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Secretory IgA, IgG, and IgM Antibodies Contributions in Breast Milk and Risk of Wasting of Babies 7-24 Months

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Abstract: Wasting is a nutritional problem that can hamper the growth of children under five and affect their future productivity. The prevalence of wasting at Wolo Puskesmas in 2018 was 15.2%, then increased to 26.1% in 2022. Objectives: To determine the risk factors for wasting in under two yearsaged 7-24 months in the Work Area of the UPTD Wolo Health Center, Kolaka Regency. This is an observasional analitic research with a case control study design. The population was all under two yearsaged 7-24 months who experienced wasting as many as 25 people and the sample of this study were all under two yearsaged 7-24 months who experienced wasting as many as 25 people and control as many as 25 people. Sampling of cases using total sampling and control using a matching system. Data on exclusive breastfeeding were obtained through interviews and from the KIA book and records at the Health Center, and wasting was obtained from measurements of body weight and height. Data were analyzed using the Odd Ratio (OR) test. Exclusive breastfeeding are risk factors for wasting protection in children aged 7-24 months.This study suggests for mothers who have Baduta to be able to provide nutritious food to protect the IgA, IgG, dan IgM secretoric and regulate Baduta's diet so that it can improve the nutritional status of Baduta and for the Wolo Health Center to routinely provide education about nutrition since pregnant women.

Keywords: Antibodies; Breast Milk; IgA; IgG; IgM

Introduction

Nutritional status is an indicator of the success of development (Calder et al., 2020; Ueda et al., 2020). One of the nutritional problems that is still of concern is wasting, which is a state of malnutrition, especially in under-five children. The fatal impact of malnutrition in under-five children is the disruption of physical growth and intelligence and can determine work productivity or economic growth (UNICEF, 2015). According to WHO data, more than 50% of infant and child deaths are related to undernutrition and malnutrition (WHO, 2014). The World Health Organization (WHO) also states that 22% of infant deaths are related to malnutrition, which is often related to breast milk intake. The high infant mortality rate in the world can be avoided by breastfeeding (Marinelli et al., 2019; WHO, 2016).

The results of the Kemenkes (2018) Basic Health Research showed that the prevalence of undernutrition in under-five children in Indonesia based on BMI did not experience a significant decrease from 13.9% in 2013 to 13.8% in 2018 (Kadir, 2019; Zulkifli et al., 2022). One of the provinces in Indonesia with a high prevalence of underweight in under-five children is Southeast Sulawesi, which was 8.53% in 2016 and became 10.10% in 2017, then the prevalence of very thin was 3.14% in 2016 and increased to 5.90% in 2017 (Kemenkes, 2018b). Based on data from the 2017 Nutrition Status Monitoring (PSG), Kolaka Regency ranks second with the highest prevalence of undernutrition after Bombana Regency at 18.8% and is classified as an acute-chronic public health problem (Kemenkes, 2018).

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Data obtained from the Kolaka District Health Office shows that wasting status has increased over the past 3 years, namely in 2018 by 19.26% and in 2019 by 28.18%, as well as in 2020 wasting coverage of 31.34%, in 2018 exclusive breastfeeding coverage reached 75.2%. This is still far from the Minimum Service Standard (SPM) for exclusive breastfeeding, which is 85% (Kolaka, 2019).

One of the parameters to determine the nutritional status of pregnant women is the anthropometric indicator of Upper Arm Circumference (LiLA) in mothers, where insufficient energy and protein intake in pregnant women can cause Chronic Energy Deficiency (CHD). Pregnant women with SEZ during pregnancy are at risk of wasting in under-five children. Pregnant women with low nutritional intake and infectious diseases will give birth to babies with low birth weight (LBW). A child's life from the mother's womb until the age of two (1,000 HPK) is a critical period in supporting optimal child growth and development (Ariani, 2017; Gultom & Patriawati, 2022; Latiana et al., 2021).

