



A Scoping Review of Neurodevelopmental Trajectories in HIV- Exposed Uninfected Children Born to Mothers on Dolutegravir-Based Antiretroviral Therapy in Botswana

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Abstract

The widespread adoption of dolutegravir-based antiretroviral therapy (ART) for pregnant and breastfeeding women living with HIV has improved maternal health and reduced vertical transmission. Concerns remain, however, regarding potential neurodevelopmental effects on HIV-exposed uninfected (HEU) children. A synthesis of evidence on their long-term neurodevelopmental trajectories is required. This scoping review aimed to map and synthesise existing literature on longitudinal neurodevelopmental outcomes in HEU children born to mothers receiving dolutegravir-based ART in Botswana. Its objectives were to identify key assessment domains, methodological approaches, and gaps in the evidence base. A scoping review was conducted following Joanna Briggs Institute methodology. Multiple electronic databases and grey literature sources were searched systematically. Studies reporting longitudinal neurodevelopmental data on HEU children exposed to dolutegravir in utero in Botswana were included. Data were charted and analysed thematically. The search identified a limited but growing body of literature. Preliminary findings indicate a predominant focus on early childhood outcomes, assessing cognitive, motor, and language domains. A recurring theme is the comparison of developmental trajectories between HEU children and their HIV-unexposed peers. Some evidence suggests a need for enhanced developmental monitoring in the HEU cohort. Research on the neurodevelopment of HEU children exposed to dolutegravir in Botswana is nascent. While initial longitudinal data are emerging, significant gaps persist in understanding trajectories into middle childhood and adolescence. Future research should prioritise standardised, long-term cohort studies with extended follow-up. Studies should incorporate contextual and social determinants of development. Programmatically, findings support integrating routine neurodevelopmental screening into paediatric HIV exposure care pathways. HIV-exposed uninfected; dolutegravir; neurodevelopment; longitudinal studies; Botswana; antiretroviral therapy. This review provides a structured overview of the current evidence landscape, clarifying known outcomes and critical knowledge gaps to inform future research and clinical monitoring programmes for this paediatric population.

Keywords: *HIV-exposed uninfected children, dolutegravir, neurodevelopment, Botswana, longitudinal studies, antiretroviral therapy, sub-Saharan Africa*

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