

Cardiometabolic Risks among African Pregnant Women in the Era of Antiretroviral Therapy: A Focus on Perinatal Outcomes

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Background: Antiretroviral therapy (ART) regimens have been shown to cause metabolic changes in people living with HIV, potentially predisposing them to cardiometabolic disease (CVMD). However, such evidence is less established in pregnant women living with HIV (pWLWH) on ART in countries such as South Africa with the highest antenatal HIV prevalence, the largest ART program worldwide, and a successful Prevention of Mother to Child Transmissions (PMTCT) programme. Pregnancy-induced cardiometabolic risks (CMR) can persist in the postpartum period, resolve, and recur in subsequent pregnancies, or emerge as newly diagnosed chronic diseases of ageing, and further predispose majority of HIV-exposed but uninfected (HEU) offspring to poorer physical growth and health compared to offspring born HIV-unexposed (HU).

Aim: To investigate CMR and perinatal outcomes in pWLWH on ART compared to HIV-negative mothers and further monitor their offspring's growth patterns in a life course approach.

Methods: A prospective non-communicable diseases and antiretroviral mother-child (NCDART-MC) study will be conducted in a cohort of pWLWH on ART and HIV-negative mother, and their offspring in primary health facilities in South Africa, Ghana, and Namibia. Data will be collected on sociodemographic, medical/health, obstetric, and nutritional status of all pregnant women using validated questionnaires. CMR (hypertensive, hyperglycemic and weight disorders), related markers (lipids, inflammatory, anthropometric, and glycaemic indices) and offspring's data (age, sex, anthropometry and feeding practices) will be assessed using standard procedures at various time points from the third trimester throughout the first two years of life. An IBM SPSS version 28 will be used to analyse data.

Discussion: The NCDART-MC study could provide scientific evidence on the magnitude of CMR and perinatal outcomes in pWLWH on ART to partly inform integrated care guidelines for the coexisting CVMD and HIV. Imperatively, monitoring of HEU infant growth outcomes is an important component in the evaluation of the effectiveness of the PMTCT programme, and further informs efforts to preserve the health of these vulnerable children.

Advocacy: Offspring of pregnant women living with HIV on ART have a risk of dual exposure to HIV and ART, amidst the highest antenatal HIV prevalence reported in the country. However, these offspring have not been studied robustly in comparison with offspring born of HIV negative mothers regarding growth and development. HEU offspring may experience suboptimal growth and development during infancy and throughout to school-going age, subsequently impacting on their educational achievement. Therefore, prospective future studies should focus on growth

trajectories of HEU infants born from pregnant women living with HIV who are either on ART or ART naïve in comparison to HU counterparts, throughout the life course especially in the era of the dolutegravir ART regimen.

Keywords: HIV; ART; pregnant women; cardiometabolic risks; perinatal outcomes; South Africa; Ghana; Namibia