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## Comparison of Exclusive and Non Exclusive Breast Feeding with the Incidence of Allergic Rhinitis in Children

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### Abstract

Allergic rhinitis is common chronic disease in children and the incidence increases in children aged over 5 years. Exclusive breastfeeding may reduce the risk of allergic rhinitis due to its anti-allergen and anti-inflammatory properties. This study aimed to find the difference between children who were exclusively breastfed and did not exclusively breastfed to the incidence of allergic rhinitis in children. This analytic comparative with cross sectional study was conducted in Dr. Zainoel Abidin Hospital, Banda Aceh. Data collected from medical records and questionnaires completed by parents. A total of 35 children aged 5 to 18 years were collected using accidental sampling. The results shown 20 (57.1%) children had a history of exclusive breastfeeding and 15 (42.9%) children had a history of non-exclusive breastfeeding. About 22 (62.9 %) children suffering from intermittent allergic rhinitis, while other 13 (37.1 %) children suffering persistent allergic rhinitis. Fisher's exact test results shown statistically significant difference between Exclusive breastfeeding and non-exclusive breastfeeding to the incidence of allergic rhinitis in children aged 5 to 18 years ( $P=0.005$ ; OR 6.9 95% CI 1.78-26.85). In conclusion, children with a history of exclusive breastfeeding had a lower frequency of allergic rhinitis symptoms. It is suggested that children with a moderate or high risk of allergy to be given exclusive breast feeding in the first 6 months of life to reduce the incidence of allergic rhinitis in the future.

### Article Info

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### Keywords

Allergic rhinitis,  
Exclusive breast feeding,  
Children aged 5-18 years

### Introduction

Allergic rhinitis is a chronic upper airway disease induced by allergen exposure and produces an inflammatory process mediated by IgE with symptoms of rhinorrhea, sneezing, nasal congestion, and/or itching of the nose or eye (Tharpe and Kemp, 2015; Mims 2012). Allergic Rhinitis and its Impact on Asthma (ARIA), in

collaboration with World Health Organization (WHO), states that allergic rhinitis represents a global health problem affecting around 10 to 20% of the population and this number continues year to year (Broek *et al.*, 2010). The results of the International Study of Asthma and Allergies in Childhood (ISAAC) surveys shown the prevalence of allergic rhinitis varies worldwide. Prevalence in Southeast Asia around 5.5% to 44.2%

(Tong and Lin, 2015). Allergic rhinitis is not common in children under 2 years of age, since exposure to allergens usually takes several years to develop (Tharpe and Kemp, 2015). Research conducted by ISAAC shown genetic (family history of allergy), age of child, gender, frequent airway infections, antibiotics in the first year of life, have pets, breastfeeding, socioeconomic status and the process of cesarean delivery are common risk factor for allergic rhinitis (Ji *et al.*, 2016; Li *et al.*, 2015).

Allergic rhinitis disease should be prevented as early as possible. Giving exclusive breastfeeding in the first 6 months of life should be a preventive factors against allergic rhinitis. (Wuryanti and Wibowo, 2015; Friedman *et al.*, 2005; Adkinson, 2008). Previous study shown that children who did not receive exclusive breastfeeding has a prevalence of allergic rhinitis 12.4% higher than children who consumed exclusive breastfeeding (Ehlayel *et al.*, 2008).

## Materials and Methods

This analytic comparative with cross-sectional study was conducted in Dr. Zainoel Abidin Hospital Banda Aceh, the capital of Aceh Province, from September to December 2017. A total of 45 children aged 5 to 18 years were collected by accidental sampling. Children with a history of breastfeeding during infancy (aged 0 to 6 months) were included into inclusion criteria. Children suffering from infections and congenital problem were excluded in this study. Children had been diagnosed by an allergy and immunology specialist, based on examination and previous history of allergy and then divided into intermittent allergic rhinitis and persistent allergic rhinitis. Data collected from examinations, questionnaires completed by parents and medical records. Fisher's exact test were performed to analyze the obtained data. Data collected included age, sex, history of breastfeeding, and history of previous treatment. All analyses were performed with SPSS ver. 22.0 (IBM SPSS Statistics for Windows, Ver 22.0. Armonk, NY, USA). Test results revealed statistically significant if  $P$  value of  $<0.05$ .

