

Author: Frederick Grant

Co Author: Alysse Kowalski (Emory University), Haile Selassie Okuku, Rose Wanjala (International Potato Center), Donald Cole (University of Toronto), Carol Levin (University of Washington), Jan Low (International Potato Center), Amy Webb Girard (Emory University)

Topic: The first 1000 days, infant feeding, and early childhood development

Title: Correcting for inflammation modifies estimates of vitamin A and iron deficiencies among pregnant women in western Kenya

Presentation Type: Oral

Objective: Assessment of vitamin A (VA) and iron statuses in high infection settings is influenced by effects of inflammation on VA and iron deficiency (ID) indicators especially among pregnant women. We compared approaches that adjust for this influence.

Method: Blood was obtained from 504 pregnant women (10-26 weeks gestation). Indicators of VA status [(retinol binding protein (RBP)], iron status [(hemoglobin (Hb), ferritin, transferrin receptor (TfR), and TfR/ferritin index)] and subclinical inflammation [(acute phase proteins (APP), C-reactive protein (CRP) and α -1-acid glycoprotein (AGP)] were determined. Subclinical inflammation was defined as CRP >5mg/L and/or AGP >1g/L. Correction factors (CF) were estimated as ratios of geometric means of VA and iron indicators to the reference group of those for each inflammation group. Corrected values of VA and iron indicators within inflammation groups were obtained by multiplying values by their respective group CF.

Results: CRP correlated with RBP ($r=-0.20$; $P<0.001$), ferritin ($r=0.20$; $P<0.001$), and TfR/ferritin index ($r=-0.19$; $P<0.001$). AGP correlated with CRP ($r=0.44$; $P<0.001$), ferritin ($r=0.29$; $P<0.001$), and TfR/ferritin index ($r=-0.22$; $P<0.001$). Use of CF to adjust for inflammation decreased the prevalence of VA based on RBP $<1.17\mu\text{mol/L}$ by 18% and increased iron deficiency (ID) based on ferritin $<15\mu\text{g/L}$ by 14%. Applying the CF unveiled the expected relationship between VA (RBP) and iron (ferritin) status ($r=0.10$; $P=0.029$, with adjustment vs $r=0.03$; $P=0.48$ without).

Conclusion: The use of CF to adjust for inflammation appears indicated among pregnant women; however, additional research is needed to confirm if this approach improves the accuracy of assessment of both VA and ID.