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SA child living with HIV maintains remission without ARVs since 2008

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Dr Avy Violari, head of pediatric research at the Perinatal HIV Research Unit (PHRU) in the Faculty of Health Sciences, University of the Witwatersrand, reported the case on 25 July 2017 at the 9th International AIDS Society (IAS) Conference on HIV Science in Paris, France.

Violari co-led the Children with HIV Early Antiretroviral Therapy (CHER) trial, in which the case emerged, with Dr Mark Cotton, head of the Division of Pediatric Infectious Diseases and director of the Family Infectious Diseases Clinical Research Unit at the University of Stellenbosch.

"To our knowledge, this is the first reported case of sustained control of HIV in a child enrolled in a randomized trial of ART [antiretroviral treatment] interruption following treatment early in infancy," says Violari.

Before starting ART, the child had very high viral loads, but at about nine weeks old, the ART suppressed the virus to undetectable levels. Investigators halted treatment after 40 weeks as per the trial randomization. They closely monitored immunity and the child has remained in good health during years of follow-up examinations.

Although it was not standard practice in South Africa to monitor viral load in people who were not on ART, recent analyses of stored blood samples taken during follow-up visits showed that the child has maintained undetectable levels of HIV-1 since treatment interruption.

Professor Caroline Tiemessen, the senior author of this case and Research Professor in Virology in the School of Pathology at Wits University, led the key laboratory investigations.

"We believe there may have been other factors in addition to early ART that contributed to HIV remission in this child. By further studying the child, we may expand our understanding of how the immune system controls HIV-1 replication," says Tiemessen, who is also the NRF/DST Research Chair in HIV Vaccine translational research and head of cell biology at the Centre of HIV and STIs of the National Institute of Communicable Diseases in Johannesburg.

The South African child was diagnosed as HIV-1 positive during 2007 at 32 days old and was then enrolled on the CHER clinical trial, funded by the National Institute of Allergy and Infectious Diseases (NIAID).

The NIAID provided funding for the CHER trial as part of a Comprehensive International Program for Research on AIDS-South Africa grant.

HIV-1 infected infants in the trial were assigned at random to receive one of three treatments - either deferred ART or early limited ART for 40 or 96 weeks. The South African child was assigned to receive early ART (AZT, 3TC, Lopinavir/ritonavir) for 40 weeks.

When this child was nine-and-a-half years old, investigators conducted laboratory and clinical studies to assess the child's immune health and the presence of HIV-1. They detected a viral reservoir that had integrated into a tiny proportion of immune cells but otherwise found no evidence of HIV-1 infection.

The child had a healthy level of key immune cells, a viral load that was undetectable by the routine laboratory diagnostic assays, and no

symptoms of HIV-1 infection. The researchers detected a trace of immune system response to the virus but found no replication competent HIV-1.

Researchers confirmed that the child does not have genetic characteristics previously associated with spontaneous control of HIV-1 in adults, suggesting that the 40 weeks of ART provided during infancy may have been key to achieving HIV-1 remission in this case.

Dr Anthony S. Fauci, NIAID director, says, "Further study is needed to learn how to induce long-term HIV remission in infected babies. However, this new case strengthens our hope that by treating HIV-infected children for a brief period beginning in infancy, we may be able to spare them the burden of lifelong therapy and the health consequences of long term immune activation typically associated with HIV-1 disease."

Worldwide, this case appears to be the third reported instance of sustained HIV-1 remission in a child after early, limited ART. The first case, the "Mississippi Baby," born with HIV-1 in 2010, received ART beginning 30 hours after birth, stopped therapy around 18 months of age, and controlled the virus without drugs for 27 months before it reappeared in the blood.

The second case, reported in 2015, described a French child who was born with HIV-1 in 1996, started ART three months after birth, stopped treatment sometime between five-and-a-half and seven years, and continued to control the virus without drugs more than 11 years later.

More information: A. Violari, M. Cotton, L. Kuhn, D. Schramm, M. Paximadis, S. Loubser, S. Shalekoff, B. Da Costa Dias, K. Otwombe, A. Liberty, J. McIntyre, A. Babiker, D. Gibb and C. Tiemessen. Viral and host characteristics of a child with perinatal HIV-1 following a

prolonged period after ART cessation in the CHER trial. 9th IAS Conference on HIV Science, Paris, France.

Provided by Wits University