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Malaria and Nutritional Status in Children Living in Endemic Areas of Kamrup Metropolitan District, Assam, India.

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Abstract: The aim of the study was to find out the status of nutritional status of children below (=<15) years between the asymptomatic and symptomatic malaria-prone village of Kamrup metropolitan District of Assam, India and to find out the association of malaria with nutritional status by measuring Body Mass Index (BMI) of children. The result was found that 49 and 55 nos. of children had normal BMI in symptomatic and asymptomatic malaria-prone villages respectively. 0-5 years had more normal BMI in both the village which may be due to breastfeeding habits and proper care. Association of malaria with nutritional status was not so clear.

Keywords: Asymptomatic, Body Mass Index (BMI), association.

1. INTRODUCTION

One of the major cause of children morbidly and mortality is due to health-related issues or disease. Malaria and malnutrition are considered as an issue among these [1] [2]. It is also always debatable about its disease effect for which it causes malnutrition leading to mortality [5] [7] [14]. Studies show acute weight loss due to *Plasmodium falciparum* [10]. There are many supportive studies available which shows a relationship between malnutrition and malaria [3] and others show no association [11]. The present study was carried out in Kamrup Metropolitan District of Assam, keeping in the view that if there any relationship between malaria-infected children and healthy children of <= 15 years. Various factors like socio-economic, demographic, gender role, health awareness is related to transmission and epidemics of malaria.

2. MATERIALS AND METHODS

2.1 Study area

Two malaria endemic villages of Kamrup Metropolitan District of Assam were considered for the study. One was Suwali Lukua village, comprising of three small villages of total populations 359. Asymptomatic malaria cases were reported by this village and were considered as study village. Another village called Hazongbari, symptomatic malaria prevalent village, of total populations 749, was considered as control village.

2.2 Study design

A total of 200 children, 100 numbers of each village was chosen for the study. Both malaria-infected and healthy children were measured their height and weight by measuring tape and Nova BGS-1231 digital weighing machine. The measurements were noted in centimeter and kilograms. Body mass index (BMI), which was considered as the measurement for nutritional status, also measured and compared according to the World Health Organization [15] (BMI of 18.5 to 25: normal, 25 to 30: overweight, over 30: obese and less than 18.5 is considered underweight). Further the age group were divided into three groups.

2.3 Data analysis

The data obtained were plotted in an excel sheet and analyzed and categorized accordingly as per WHO standards.

3. RESULT

The result was found that the control village was more normal in BMI than study village (55 & 49 nos.) and study village more undernourished and severely undernourished than control village. The boys were found as more normal BMI than the girls in both the villages. Age distribution on BMI status

was shown that 0-5 years had normal BMI in both the village. Association of malaria with BMI was not much clearer. The results were shown in Table 1, 2 and Figure 2, 3.

Table 1: BMI comparison of study and control

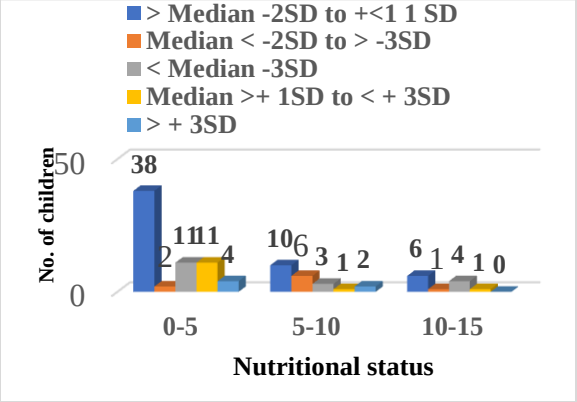
BMI Area	Nor-mal	Mod-erate under nutrition	Severe under nutrition	Overweight	Obes-ity
A	49	21	21	6	3
B	55	18	9	12	6

*A=Study village, B=Control village

Table 2: Association of BMI with Malaria

Area	With Malaria		without Malaria	
	Normal BMI	<BMI	Normal BMI	<BMI
A	53	29	6	12
B	5	6	60	29

*A=Study village, B=Control village

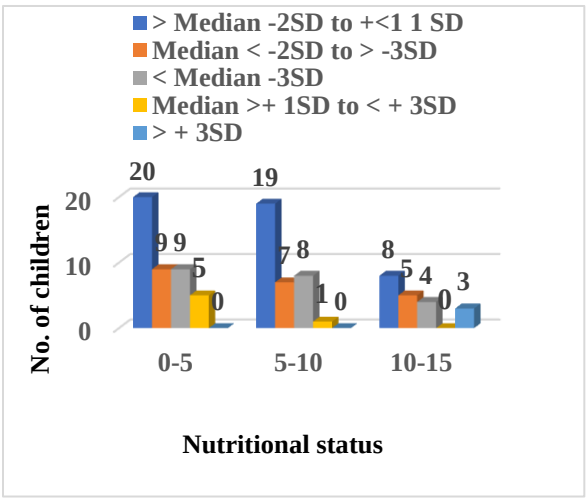


> Median -2SD to +<1 1 SD: Normal, Median < -2SD to > -3SD : Moderate undernutrition, < Median -3SD : Severe undernutrition, Median >+ 1SD to < + 3SD : Overweight, > + 3SD : Obesity

Fig. 2. Age distribution of BMI in Control village

4. DISCUSSION

The finding on the study shows that asymptomatic malaria cases of study village were greater in a number of children having malaria with normal BMI than without malaria. On the other hand, the control village was found almost equal results.