## Results and Discussion

We obtained 45 children that fulfilled the inclusion criteria. Subject characteristics are shown in Table 1. Most of the subject aged between 5 to 11 years old (64.4%). In intermittent allergic rhinitis group, 81.2% of subjects feel slightly interrupted in performing daily activities, but in persistent allergic rhinitis group, 87.5%

of subjects feel very interrupted in performing daily activities. Exclusive breastfeeding during infancy (0 to 6 months) were given into 81.5% subjects in intermittent allergic rhinitis group. And in persistent allergic rhinitis group, 61.1% of subjects were given non exclusive breastfeeding during infancy. About 71.1% of subjects were grouped into low-moderate risk allergy.

Subject in intermittent allergic rhinitis group have slightly different numbers than in persistent allergic rhinitis group, 29 (64.4%) vs 16 (35.6%), respectively (Figure 1). 27 (60%) of total subjects were given exclusive breastfeeding during infancy (0 to 6 months) (Figure 2).

We analyzed the relation between variables in Table 2 using Fisher's exact test because chi-square test is not suitable. The result showed a statistically significant difference between allergic rhinitis and feeding history in infancy ( $P=0.005$ ). We also conducted a Maentel-Haenszel analysis to find the risk of allergic rhinitis on a history of breastfeeding. We found that children who consumed non exclusive breastfeeding will have 6.9 times higher to suffer persistent allergic rhinitis (95% CI 1.78-26.85).

Allergic rhinitis disease should be prevented as early as possible because this problem will inhibit the growth and development process of children (Wuryanti and Wibowo, 2015). Giving exclusive breast feeding should be a preventive factors against allergic rhinitis. This type of milk contains Transforming growth factor (TGF- $\beta$ ), CD-14, lactoferrin, and IgA which plays an important role in the prevention of allergen exposure and the development of allergies in children. TGF- $\beta$  improving the individual ability for producing inner IgA against substances that can trigger allergy as  $\beta$ -lactoglobulin, casein, gliadin, and ovalbumin that are normally on food or drinks. TGF- $\beta$  also inhibits the inflammatory process of T helper-2 cells, modulates antigens presenting cell (APC) and induces IgA production. High level of CD-14 content in breast milk will play a protective function from allergic development. Lactoferrin helps to accelerate gastrointestinal maturation that can prevent allergies. Secretory IgA in breast milk also helps the intestine from allergic events by coating the intestinal barrier mucosa to prevent the occurrence of allergen sensitization (Friedman *et al.*, 2005; Adkinson, 2008). Ehlayel *et al.*, (2008) states that children who did not receive exclusive breastfeeding has a prevalence of allergic rhinitis 12.4% higher than children who consumed exclusive breastfeeding.

