



Research Article

Relationship between Baby Weight with Alfa-Lactalbumin Content in Breast Milk in the Working Areas of Sudiang Raya Community Health Center Makassar City

Siti Uswatun Hasanah^{1*}, Citrakesumasari¹ and Apik Indarty Moedjiono²

¹Nutrition Department, Faculty of Public Health, Hasanuddin University, Indonesia

²Biostatistics Department, Faculty of Public Health, Hasanuddin University, Indonesia

*Corresponding Author

Siti Uswatun Hasanah
Email:

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Abstract: ASI (Breast Milk) is the best food for babies that has many benefits and is designed to meet the needs of the baby according to his condition. One special component that has benefits for the growth and development of infants is alpha-lactalbumin. This study aims to determine the relationship of birth weight of babies with levels of alpha-lactalbumin in breast milk. The total sample of 46 breastfeeding mothers in the working area of the Sudiang Raya Health Center in Makassar City. Data collected; subject characteristics, infant birth weight, and mother's breast milk sample. Statistical analysis using the chi-square test. The results showed that most (97.8%) birth weight of infants was normal (≥ 2.5 kg). For the alpha-lactalbumin level, most of the subjects had alpha-lactalbumin levels with fewer content categories, namely 44 samples (95.7%), whereas subjects with normal levels only consisted of 2 samples (4.3%). From the results of the chi-square test showed that the p-value was not significant ($p > 0.05$), which is $p = 0.829$, which means there was no relationship between the birth weight of the baby with the levels of alpha-lactalbumin in breast milk. Exclusive breastfeeding requires the support of all parties, bearing in mind the technical constraints of mothers regarding the lack of in-depth socialization and education related to the benefits of various components of ASI.

Keywords: Alpha-lactalbumin, Infant Birth Weight, Nursing Mothers.

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INTRODUCTION

Exclusive breastfeeding in the first 6 months reduces morbidity from gastrointestinal and allergic diseases, as well as negative effects on growth. With this evidence, it is recommended that in the first six months of life, every child must be exclusively breastfed, with partial breastfeeding continued until the age of two years (Bernardo *et al.*, 2013) Global Breastfeeding Scorecard, evaluating 194 countries, found that only 40 percent of children under of the six months exclusively breastfed and only 23 countries have exclusive breastfeeding rates above 60 percent (WHO, 2013)

Initiation of lactation, the Birth weight of the baby, skin-to-skin contact between mother and baby during the first hour after birth (IMD) is also one of the factors that can produce increased breastfeeding and can affect the composition and quality of breast milk (Kent *et al.*, 2016).

The percentage of Low Birth Weight Babies (LBW) in South Sulawesi in 2013 was 12.4%. The latest data from the Basic Health Research (RISKESDAS) in 2018 states that South Sulawesi Province is among the top 10 highest provinces for LBW incidence above the national rate (Health Research and Development Agency Ministry of Health Republic of Indonesia, 2018). These data indicate that serious attention is needed

because the risk of LBW is quite large for the growth and development of infants. The main cause of low birth weight is premature birth (birth before the womb reaches 37 weeks) (Ziegler *et al.*, 2002).

Babies born with low weight will have an increased risk for complications and obstacles in growth and development. Breast milk that has been designed to meet the needs of infants according to their conditions can be useful to reduce the incidence of low intelligent quotient (IQ).

One component of breast milk contained in breast milk is alpha-lactalbumin. Alpha-Lactalbumin is the main protein in breast milk and is an important nutrient for babies. Alfa-Lactalbumin has various benefits including the process of growth and development and plays a role in the immune system of infants (Donald, 2018). Other studies revealed that the levels of alpha-lactalbumin were 37% higher at the stage of mature breast milk than in colostrum and increased during lactation even when total protein concentration decreased (Goonatilleke *et al.*, 2019).

Exclusive breastfeeding requires the support of all parties given the technical constraints of the mothers related to the lack of socialization and in-depth education related to the benefits of the ASI component.

