ASSOCIATION BETWEEN IRON STATUS AND WHITE BLOOD CELL COUNTS IN AFRICAN SCHOOLCHILDREN OF THE NORTH-WEST PROVINCE, SOUTH AFRICA

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Abstract

Iron deficiency with or without anemia is associated with increased susceptibility to infection owing to impaired immune function; this study aimed to examine the associations between markers of iron status and white blood cell counts in African schoolchildren. This cross-sectional study is part of the larger BeForMi study done in the North-West province of South Africa. A total of 556 African schoolchildren (aged 7–10 years) were recruited from the three schools participating in the BeForMi multiple micronutrient intervention study. Demographic information of the children was obtained from their parents/caregivers/guardians in the language of choice using validated questionnaires. Anthropometric indices (weight and height), iron status parameters, hematological parameters (hemoglobin (Hb), red blood cell count (RBC), total and differential white blood cell counts) were measured using standard procedures. No significant gender differences were observed in most of the iron markers and hematological parameters except in C-reactive protein (CRP) ($p = 0.004$) and eosinophils ($p = 0.042$) which were higher in boys while RBC ($p = 0.018$) and Hb ($p = 0.023$) levels were higher in girls. No relationships were observed between the different iron markers and differential white blood cell counts. A positive correlation was observed between serum ferritin (SF) and CRP in girls only ($r = 0.336$, $p < 0.01$), and a positive correlation between SF and mean cell volume (MCV) in boys only ($r = 0.197$, $p < 0.01$). In both genders, no correlations were observed between the different iron markers and the differential white blood cell counts. The study revealed no associations between iron status and differential white blood cell counts in children that participated in the BeForMi study calling for more studies to be done in the area of the significance of iron supplementation in healthy children.

Keywords: Iron markers; Hematological parameters; Differential white blood cell counts; African schoolchildren; BeForMi Study