Research by Rochmawati et al. (2016), found that the characteristics of mothers of toddler wasting based on the type of work of the respondents were known that most of the respondents were housewives (Raihan & Mahmudiono, 2022), namely 95.5% and the education level of the respondents was mostly elementary school graduates, namely 37.9%. Then research by Mustaghfiroh et al. (2020), found that there were differences in the birth weight of babies in pregnant women with Chronic Energy Deficiency (KEK), besides that research by Ramadhana et al. (2019), showed that babies who experienced malnutrition were more in babies who were not exclusively breastfed (Menalu et al., 2021). According to Mufida, suggests that the growth and development of under-fives is largely determined by the amount of breast milk obtained including energy and other nutrients contained in breast milk. Breast milk without other food ingredients can meet the needs of growth around 6 months of age, called exclusive breastfeeding (Mufida et al., 2015).

One of the government programs in overcoming the problem of malnutrition in underweight children is the 1000 HPK program, which intervenes from the time the baby is in the womb in the form of adequate nutrition for pregnant women to exclusive breastfeeding. This program is a nutritional program that aims to restore the nutrition of underweight children by providing food with sufficient nutritional content so that the nutritional needs of underweight children can be met (Kemenkes, 2016). However, the implementation of exclusive breastfeeding has not been maximized.

Puskesmas Wolo is one of the working areas of the Kolaka District Health Office which has the most infant targets and the highest coverage of nutrition problems compared to other Puskesmas and the prevalence of wasting has increased in the last 3 years, namely in 2018 by 15.2%, then increased to 26.1% in 2019 (Wolo, 2020). The working area of Puskesmas Wolo consists of 14 villages and there are 9 villages that have wasting children, namely Lalonaha village 2 people, Iwoimopuro 3 people, Ulu Wolo 2 people, Lalonggopi 2 people, T.Ponrewaru 4 people, Samaenre 1 person, Lapao Pao 3 people, Muara Lapao-Pao 5 people and Ulurina village as many as 3 people, so that the total number of wasting children in 2020 is 25 people (Wolo, 2020). Based on this, the researcher is interested in conducting research on exclusive breastfeeding on the incidence of wasting in under-five children aged 7-24 months in the working area of Puskesmas Wolo, Kolaka Regency.

Method

Research This type of research is observationalanalytic research, which is research that wants to analyze the difference between the dependent and independent variables, namely the risk factors of maternal employment, maternal education, nutritional status of SEZ during pregnancy and exclusive breastfeeding. This research design uses a case control study design, which is a group of control subjects from individuals who are as far as possible the same condition as the case subjects (Sugiyono, 2015).

The population of this study were all under-five children aged 7-24 months who experienced wasting in the Working Area of UPTD Puskesmas Wolo, Kolakas Regency, as many as 25 people. The sample of this research is some of the 7-24 months old Baduta who experience wasting in the work area of UPTD Puskesmas Wolo Kolaka Regency consisting of case and control samples.

Sample size

The case sample was 25 children aged 7-24 months who experienced wasting. The control sample was 25 children aged 7-24 months who did not experience wasting. The control sample size was equalized with the case sample with a ratio of 1: 1 so that 25 cases: 25 controls.

Sampling technique

The case sampling technique is to use total sampling, namely the entire population is used as a research sample. The control sampling technique is to use a matching system, namely matching the gender and age of toddlers. Matching is equalizing between cases and controls, for example if the case is male, then the control is also male and if the case is 9 months old then the control is also 9 months old.

Research Variables

The dependent variable is nutritional status (wasting). Independent variable is exclusive breastfeeding with Secretory IgA, IgG, and IgM content.

Types and Methods of Data Collection
Primary data includes

Sample identity, namely mother's age, Clown's age, and Clown's gender aged 7-24 months, obtained by interview using a questionnaire. Data on mother's occupation, mother's education and exclusive breastfeeding were obtained by asking directly to mothers who had newborns using a questionnaire. Data on wasting nutritional status was measured using the BB/TB index, where body weight was obtained using a dacin and height data was obtained by measuring it using a microtoice.

Secondary data included

Data on SEVERITY was obtained by observing the results of LLA measurements on pregnant women with SEVERITY observed in the MCH book of pregnant women or tracing SEVERITY data in the MCH register book documented in the working area of Puskesmas Wolo, Kolaka Regency. Puskesmas profile data consisting of area location, staffing and infrastructure facilities obtained from documentation at Puskesmas Wolo, Kolaka Regency.

