

Anemia Burden, Types and Associated Risk Factors among Kenyan Human Immunodeficiency Virus-1 and Mycobacterium Tuberculosis Co-infected Injection Substance Users

BACKGROUND: Although injection substance users and individuals co-infected with Human Immunodeficiency Virus-1 and Mycobacterium tuberculosis suffer marked hematologic derangements, the rates, levels, morphologic types and associated risk factors of anemia among Human immunodeficiency virus and Mycobacterium tuberculosis co-infected injection substance users has not been reported in Kenya. **METHODS:** This cross-sectional study determined anemia rates, levels and morphologic types. Anemia was associated with clinical markers of disease-underweight, immunosuppression and viral load. Complete blood count, CD4 T-cell enumeration and viral load were determined via standard laboratory methods. **RESULTS:** All injection substance users had higher rates of anaemia (HIV+TB+ ISUs, 79.3%; HIV-TB+ISUs, 70.0%; HIV+TB-ISUs, 56.6% and HIV-TB-ISUs, 56.2%) relative to non-ISUs (16.6%; $P < 0.05$). A significant proportion of HIV+TB+ISUs (47.8%) developed severe anemia than other clinical groups. The commonest morphologic type of anemia in HIV+TB+ISUs was microcytic hypochromic (43.5%) followed by normocytic hypochromic (17.4%) relative to the other clinical groups. HIV+TB+ ISUs with CD4 T-cells $< 200/\mu\text{L}$ (OR: 2.94, 95% CI: 1.41-6.13, $P = 0.004$) and CD4 T-cells of 200-349/ μL (OR: 3.24, 95% CI: 1.66-6.31, $P = 0.001$) associated with higher odds of developing anemia. **CONCLUSION:** This study revealed that severe anemia and microcytic hypochromic anemia are the most common erythrocytic sequelae among Human Immunodeficiency Virus-1 and Mycobacterium tuberculosis co-infected ISUs. Those with CD4 T-cells $< 350/\mu\text{L}$ are utmost expected to develop anemia.

Authors

Collins Odiwuor

Nathan Shaviya

Valentine Budambula

Tom Were