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METHODOLOGY

Research Design

This research was conducted in the working area of the Sudiang Raya Health Center in Makassar City. This research uses quantitative methods with *cross-sectional study* design

Population and Sampling

The population in this study were all breastfeeding mothers in the Sudiang Raya Community Health Center in Makassar. A total of 46 samples were selected positively with inclusion criteria. Age of breastfeeding infants aged 14 days - 6 months and agreed with informed consent. This study was approved by the Ethics Committee of the Faculty of Public Health, Hasanuddin University, Makassar.

Data Collection

Data on the subject's characteristics included maternal age, education, occupation, BMI during pregnancy and parity, age of the baby and sex of the baby obtained through direct interviews with the subjects. Birth weight data is obtained through the KMS (Menuju Sehat Card) owned by each baby. The mother's breast milk sample received after the interview process, where the ASI sample was taken using a breast pumping device and then tested for alpha-lactalbumin levels at the Unhas Hospital Laboratory using the ELISA method

Data Analysis

Data on subject characteristics and infant birth weight were analyzed using the Windows version of the SPSS 24 program. To connect the two variables in this study using the *chi-square* test

RESULTS

Sample Characteristics

Tabel 1. Subject's Characteristics

Subject's Characteristics	Total (n=46)	
	n	%
Mother's Age		
20-24	9	19,6
25-29	37	80,4
Education		
Graduated from Elementary School	3	6.5
Junior School	8	17.4
High School	20	43.5
Diploma	5	10.9
Bachelor	10	100.0
BMI (Body Mass Index)		
Thin	1	2.2
Normal	25	54.3
Fat	10	21.7
Obesity	10	21.7
Breastfeeding experience		
Experienced	27	58.7
Inexperienced	19	41.3
Baby's Age (Month)		
1-3	9	19.6
4-6	37	80.4
Baby's Sex		
Male	24	52.2
Female	22	47.6

Age of mothers ranged from 25-29 years (80.4%) All mothers do not work (IRT), Most of the educated are high school (43.5%). The majority of mothers claimed to have experienced breastfeeding in their first child (58.7%). Most of the mothers had

a BMI (Body Mass Index) in the normal category (54.3%). The age of most infants ranges between 4-6 months (80.4%) which is dominated by male babies (52.2%) (table 1).

**Baby Birth Weight
Table 2. Birth weight**

Cut of point 2,5 kg		
Baby Birth Weight	Total (n=46)	
	n	%
Low birth weight babies	1	2.2
Normal	45	97.8
Cut of point 3,0 kg		
Baby Birth Weight	Total (n=46)	
	n	%
Low birth weight babies	20	43.5
Normal	26	56.5

Table 2 shows that most (97.8%) infant birth weights were dominated by normal birth weights with a cut of point> 2.5

kg. the birth weight of babies is also mostly in the normal category with a cut of point> 3.0 kg (56.5%),

This shows that the birth weight of babies, both using a cut of point > 2.5 kg as the standard set for normal birth weight

limits in Indonesia and using a cut of point > 3.0 kg indicates that the baby's birth weight remains in the normal category.

Alfa-Lactalbumin Levels of Mother's Milk

Table 3 Alfa-lactalbumin

Kategori Alfa-lactalbumin	Total (n=46)	
	n	%
Rendah	44	95.7
tinggi	2	4.3

Table 3 shows that the majority of maternal breast milk samples had low alpha-lactalbumin levels (95.7%) and only

2 mothers had breast milk samples with alpha-lactalbumin levels that exceeded the minimum average of 2.8 g/L.

