

Nutritional status of infants with cow's milk allergy who consume breast milk *vs.* hypoallergenic formula

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Abstract

Background Infants with cow's milk allergy (CMA) are prone to malnutrition because of their inability to absorb nutrients due to bowel inflammation. Breast milk and hypoallergenic formula are considered to be the best sources of nutrition for infants with CMA.

Objective To compare the nutritional status of infants with CMA who consumed breast milk or hypoallergenic milk.

Methods We conducted a cross-sectional study on 63 infants with CMA, aged 3-6 months, who were collected by consecutive sampling. Infant nutritional status was measured by anthropometric examination, and classified as well-nourished (-2 to 2 SD) or malnourished (<-2 or >2 SD). Data on type of milk consumption was collected through interviews of subjects' parents/caregivers.

Results Most subjects were well-nourished (75%). Similar percentages of infants with CMA consumed breast milk and hypoallergenic formula (51% vs. 49%, respectively). There was no significant difference in nutritional status between subjects who consumed breast milk vs. hypoallergenic milk ($P=0.61$).

Conclusion The nutritional status of infants with CMA is not significantly different between those who consumed breast milk and those who consumed hypoallergenic formula. Therefore, we recommend giving either breast milk or hypoallergenic milk to infants with CMA for the first 6 months of life to reduce their exposure to cow's milk proteins. [Paediatr Indones. 2016;56:251-6. doi: 10.14238/pi56.4.2016.251-6].

Keywords: nutritional status, breast milk, hypoallergenic formula, cow's milk allergy

Food allergies occur in 2-3% of infants, most of which are caused by cow's milk protein sensitization. The incidence of cow's milk allergy (CMA) in the first year of life has continued to increase through the years.¹ Infants with CMA are prone to malnutrition because of their inability to absorb nutrients due to bowel inflammation. Infants with CMA need aggressive feeding of breast milk or hypoallergenic formula, such as partially hydrolyzed milk, to achieve catch up growth and avoid malnutrition.²

Although breast milk and hydrolyzed formula do not prevent the appearance of allergy symptoms, they may reduce the incidence of food allergies and help infants avoid malnutrition. In addition, giving breast milk in the first 6 months of life is a cost-effective approach to provide the best nutrition for infants with CMA.²⁻⁴ We aimed to compare the nutritional status of infants with CMA who consumed breast milk *vs.* hypoallergenic formula.

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Methods

We conducted a cross-sectional study at the Pediatric Allergy and Immunology Clinic in Banda Aceh, from April to December 2013. We enrolled 63 infants with CMA. The inclusion criteria were infants aged 3-6 months, who were fed only breast milk or hypoallergenic formula for at least a month, had normal birth weight, CMA, and no other physical problems. Infants with CMA were collected by consecutive sampling, and had been diagnosed by a pediatric allergy and immunology specialist, based on history of CMA manifestations and skin prick tests of cow's milk allergens.

Data on the types of milk consumed were collected directly from parents/caregivers through interviews. Anthropometric examinations were performed to determine infant nutritional status, according to the Ministry of Health Republic of Indonesia standards.⁵ Infant weight was measured using a Secca scale with 0.1 kg accuracy, and body length was measured using a standard length board, with 0.1 cm accuracy. Infant weight-for-height ratios were plotted in the form of ratio based on the Ministry of Health Republic of Indonesia Growth Curves.⁵ Then subjects were categorized as having well-nourished (-2 to 2 SD) or malnourished (<-2 or >2 SD) nutritional status. Infant age, sex, and birth weight were collected from medical records.

The distribution pattern is shown in a descriptive table. We used Chi-square test to assess for associations between categorical variables. Results with P

values <0.05 were considered to be statistically significant. This study was approved by the Ethics Committee of Syiah Kuala University Medical School, Banda Aceh.

Results

Sixty-three infants with cow's milk allergy were enrolled in this study. Subjects' characteristics are shown in **Table 1**. Most subjects were well-nourished (75%) and 52% were male. Similar percentages of subjects consumed breast milk and hypoallergenic formula (51% vs. 49%, respectively).