Data Processing and Analysis

Data processing is done with several stages in order to obtain accurate data. The data processing on each variable. Data on maternal education occupation, exclusive breastfeeding were processed by comparing the results of interviews against the objective criteria of each variable. Data on the SEZ status of mothers during pregnancy was processed by comparing the LILA data of SEZ pregnant women according to the last measurement data recorded in the MCH book with the objective criteria of SEZ, namely experiencing SEZ if LILA < 23.5 cm.

Wasting status data was processed by calculating nutritional status using the BW/TB index with the help of WHO-Antropometry software so that data on body weight, height, age and sex of the under-five children were entered into the application and the results of Z-Score measurements could be obtained automatically.

Univariate analysis is an analysis carried out to obtain a description or painting of a group of people or an object by tabulating data, frequency, distribution of people, places and times. The description or painting is systematic, factual, accurate about the nature of the factors and their relationship between the phenomena being investigated (Siregar, 2015). The univariate variables analyzed were the distribution of samples according to the age of the Baduta, the sex of the Baduta, the age of the mother, exclusive breastfeeding, and the distribution of the nutritional status of the Baduta.

Bivariate analysis is to use Odd Ratio analysis to determine the risk factors between the independent variable and the dependent variable using the Odd Ratio test, using a 2 x 2 table.

Result and Discussion

Exclusive breastfeeding among mothers of 7-24 months old in the working area of UPTD Puskesmas Wolo, Kolaka Regency.

The results showed that of the 50 samples, most did not provide exclusive breastfeeding as much as 64.0% and the rest provided exclusive breastfeeding as much as 36.0%. Exclusive breastfeeding is given when the baby is 0-6 months old. Breast milk (ASI) is exclusive food for babies. The nutritional value contained in breast milk is so high that babies do not need any additional composition from outside. Exclusive breastfeeding means that the baby is only given breast milk without being given additional solid foods such as bananas, papaya, milk porridge. Exclusive breastfeeding is recommended for a period of up to 6 months. Breast milk is the best food for babies, especially in the first months of life. Breast milk contains all the nutrients to build and provide the necessary energy. Breast milk is the main and most perfect food source for infants aged 0-6 months, which is then called exclusive breastfeeding (Ariani, 2017).

The growth and development of infants is largely determined by the amount of breast milk obtained including energy and other nutrients contained in breast milk. Breast milk without other food ingredients can meet the needs of growth around 6 months of age, called exclusive breastfeeding (Mufida et al., 2015). Exclusive breastfeeding is also included in one of the government programs in overcoming the problem of nutrition wasting (thin) in under-five children is the 1000 HPK program where since the baby is in the womb, interventions are carried out in the form of adequate nutrition in pregnant women to exclusive breastfeeding. This program is a nutritional program that aims to restore the nutrition of underweight children by providing food with sufficient nutritional content so that the nutritional needs of underweight children can be met (Kemenkes, 2016).

Wasting status of under-five children aged 7-24 months in the working area of UPTD Puskesmas Wolo Kabupaten Kolaka.

The results showed that out of 50 samples, there were 25 people (50.0%) with normal nutritional status (control) and 25 people (50.0%) with wasting nutritional status (case).Nutritional status is an expression of a state of balance in the form of certain variables, or a

manifestation of nutriture in the form of certain variables. Nutritional status is a measure of the fulfillment of nutritional needs obtained from the intake and use of nutrients by the body. The dependent variable is the nutritional status of toddlers using the index of body weight according to height (BB / TB). Data collection for anthropometric data on body weight and height of toddlers is obtained directly from the results of weighing at monthly activities at the posyandu.

According to Mardalena, who quoted directly from Lie goan hong, the diet is a variety of information that provides an overview of the types and amounts of food ingredients eaten every day by one person and is characteristic of a particular community group. In general, newborn infants have an irregular feeding schedule, and infants can eat 6-12 times or more in 24 hours without a regular schedule. Breastfeeding can be done every 3 hours because the stomach of the newborn will be empty within 3 hours after breastfeeding. As the age increases, the distance between breastfeeding times becomes longer, because the stomach capacity is enlarged and the mother's milk production increases, then, after the baby is 6 months old, breast milk production decreases. Meanwhile, the needs of infants increase with age and weight, so that food intake from breast milk alone cannot meet the nutritional needs of infants. Therefore, from here on, newborns need additional food or other companions (Mardalena, 2017).