Relationship of Infant Birth Weight with Alpha-Lactalbumin ASI Levels

Table 4 Relationship between birth weight and alpha-lactalbumin levels

Cut of point 2.5 kg				
Alf-lactalbumin Level	Birth weight		Total n (%)	- value
	Low birth weight babies %	Normal %		
Low	1 (2,2)	43 (93,5)	44 (95,7)	0,829
High	0	2 (4,3)	2 (4,3)	
Cut of point 3,0 kg				
Alf-lactalbumin Level	Birth weight		Total n (%)	P-value
	Low birth weight babies %	Normal %		
Low	19 (41,3)	25 (54,3)	44 (95,7)	0,849
High	1 (2,2)	1(2,2)	2 (4,3)	

Table 4 shows subjects with low levels of alpha-lactalbumin ASI having normal infant birth weight using a cut point of 2.5 kg (93.5%), as well as subjects with high levels of alpha-lactalbumin ASI had normal birth weight (4.3) %. Therefore, the chi-square test results showed that the p-value was not significant ($p > 0.05$) as well as using a 3.0 kg cut of point. the results obtained are low levels of alpha-lactalbumin breast milk owned by infants with normal birth weight (54.3%) and high levels of alpha-lactalbumin breast milk owned by each one based on the birth weight of the baby both in the LBW and normal categories. Each P value is $p = 0.829$ and $p = 0.849$. It means that there is no relationship between the birth weight of the baby and the levels of alpha-lactalbumin in the mother's milk.

DISCUSSION

The main objective of this study was to determine the relationship between the birth weight of infants and maternal alpha-lactalbumin levels in the working area of the Makassar City health center. The level of alpha-lactalbumin in mother's milk is divided into 2 categories, namely low and high using a minimum average standard of 2.8 g / L. This study shows that the average alpha-lactalbumin level of all samples is low, 1.9 (< 2.8 g/L) (Kelly *et al.*, 2009).

The component of breast milk varies greatly among mothers as well as alpha-lactalbumin. This multidimensional variation in composition is believed to be an illustration of the baby's needs and food supply. Variations in the composition of breast milk between mothers are reported in response to cultural differences such as diet and the presence of human genetic differences (Jackson *et al.*, 2004; Quinn *et al.*, 2012; Butts *et al.*, 2018).

This study revealed that the birth weight of infants did not have a significant relationship ($p > 0.05$) either using a cut point of 2.5 kg birth weight or 3.0 kg birth weight. This revealed that the birth weight of the baby at birth would not affect alpha-lactalbumin levels in mother's milk so it can be concluded that the components of alpha-lactalbumin levels were the same in

mother's milk as well in children with low and normal birth weight.

This is in line with research conducted by Fatwa (2014) explaining that there is no significant relationship between birth weight and alpha-lactalbumin levels of breast milk using a cut point of 2.5 kg but at a cut point of 3.0 kg showed significant results. The Barker Hypothesis (1998) explains that smaller babies, less than 3.0 kg, have a higher risk of developing degenerative diseases as adults.

Alpha-Lactalbumin is the main protein in breast milk and is an important nutrient for babies. Other studies have revealed that levels of alpha-lactalbumin 37% higher in mature breast milk than in colostrum and increase during lactation even when total protein concentration decreases (Goonatilleke, 2019). The content of alpha-lactalbumin in breast milk shows considerable variation. In addition to the birth weight of the baby at birth, this variation is closely related to other factors such as the mother's condition both in nutritional status and food intake (Forsum, 1976).

Further research is needed related to alpha-lactalbumin levels which are related to nutritional status and maternal intake. So that later can complete the conclusion that the factors that most play a role in influencing alpha-lactalbumin levels in breast milk both from mother and baby factors. although the birth weight of a baby is not related to alpha-lactalbumin levels, the improvement of infant and maternal nutrition is an important interrelated factor in supporting the quality and quantity of breast milk which also plays a role in printing the nation's generation.

CONCLUSION

There was no relationship of birth weight of babies with the levels of Alfa-lactalbumin in the breast milk of mothers in the Work Area of the Sudiang Raya Health Center in Makassar City ($p = 0.829$). Exclusive breastfeeding requires the support of all parties given the technical constraints of the mothers related to

the lack of socialization and in-depth education related to the benefits of the ASI component.

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