala et al., 2018). In Indonesia itself, it is estimated that around 5-11% of children develop food allergies (Candra et al., 2011). The shift towards an urban lifestyle, whether due to economic growth or migration, is associated with increasing rates of food allergies (Loh & Tang, 2018).

Food allergies are caused by a specific food that can trigger an allergic reaction which is called a food allergen. Food allergens that cause allergies that are commonly found in children include cow's milk, eggs, soybeans, wheat, fish, seafood, peanuts and tree nuts, while in adults, the food allergens that are often observed are fish, seafood, peanuts and tree nuts (Al-Tamemi et al., 2019). Different geographic locations and diets have a significant influence on the allergens common in a region.

Clinical manifestations due to food allergies have a wide range of complaints. Clinical manifestations of food allergies can affect various organs and systems, including the skin, digestive system, respiratory system, cardiovascular system, and nerves (De Martinis et al., 2020). Children with food allergies may experience problems such as food aversions, food rejection, food neophobia, and anxiety about eating in general (Mehta et al., 2013).

One therapy for food allergies is diet management. Dietary management is the most important and relevant long-term management strategy for food allergies (De Silva et al., 2014). Education about disease, history of food allergies, treatment and prevention of accidental exposure to allergens must also be given to parents or patients (Munasir & Muktiarti, 2013). With the increasing number of cases of children experiencing food allergies at this time, researchers want to know the profile of children experiencing food allergies at Dr. Soetomo Hospital, as a tertiary health service which is a reference for the East Java region.

Method

This research is a descriptive observational research method cross-sectional which uses secondary data sources in the form of medical records of pediatric patients who experience food allergies without other atopic diseases at the Allergy Polytechnic Department of Pediatrics, Dr. Soetomo Hospital for the 2018-2019 period. The sampling technique uses the method total sampling. The variables observed in this study were gender, age at treatment, type of allergen, and type of allergic manifestation. Medical record data is collected and grouped based on the variables studied, then analyzed descriptively and presented in the form of a frequency distribution table. This research has been reviewed and approved by the Health Research Ethics Committee of Dr. Soetomo Hospital Surabaya.

Research and Discussions

1. Gender

Table 1
Gender Distribution

Gender	n	%
Man	21	38,9%
Woman	33	61,1%
Total	**54**	**100%**

Based on Table 1, the gender of the child observed was female. The results of this study are in line with research by (Acker et al., 2017). in 2017 which showed that there were more female food allergy patients than male. In general, the pro-inflammatory character of female sexual hormones may not only increase the susceptibility to atopy, but also promote delayed type IV allergic diseases. Endogenous estrogens have also been found to increase mast cell reactivity and may reduce the amount of allergen required to induce allergic symptoms. Meanwhile progesterone works against mast cell degranulation (Afify & Pali-Schöll, 2017).

This research is different from the results of research by (Sicherer & Sampson, 2018) in 2018 which showed male gender as a risk factor for food allergies. Sex-specific genetic effects on sensitization and allergic diseases have been reported in some literature, but no consistent picture or explanation of the underlying biological processes has emerged (Melén et al., 2020).

2. Age

Table 2
Average Age

n	Mean ± SD	Median	Minimum	Maximum
54	6,07 ± 3,44	6	1	17

Based on Table 2, it is found that the average age of children with food allergies who seek treatment is 6.07 ± 3.44 years. Food allergies are more common in younger individuals. More permeable gastrointestinal mucosa, lower gastrointestinal immune function, insufficient gastric acid secretion and lower levels of digestive enzymes are possible contributors to the occurrence of food allergies (Liu et al., 2020).

3. Allergen Type

Table 3
Distribution of Allergen Types

Types of Food Allergens	n	%
Orange	28	51,9%
Banana	38	70,4%
Chocolate	4	7,4%
Cow's milk	17	31,5%
Egg	6	11,1%
Cob	32	59,3%
Tilapia	37	68,5%
Peanuts	5	9,3%

Based on Table 3, it was found that the most common type of allergen was banana, followed by tilapia and tuna. The results of this study are relatively in line with research by Cherian et al. in 2022 which shows bananas as the type of allergen most often found in children with food allergies. Cross-reactivity between fruits and pollen may be the reason for the higher prevalence of food allergies to fruits in this study (Cherian et al., 2022). Meanwhile, the high number of seafood allergy cases in Asia is claimed to be due to the high availability and high level of consumption of seafood in the Asian region (Le et al., 2019). Types of food allergens can vary across regions depending on age, socio-cultural characteristics, ethnic background, diet, food availability in the region, globalization and increasing social movements can bring people in contact with foods from other countries or cultures (Lee, 2017).

Table 4
Distribution of Allergen Counts

Number of Food Allergens in Children	n	%
1	4	7,4%
2	31	57,4%
3	17	31,5%
4	2	3,7%
Total	**54**	**100%**

Based on Table 4, it is found that children with food allergies mostly have 2 different types of allergen groups. The results of this study are in line with research by (Thörnqvist et al., 2019). In 2019 which showed that 76.2% of children had more than one food allergen.

The predisposition to an inadequate immune response to antigen stimulation, reaginic or nonreaginic, is non-selective so that food allergies are often multiple and with high frequency are associated with inhalation and/or contact hypersensitivity (Radlović et al., 2016).

4. Types of Clinical Manifestations

Table 5

Distribution of Types of Clinical Manifestations

Types of Clinical Manifestations of Allergies	n	%
Asthma		
There is	12	22,2%
There isn't any	42	77,8%
Rhinitis		
There is	50	92,6%
There isn't any	4	7,4%
Recurrent Chronic Cough		
There is	38	70,4%
There isn't any	16	29,6%
Eczema		
There is	1	1,9%
There isn't any	53	98,1%
Sinusitis		
There is	4	7,4%
There isn't any	50	92,6%
Gastrointestinal Tract		
There is	1	1,9%
There isn't any	53	98.1%

Based on Table 5, it was found that the most frequently observed clinical manifestation was in the respiratory tract, namely rhinitis. This research is in line with research by (Feuerhake et al., 2018). in 2018 which showed that patients with food allergies most often showed symptoms of rhinitis as the clinical manifestation that appeared. One hypothesis states that ingested food particles can be inhaled into the airways, and exposure of allergenic proteins to mast cells in the lungs causes inflammation and therefore respiratory symptoms during an allergy attack (di Palmo et al., 2019).

Conclusion

Pediatric patients with food allergies at Dr. Soetomo Hospital Surabaya have the most profile characteristics with female gender, an average age of 6.07 years, with banana, tilapia, and cob allergen types, as well as respiratory tract symptoms in the form of rhinitis.

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