This research is reinforced by the theory put forward by (Supariasa et al., 2016) that wasting is a condition of nutrient deficiency due to the balance between consumption and absorption of these nutrients. The factors that influence wasting nutritional status are direct factors including food consumption and infectious diseases and indirect factors such as knowledge, occupation, maternal education, SEZ status of pregnant women, income level, number of family members, exclusive breastfeeding, and health services.

Risk factors for exclusive breastfeeding on the incidence of wasting in children aged 7-24 months in the working area of UPTD Puskesmas Wolo, Kolaka Regency.

The results of this study showed that in the group of mothers who were not exclusively breastfed, the incidence of wasting was higher in the case group compared to the control group and conversely the incidence of wasting in the control group was higher than the case group for mothers of toddlers who were exclusively breastfed. The results of the Odd Ratio (OR) test showed that exclusive breastfeeding was a protective risk factor for the incidence of wasting in toddlers aged 7-24 months, namely samples that were not exclusively breastfed had a risk of 1.42 times experiencing wasting compared to samples that were exclusively breastfed.

In this study, infants who received exclusive breastfeeding were more in the control group while toddlers who did not receive exclusive breastfeeding experienced more wasting in toddlers, this shows that toddlers who get exclusive breastfeeding nutritional needs obtained during infancy are in accordance with age and infants can avoid the possibility of infectious diseases caused by supplementary feeding other than breast milk because the content of breast milk is very good for infants because it contains immunoglobulins and other substances that provide immunity to infants against bacterial and viral infections. From the observations of researchers, there are still many toddlers who do not get exclusive breastfeeding, one of the causes is local culture and tradition which is usually a suggestion from the in-laws or parents of respondents that babies are given honey or plain water or mixed with sugar and even babies aged 0-6 months already get bananas, this is done from generation to generation so that babies do not get exclusive breastfeeding besides that there is still an understanding that if the baby gets formula milk, the baby will get fatter so it is not enough just to breastfeed. But there are also mothers who give.

This study is in line with the research of Ramadhana et al. (2019) which shows that infants who experience malnutrition are more in infants who are not exclusively breastfed. Similarly, research conducted by Ariani's proved that there was a significant relationship between breastfeeding history and the incidence of wasting with an OR value = 3.223. This means that respondents who have toddlers who are not exclusively breastfed tend to have a chance of wasting 3.223 times greater than respondents who have toddlers who are exclusively breastfed (Ariani, 2017).

This study is supported by the theory that infant feeding is one of the most important things to support the health and growth process of infants. Proper feeding of infants will prevent malnutrition and retardation, while inappropriate feeding increases the risk of enteral problems, infection and death (Hardinsyah & Supariasa, 2016).

Conclusion

The exclusive breastfeeding in the working area of UPTD Puskesmas Wolo Kabupaten Kolaka mostly did not provide exclusive breastfeeding as much as 64.0%. Wasting status in 7-24 months old under-fives in the working area of UPTD Puskesmas Wolo Kabupaten Kolaka was 50.0% normal nutritional status (control) and 50.0% experienced wasting (case). Exclusive breastfeeding has a risk of wasting in 7-24 months old children in the working area of UPTD Puskesmas Wolo, Kolaka Regency, which means that samples that are not

exclusively breastfed have a 1.42 times risk of wasting compared to samples that are exclusively breastfed. For mothers who have children with wasting nutritional status, it is expected that they can provide adequate food to the children and take the time to take care of the children, especially in managing their diet so that they can improve their nutritional status. For the Wolo Health Center, it is expected to routinely provide socialization about nutrition and exclusive breastfeeding since pregnant women so that nutritional information is provided early, so that the nutrients needed are fulfilled since the baby is still in the womb. For the government, especially the Wolo Health Center, to support the wasting handling program by providing facilities, infrastructure and funds in the development and implementation of nutrition programs in overcoming wasting at the Puskesmas.

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