Serum Vitamin A and Zinc levels in School Children with and without Malaria

Parasitaemia in Kisii District, Kenya.

Irene Mogiti Makori

A thesis submitted in partial fulfillment for the Degree of Master of Science in Public

Health, in the Jomo Kenyatta University of Agriculture and Technology.

2010

ABSTRACT

Zinc and vitamin A supplementation in children has been associated with reduction in the incidence and severity of diarrheal diseases, acute respiratory infections and malaria. However, studies have shown little evidence of zinc supplementation on reduction of morbidity and malaria. The aim of this study was to identify the possible association between serum retinol and zinc levels and susceptibility to malaria infection in school children. This was a case-control study. A finger prick was done to obtain blood from school children aged between 6 – 10 years to screen for malaria. In total, 55 children with malaria parasitaemia and a similar number without were enrolled in the study. Venous blood was drawn from the children and analyzed for serum levels of zinc retinol and haemoglobin. Atomic Absorption Spectrometry, and High performance liquid chromatography [HPLC] were used in determination of serum zinc and retinol respectively. Anthropometric measurements and clinical signs of malaria were taken. A questionnaire on demographic data, dietary practices, use of anti-vector measures and relevant medical history was administered on the children's parents/guardians.

Data was cleaned and entered into a database using SPSS version 11.5. Epi Info v 6.04 was used to classify anthropometric indices. Descriptive statistics such as mean, standard deviation, median and range were used to indicate the average value and spread of these values. Independent T-test was used to test for mean comparison on the continuous variables between malaria positive and malaria negative children. Pearson's correlation coefficient was used to measure relationships between two continuous variables. Cross tabulations between all categorical variables and malaria status was performed to uncover

the distribution patterns. Pearson chi-square test was used to test for association between malaria status and individual categorical variables.

Children with and those without malaria had similar serum zinc (P=0.762) and retinol (P=0.402) values although those with malaria had slightly higher levels of both serum zinc and retinol. However, children without malaria had higher mean blood count (304.8) than those with malaria (257.6), significant at P=0.001. Although not statistically significant, children without malaria had higher mean iron levels than children with malaria. The study confirms other findings that the link between serum zinc and retinol and malaria is not clear. Interestingly, children without malaria had significantly higher frequencies of feeding per week compared to those with malaria. More in depth investigations are needed to conclusively establish the relationship between serum zinc and retinol levels and malaria parasitaemia.