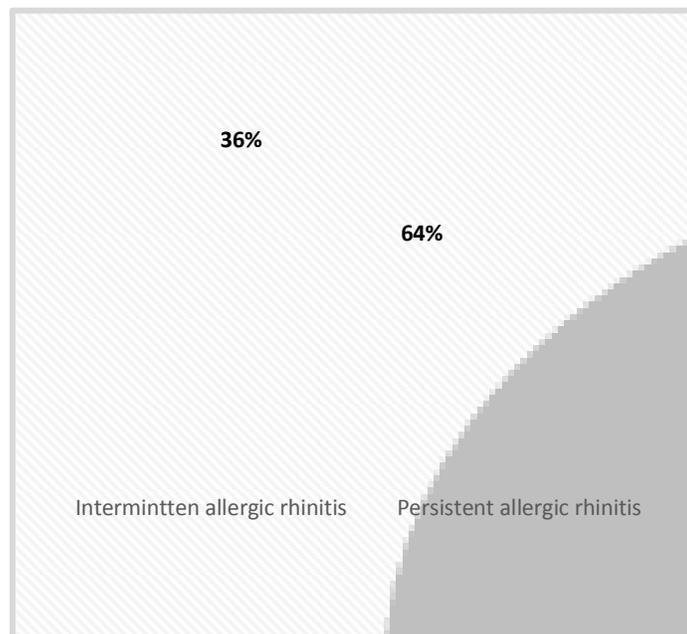
**Table.1** Subject characteristics

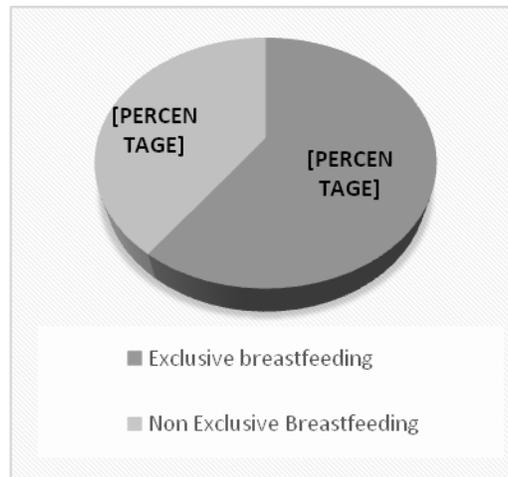
Variable	Intermittent allergic rhinitis		Persistent allergic rhinitis		Total
	n	%	n	%	n (%)
<b>Gender</b>					
Male	15	65.2	8	34.8	23 (51.1)
Female	14	63.6	8	36.4	22 (48.9)
<b>Age</b>					
Child (5 to 11 years)	20	69	9	31	29 (64.4)
Early adolescent (12 to 16 years)	8	57.1	6	42.9	14 (31.2)
Teenager (17 to 18 years)	1	50	1	50	2 (4.4)
<b>Interrupted activity</b>					
Not interrupted	2	40	3	60	5 (11.1)
Slightly interrupted	26	81.2	6	18.3	32 (71.1)
Very interrupted	1	12.5	7	87.5	8 (17.8)
<b>Allergy Risk</b>					
Low-moderate	23	71.9	9	28.1	32 (71.1)
High	6	46.2	7	53.8	13 (28.9)

**Table.2** Bivariate analyzed between allergic rhinitis and breast feeding

Variable	Allergic rhinitis		P	OR	95% CI
	Intermittent: n (%)	Persistent: n (%)			
<b>Feeding history</b>					
Exclusive breastfeeding	22 (81.5)	5 (18.5)	0.005	6.9	1.78-26.85
Non exclusive breastfeeding	7 (38.9)	11 (61.1)			

**Fig.1** Comparison of intermittent and persistent allergic rhinitis



**Fig.2** Comparison of exclusive and non exclusive breast feeding

Similar in our results, allergic rhinitis and feeding history in infancy shown a statistically significant difference where children who consumed non exclusive breast feeding will have 6.9 times higher to suffer persistent allergic rhinitis ( $P=0.005$ ; 95% CI 1.78-26.85).

Allergic rhinitis does not cause the death but can affect the quality of life because of sleep disturbance, decreased concentration and work productivity, decreased performance in school and social activities and even psychological disorders such as depression if allergicsymptom becomeworsening (Rotiroti and Scadding, 2016; Wuryanti and Wibowo, 2015).

Allergic rhinitis in fact disturbs the patient in performing daily activities. About 81% of subjects suffering from intermittent allergic rhinitis experienced slightly interrupted in performing daily activities, while 87% of patients who had persistent allergic rhinitis experienced severe interrupted inperforming daily activities.

This is in accordance with study conducted by Eli O. Meltzer (2016) which states that allergic rhinitis can affect the quality of life in a person including physical and socialdaily activities, sleep disturbances, fatigue, irritability, depression, attention deficit, memory and learningdisturbance.

Allergy symptoms are also related to genetics. This symptoms were found in 39.8% of children if their mother has a history of allergy and 30.2% if their father has the symptoms of allergy (Johansson *et al.*, 2004). We divide allergic risk factors into low-moderate and high risk of allergy based on family history. 72% of allergic rhinitis children were included into low-moderate group.

In conclusion, Allergic rhinitis does not cause the death but can affect the quality of life especially make the sufferer experienced sleep disturbances, fatigue, irritability, depression, attention deficit, memory and learning disturbances. Allergic rhinitis and feeding history in infancy showed a relation where children who consumed non exclusive breastfeeding will have 6.9 times higher to suffer persistent allergic rhinitis. It is highly recommended to be given exclusive breastfeeding during infancyasa preventive factors against allergic rhinitis.

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