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Children with long-term nonprogressors of HIV

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Description

When patients have HIV infection, it is best to describe their disease course along a continuum from HIV quick progressors to HIV Long-Term Nonprogressors (LTNPs). Rapid progressors are a subset of these people who develop AIDS within a short period of time, frequently under five years. Long-term nonprogressors, on the other hand, account for 15-20% of HIV-positive patients and are individuals who experience the onset of AIDS many years after contracting the virus, frequently after the 10-year mark. Long-Term Nonprogressors (LTNPs) are a subset of long-term nonprogressors, which are people with HIV who control their infection and maintain undetectable viral levels for protracted periods of time without antiretroviral medication.

We discovered a wealth of information during our literature search about HIV LTNPs in the adult community, but there was very little information accessible about LTNPs in the paediatric population. It's crucial to distinguish between paediatric slow progressors and paediatric LTNPs because the latter term refers to a group of paediatric HIV-1-infected people who share the same route, duration, and level of care, meaning that their disease progresses to the point where antiretroviral therapy will be necessary at some point in their lives. We provide a case of a kid HIV LTNP who was born infected but never received ART and had undetectable viral levels. The term "Paediatric Long-Term Nonprogressors" (LTNPs) refers to HIV-1 infected individuals who, despite not receiving antiretroviral therapy (ART), retain a lowered viral load, which can be either undetectable (HIV RNA 20 to 75 copies/mL) or low-detectable (usually HIV RNA 200 copies/mL). Since some patients are still virologically suppressed while others go on to develop AIDS, it is unclear what clinical significance the LTNP categorization has. In spite of not getting ART, LTNPs typically maintain a specific viral load. These patients, unlike those who have experienced a "functional" cure, were previously known to have detectable HIV-1 RNA viral loads, comparable to our index case of 20,000 copies/mL of plasma, and they spontaneously suppressed their viral loads and maintained a stable CD4 count without the help of Antiretroviral Therapy (ART). Importantly, patients with a "functional" cure would test HIV-negative at some point during their treatment, in contrast to LTNPs who will always have a positive result. After contracting HIV, the virus penetrates human cells naturally and attaches to proteins on those cells. Testing for HIV tropism reveals the kind of protein that HIV binds to. The majority of HIV infections are brought on by the CCR5-using virus; but, as HIV reproduces, it may transform from a CCR5-using virus to a CXCR4-using virus. These proteins are CCR5 and CXCR4. It may be because of mutations or deletions in these proteins that an HIV-infected person

rarely develops AIDS. Our index patient had an HIV-1 strain that was CCR5-tropic. Numerous etiologies have been researched, enabling long-term nonprogressors to continue living normally in the absence of ART. These etiologies are made up of numerous mitochondrial DNA types, gene and receptor mutations, and various Human Leukocyte Antigen (HLA) types, notably *HLA-B27* or *HLA-B57*. Children who contract HIV perinatally may pick up their moms' genes and HLA. However, as several HIV-1 subtypes have been found to differ in transcriptional regulation, the viruses themselves may also be extremely distinct. HLA antigen testing for *HLA-B27* was positive for our index patient, whose mother passed away as a result of opportunistic infection aggravating her severe AIDS; nevertheless, no deletion or mutation was noted.

One query is whether her real father had HIV as well. And if that's the case, it's important to consider the potential that this patient might have a mutant *HLA B27* gene. Testing for this was not accessible, therefore it would remain a mystery because her real father was not involved in her care and his precise presence was unknown.

Conclusion

Despite the rarity of LTNPs in children, this youngster may be one because of her intermittent viremia. She has continued to show signs of infection through yearly positive ELISA and western blot testing. This case serves as an example of an adolescent LTNP, according to the viral fitness investigations that were conducted.