Approximately 72% of the 32 subjects who consumed breast milk were well-nourished, while 28% were malnourished (**Figure 1**). Of 31 subjects who consumed hypoallergenic formula 77% were well-nourished and 23% were malnourished (**Figure 2**). Chi-square test revealed no significant difference in nutritional status of infants with CMA in the breast milk and hypoallergenic formula groups (P=0.61).

Table 1. Subjects' characteristics (N=63)

Characteristics	(N=63)
Gender, n (%)	
Male	33 (52)
Female	30 (48)
Type of milk, n (%)	
Breast milk	32 (51)
Hypoallergenic formula	31 (49)
Nutritional status, n (%)	
Well-nourished	47 (75)
Malnourished	16 (25)



Figure 1. Comparison of nutritional status in the breast milk consumption group

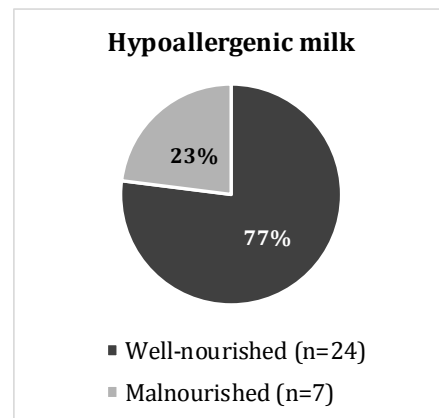


Figure 2. Comparison of nutritional status in the hypoallergenic milk consumption group

Discussion

Malnutrition is associated with growth and development disorders, particularly delays in motor development. Malnutrition in infants with CMA is a consequence of sensitization to cow's milk proteins, which cause bowel inflammation. Impaired absorption of nutrients for long periods due to chronic inflammatory mechanisms results in failure to thrive during infancy.⁶⁻⁸ Therefore, it is advisable to consume hypoallergenic formula, such as partially hydrolyzed milk or breast milk to avoid malnutrition.²

In this study, we found no differences in nutritional status of infants with CMA between those who consumed breast milk and those who consumed hypoallergenic formula. The lack of difference is understandable, since both types of milk are excellent sources of nutrition for infants with CMA.^{9,10} Similarly, a previous cohort study conducted in 2,252 full-term neonates with atopic heredity, reported no significant differences in body mass index among infants who received either breast milk or hypoallergenic milk formula in the first year of life.¹¹

Breast milk has a very important role in the growth and development of infants. *It is the best source of nutrition for infants*, as it is a cost-effective and appropriate method to nourish infants and minimize the risk of atopic disease. Breast milk also contains many nutrients that prevent malnutrition during infancy. Breastfeeding typically generates better nutritional status for all anthropometric indexes. Furthermore, breast milk reduces the risk of obesity in the future.^{3,9}

Infants with CMA who do not receive breast milk or if breast milk is insufficient, should be given supplementation with a partially or extensively hydrolyzed formula. These types of milk formula is recommended for the first 6 months of life as a substitute to reduce exposure to cow's milk proteins and have been used therapeutically when infants exhibit protein-related intolerant milk allergies. These formulas were developed with adequate nutritional profiles and have been safely used as a human milk alternative globally for decades in millions of infants.^{10,12}

Our study had several limitations. It was performed at only one pediatric allergy and immunology clinic. Also, the short observation period may have

prevented us from observing malnutrition in our subjects. Further studies with a larger number of subjects and longer observation period should be conducted to provide adequate results and develop a more optimal nutritional feeding pattern for infants with CMA to catch up in growth and avoid malnutrition in the future.

In conclusion, there are no differences in nutritional status of infants with CMA between those who consumed breast milk vs. hypoallergenic formula. Therefore, we recommend giving breast milk or hypoallergenic formula to infants with CMA for the first 6 months of life to reduce exposure to cow's milk proteins.

Conflict of interest

None declared.

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