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THE ASSOCIATION BETWEEN CHRONIC ENERGY DEFICIT (CED), ANEMIA IN PREGNANT WOMEN AND MALNUTRITION IN PEDIATRIC: AN EVIDENCE FROM AIMAS DISTRICT, SORONG REGENCY, WEST PAPUA PROVINCE, INDONESIA

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Abstract

Introduction: Stunting in children is still a problem in Indonesia. Addressing this issue, it is important to analyze the associated risk factors. One of them is a history of anemia and Chronic Energy Deficiency (CED) in pregnant women. This study aims to assess the relationship between a history of anemia and CED in pregnant women with the incidence of stunting in Aimas District.

Method: A case-control study design with an analytical approach was performed. The population was all children in Aimas District, aged over 6 months and a maximum of 5 years. Data collection was carried out in November 2021. The sampling method used was total sampling. An anthropometric instrument was conducted in confirming the diagnosis of malnutrition. Malnutrition is defined as undernutrition, malnutrition, and stunting. Anemia and CED were determined based on the maternal and child health book to obtain data on hemoglobin levels and upper arm circumference. Due to limited data, anemia and CED variables are one unit. The statistical test is Chi-Square with SPSS Statistics version 23.

Results: The total research subjects were 1060, spread over 26 Integrated Healthcare Centers. There were 174 subjects with malnutrition, divided into 22 with poor nutrition and 152 with stunting. The results of the bivariate analysis showed that anemia and CED in pregnancy are risk factors for malnutrition in children (OR = 12.35, P = 0.00).

Conclusion: Anemia and CED in pregnant women are risk factors for malnutrition in children in Aimas District.

Keywords: *Anemia, Chronic Energy Deficiency, Malnutrition, Stunting*

INTRODUCTION

Malnutrition is a serious problem due to a diet that does not contain sufficient nutrients. Malnutrition is divided into two, namely undernutrition and overnutrition.[1] Overnutrition type malnutrition which will be discussed in this paper. Undernutrition can manifest in four forms, namely wasting, stunting, underweight, and micronutrient deficiency.[2]

Wasting is defined as underweight for height. This condition is often indicated as severe weight loss. Usually occurs as a result of a person not getting adequate food intake, both in terms of quality and quantity, or someone is experiencing a chronic disease and or in the treatment of certain diseases.[2,3,4] Wasting conditions can lead to death if not treated quickly.[2]

Stunting is defined as an underweight for age. This condition is caused by undernutrition in the long term or repeated. Related to poverty, poor health of pregnant women, poor nutrition of pregnant women, and of course poor nutrition.[2,5,6,7] Especially in the first 1000 days of life.[2,8] Stunting conditions will prevent children from reaching their best potential. Both in terms of physical and cognitive function.[2,9]

Underweight is defined as being underweight for age. Children who are underweight are either stunted, wasted, or both.[2] Stunting and stunting are not the same. Stunting means an ongoing process, while stunted means the child is "finished" from the ongoing process.[10]

Micronutrient deficiency is a deficiency of vitamins and minerals that are essential for the body's physiology and metabolism, such as enzymes, hormones, and other substances related to growth and development.[2] If this condition occurs, of course one's performance will not be optimal.[12]

Malnutrition in children is a multifactorial condition. There are many interrelated risk factors. Starting from maternal factors, factors after the child is born, social factors, and economic factors. However, what will be discussed from this study are factors from the mother, namely anemia in pregnancy and Chronic Energy Deficiency (CED/.[13,14] The aim of this study was to study the association between anemia in pregnancy and chronic energy deficiency in pregnant women with malnutrition in children in Aimas District, Sorong Regency, West Papua Province.

METHODS

The study design used is a case-control study with an analytical approach. The population in the study were all children in Aimas District, specifically aged over 6 months and a

maximum of 5 years. Data collection was carried out simultaneously with Integrated Health Center (IHC) activities during November 2021. The sampling method used was total sampling. The instrument used is anthropometry to establish the diagnosis of malnutrition. Malnutrition here includes wasting and stunting. Regarding anemia and CED, the maternal and child health book was used to obtain data, such as hemoglobin levels and upper arm circumference. The variables of anemia and CED here are one unit because of limited data.

