PA-311 VITAMIN D STATUS AND THE RISK OF MALARIA AMONG UNDER-FIVE CHILDREN IN AFRICA

Mary Njoroge. *London School of Hygiene and Tropical Medicine, UK*

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Background Vitamin D deficiency (VDD) and malaria are conditions of public health importance whose burden is still rising among children globally and in sub-Saharan Africa (SSA). Animal studies have found evidence of the association between VDD and various outcomes, including malaria. However, few observational studies quantifying the effect of VDD or vitamin D insufficiency (VDI) on malaria in humans exist. This study aimed to examine the effect of vitamin D on malaria risk among children in SSA.

Methods This analysis utilised data from a prospective birth cohort in Entebbe, Uganda and a community-based cohort in Kilifi, Kenya. Univariate and multivariable Poisson regression with robust standard errors, logistic, and linear regression models were used to estimate the effect of vitamin D on malaria (incidence/risk/antibodies), respectively.

Results Of the 2493 children analysed, 42.0% had VDD/VDI (25(OH)D levels<75nmol/L). After adjusting for age, sex, iron deficiency (ID) and country, there was some evidence of an association between VDD/VDI and malaria incidence at 6 months following vitamin D measurement (ARR:1.18;95% CI:0.98–1.42;p=0.072). Malaria risk and incidence results were similar. After adjusting for age, sex, ID, inflammation, and cohort, there was strong evidence of an association between VDD/VDI and higher log anti-AMA-1 (Adjusted β:0.25;95%CI:0.08,0.43;p-value=0.004). Some differences in the relationship between VDD/VDI and malaria antibody levels were seen between cohorts.

Conclusion Low vitamin D levels are associated with increased malaria incidence and *P.falciparum* antibodies. The results of this analysis were consistent with the evidence from animal studies and did not support the clues found in some existing observational studies. These results suggest that VDD/VDI may play a role in advancing malaria infection, but the malaria antibody results could be due to reverse causality. Further research is warranted to confirm the malaria incidence/risk results and address the direction of causality between VDD/VDI and malaria antibodies using Mendelian randomisation.

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PA-313 FOLIC ACID, VITAMIN B12 AND HOMOCYSTEINE PROFILES IN YOUNG NON-PREGNANT AND PREGNANT WOMEN LIVING IN A MALARIA ENDEMIC AREA: A SECONDARY ANALYSIS OF TRIAL DATA

[1]Salou Diallo*, [2]Merel Schrooten, [2]Norbert van Dijk, [3]Stephen A Robert, [1]Karim Derra, [1]Adélaide Compaoré, [2]Petra F Mens, [2]Henk Schallig, [4]Bernard Brabin, [1]Halidou Tinto. *[1]Clinical Research Unit Of Nanoro, Burkina Faso; [2]Academic Medical Centre at the University of Amsterdam, Department of Medical Microbiology – Experimental Parasitology Unit, The Netherlands; [3]Centre for Biostatistics, Division of Population Health, Health Services Research and Primary Care, Faculty of Biology, Medicine and Health, University of Manchester, Manchester Academic Health Science Centre (MAHSC), UK; [4]Clinical Division, Liverpool School of Tropical Medicine, UK*

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Background The safety of iron and folate supplementation in young women living in malarious areas, before and during their first pregnancy, is uncertain as both nutrients can alter malaria risk.

Methods Folate biomarkers were assayed by ELISA in sera of 541 never pregnant women (mostly adolescent) enrolled in a periconceptional controlled trial of weekly iron/folic acid supplementation in rural Burkina Faso (Funded by AREF-EDCTP). Of these 315 become pregnant during the trial, with 226 remaining non-pregnant.

Results For paired samples mean homocysteine and folic acid concentrations increased between both baseline and early pregnancy (p<0.0001), and baseline and late pregnancy (p<0.0001), although B12 concentration only increased by late pregnancy. In those remaining non-pregnant with paired samples (n=133), homocysteine and folic acid decreased between baseline and end of study (respectively 59.0±24.0 versus 56.5±25.8, (p=0.001; and 39.9±8.3 vs 33.7±7.00 nmol/L, p=0.0001, [(t test]). Vitamin B12 concentrations did not change between enrolment and end assessment (189.32 ±32.83 vs 189.45±32.95 pmol/L, p=0.97, [t test]). Malaria parasitaemia prevalence was 54.0% in pregnant women in early pregnancy and 41.8% in women remaining non-pregnant women at end assessment. In pregnant women mean B12 concentration was lower in those with parasitaemia (170.9± 25.4 vs 181.1± 25.8 pmol/L, p<0.01). In non-pregnant women these values were 34.0 ±6.4 vs 33.2±7.0 nmol/L (p=0.56) for folic acid; 193.5±31.8 vs 189.9±30.9 pmol/L (p= 0.57) for B12, and 53.6±24.4 vs 58.1±28.0 µmol/L, p=0.40, [t tests]) for homocysteine. In pregnant or non-pregnant women folic acid and homocysteine concentrations did not differ by malaria status.

Conclusion In conclusion, concentrations of folate biomarkers increase from early in pregnancy, with a negative association of malaria parasitaemia with vitamin B12 concentration. In non-pregnant women folic acid and homocysteine decrease at end of study with no association of malaria.

PA-318 COMPARATIVE ANALYSIS OF MULTIPLEX IMMUNOASSAYS FOR HOST BIOMARKER PROFILING IN TUBERCULOSIS DIAGNOSIS AND TB TREATMENT RESPONSE

Candice Irene Snyders, Marika Flinn, Leanie Kleynhans, Gerhard Walzl, Novel Chegou. *Stellenbosch University, South Africa*

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Background Proteins such as cytokines, chemokines and growth factors play critical roles in biological processes. These act as disease biomarkers in the study of various infectious diseases. Dysfunction or dysregulation of these biomarkers may cause a variety of pathophysiological conditions. Consequently, biomarker profiling and related technologies are essential for biological studies, disease diagnosis, monitoring of treatment response and drug discovery. Many multiplexing platforms are available for the detection of these biomarkers. There is limited independently published information about the reliability of most of the platforms available in the market. The objectives of this study were to assess the abilities of the Luminex, Meso Scale Discovery (MSD) and the Curiox Drop-Array system in the detection of biomarkers in spiked sera.

Methods We assessed the abilities of three multiplex technologies; Luminex, MSD and the Curiox Drop-Array system in the detection of five cytokines, interleukin (IL)-2, IL-6, IL-10,