> Median -2SD to +<1 1 SD: Normal, Median < -2SD to > -3SD : Moderate undernutrition, < Median -3SD : Severe undernutrition, Median >+ 1SD to < + 3SD : Overweight, > + 3SD : Obesity

Fig. 1. Age distribution of BMI in Study village

Whereas, without malaria, control village a greater number of children had normal BMI. The study showed no clearer conclusion regarding the relationship between BMI status and malaria infection. The similar type of debatable results was reported by previous studies [4][7] [14]. Few reported as there was no association [3] [11] and other reported increased risk of malaria among stunt and underweight children [3][5][6]. According to the previous research, the nutritional status of the children played an important role in morbidity and host resistance to infection [8] [9] [12] [13]. Age distribution on BMI status showed 0-5 years had normal BMI in both the village might be the breastfeeding habits and more protective years of childhood when children were best-taken care off by the parents.

5. CONCLUSION

The study of young children's living in the malaria-endemic village(study) where asymptomatic cases reported, had a large number of malnourished children (21 moderately and 21 severely malnourished) than control village (18 moderately and 9 severely malnourished). The result was found that normal BMI with malaria-infected children had more (53) than below normal (23) in study villages. Whereas in symptomatic malaria village(control) was

found an almost equal relationship with malaria infection and BMI (5 normal and 6 below normal).

From the above result, it can be concluded that for improvement of nutritional status and to reduce malaria incidence it is suggested to take increase health awareness and to adopt preventive measures to fight against any disease. In both villages, it was found that in the group of 0-5 years had more numbers of normal BMI children (20 and 38) in study and control villages as that is the age when a child is taken care of.

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REFERENCES

[1] Black MM, Baqui AH, Zaman K, et al. Iron and zinc supplementation promote motor development and exploratory behavior among Bangladeshi infants. Am J Clin Nutr 2004; 80:903–10.

[2] Bayley N. Bayley scales of infant development, II. San Antonio, TX: Harcourt Brace & Co, 1993.

[3] Carswell F, Hughes AO, Palmer RI, Higginson J, Harland PS, Meakins RH: Nutritional status, globulin titers, and parasitic infections of two populations of Tanzanian school children. Am J Clin Nutr 1981, 34:1292-1299.

[4] Deen, J.L., Walraven, G.E., von Seidlein L: Increased risk for malaria in chronically malnourished children under 5 years of age in rural Gambia. J Trop Pediatr 2002, 48:78-83.

[5] Deribew, A., Alemseged, F., Tessema, F., Sena, L., Birhanu, Z., Zeynudin, A., Sudhakar, M., Abdo, N., Deribe, K., Biadgilign, S.(2010, May 10). Malaria and under-nutrition: a community-based study among under-five children at risk of malaria, south-west Ethiopia. *Public Library of Science (PLoS) One*, *5*, e10775. doi: 10.1371/journal.pone.0010775.

[6] Ehrhardt, S., Burchard, G.D., Mantel, C., Cramer, J.P., Kaiser, S., Kubo, M., Otchwemah, R.N., Bienzl, U., Mockenhaupt, F.P. (2006). Malaria, anemia, and malnutrition in African children-defining intervention priorities. *Journal of Infectious Diseases,194*(1), 108-114.

[7] Fillol, F., Cournil, A., Boulanger, D., Cisse, B., Sokhna, C., Targett, G., Trape, J.F., Simondon, F., Greenwood, B., Simondon, K.B. (2009) Influence of wasting and stunting at the onset of the rainy season on subsequent malaria morbidity among rural preschool children in Senegal. *American Journal of Tropical Medicine and Hygiene, 80*, 202-208.

[8] Gershwin, M.E., Beach, R.S. and Hurley, L.S. (1985). Nutrition and Immunity, *Academic Press, New York.*

[9] Keusch, G.T (1979). Nutrition as a determinant of host response to infection and the metabolic sequelae of infectious disease. *Seminar of Infectious Diseases, 2*, 265–303.

[10] Levitsky DA, Barnes RH. Nutritional and environmental interactions in the behavioraldevelopmentoftherat:longtermeffects.Science1972;176:68–73.

[11] Muller, O., Garenne, M., Kouyate, B., and Becher, H. (2003). The association between protein–energy malnutrition, malaria morbidity and all-cause mortality in West African children. *Tropical Medicine of International Health, 6* (8), 507–511.

[12] Pinstrup-Andersen, P., Burger, S., Habicht, J.P. & Peterson, K. (1993). Protein-energy malnutrition. In: Disease Control Priorities in Developing Countries. (eds DT Jamison, WH Mosley, AR Measham & JL Bobadilla), *Oxford University Press, Oxford*. 391–420.

[13] Rice, A.L., Sacco, L., Hyder, A. & Black, R.E. (2000). Malnutrition as an underlying cause of childhood deaths associated with infectious diseases in developing countries. Bulletin of the World Health Organization, *78*, 1207–1221.

[14] Snow, R.W., Byass, P.,Shenton, F.C.,Greenwood, B.M. (1991). The relationship between anthropometric measurements, and measurements of iron status and susceptibility to malaria in Gambian children. *Transactions of Royal Society of Tropical Medicine and Hygiene, 85*:584-589.

[15] World Health Organization (WHO) (2010).