The number of controls for cases is in a 1:1 ratio. The consideration is the very large number of cases and the level of difficulty in extracting information from the two groups is the same. On this basis, in order to maximize statistical efficiency, the ratio of controls to cases is 1:1 of the total sample obtained.[15]

Data collection is carried out with the help of other health workers, such as nurses, midwives, and public health experts. In this study there are also several epidemiological measures, such as odds ratios, probabilities, and attributable risk. Attributable risk to assess how much risk can be prevented if exposure or risk factors can be eliminated.

RESULTS

The total research subjects were 1060, spread over 26 IHC. Of all research subjects, there were 174 subjects with malnutrition, which were divided into 22 with poor nutritional conditions and 152 with stunting conditions. The results of the bivariate analysis obtained are anemia and CED in pregnancy are risk factors for malnutrition in children.

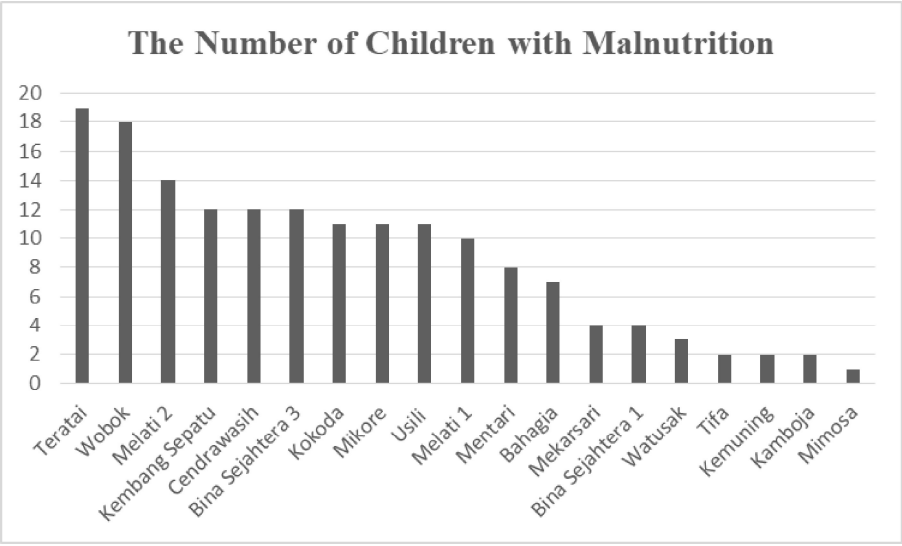

Figure 1. Number of children with malnutrition spread across 26 posyandu

Table 1. Bivariate analysis results

	Cases	Control
Risk Factor (+)	121	10
Risk Factor (-)	53	164
Total	174	174
Probability	121/174 = 0.695 = 69.5%	10/174 = 0.057 = 5.7%
1- P	0.305 = 30.5%	0.943 = 94.3%
Odds	2,27	0.06
Odds Ratio	37.84	
Attributable Risk (%)	91.7%	

DISCUSSION

In Aimas District, most of the people's livelihoods are masons and fishermen. As seen in Figure 1, the most IHC are Kokoda and Teratai. In this village, the majority of the population are indigenous Papuans. Local customs related to the occurrence of malnutrition in children.

Odds ratio result is 37.84. The interpretation is, children who have mothers with a history of maternal anemia and chronic energy deficiency during pregnancy have a 37-fold risk of experiencing malnutrition in later life, compared to those who do not. Attributable risk obtained 91.7%, which means that if the risk factors can be eliminated, 91% possibility to overcome malnutrition in children.

Through this study, it can be seen that the nutritional status of pregnant women is a serious problem. It is important for Public Health Center to address this problem. Giving blood supplement tablets is important. However, the workload of the Public Health Center will increase. Therefore, the Public Health Center can cooperate with outside parties.

The closest external party to the target is the teacher at the school. As ordinary people, health workers can train teachers in schools to carry out simple checks in screening the nutritional

status of adolescent girls. This simple examination is the Upper Arm Circumference (UAC) measurement.

CONCLUSION

Chronic energy deficit and maternal anemia are risk factors for malnutrion in Children in Aimas, Sorong Regency, West Papua Province, Indonesia.

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