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Longitudinal Neurodevelopmental Outcomes in HIV-Exposed Uninfected Children Born to Mothers on Dolutegravir-Based Antiretroviral Therapy in Botswana: A Policy Analysis for the African Context

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| Abstract

The widespread adoption of dolutegravir-based antiretroviral therapy for pregnant women living with HIV in Africa has enhanced maternal health and minimised vertical transmission. Initial concerns regarding potential neurodevelopmental risks for HIV-exposed uninfected children necessitate a policy-focused review of longitudinal evidence to guide national programme guidelines. This policy analysis aims to critically appraise longitudinal evidence on neurodevelopmental outcomes in HIV-exposed uninfected children born to mothers on dolutegravir-based ART in Botswana. Its objective is to synthesise findings relevant to antenatal care policy and to formulate evidence-based recommendations for national HIV programmes in African settings. A structured policy analysis was undertaken, involving a systematic review and synthesis of available longitudinal cohort studies and surveillance data from Botswana. The analysis applied a policy evaluation framework to assess evidence quality, clinical practice implications, and alignment with public health objectives for maternal and child health. Synthesised longitudinal data indicate no statistically significant increase in major neurodevelopmental impairments associated with in-utero dolutegravir exposure compared to other antiretroviral regimens. Evidence underscores that maternal health and viral suppression are critical for optimal child development, outcomes which dolutegravir effectively supports. Ongoing surveillance for subtle or

later-onset neurodevelopmental outcomes remains justified. Current longitudinal evidence from Botswana supports the continued and preferential use of dolutegravir-based ART in pregnancy within national HIV programmes. The substantial benefits for maternal health and prevention of mother-to-child transmission outweigh the unconfirmed neurodevelopmental risks, which appear minimal. National HIV programmes should maintain dolutegravir as first-line therapy for pregnant women. Policy should mandate strengthened, long-term neurodevelopmental surveillance integrated into routine child health services. dolutegravir, HIV-exposed uninfected, neurodevelopment, policy analysis, antiretroviral therapy, pregnancy, Botswana, Africa. This analysis provides a consolidated, policy-focused review of longitudinal neurodevelopmental evidence to inform national HIV programme guidelines and clinical practice for pregnant women in African settings.
