

Memory Functioning in HIV Positive Adolescents Receiving Anti-Retroviral Treatment.



Shona Fraser (308663)

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Supervisor: Kate Cockcroft

University of Witwatersrand

Abstract

In 2007 it was reported that an estimated 33 million people worldwide were living with the Human Immunodeficiency Virus (HIV). Of this, 35% (approximately 11.5 million) live in South Africa, most of whom were infected with HIV by mother to child transmission. Due to government legislation, until 2004, South Africans had limited access to Antiretroviral (ARV) treatment at and after birth. As a consequence, treatment of HIV was, at this time, only in government facilities, initiated after the clinical presentation of immune deficiency. This study compared the memory functioning of low socio-economic seropositive adolescents that were on a managed anti-retroviral programme to that of a contrast group that were HIV negative. The groups were matched for age, gender, demographics and educational level. The relative impact of variables such as duration of ARV treatment, drug regimen, WHO stage at diagnosis and CD4⁺ count were all considered.

Performance on a comprehensive neuropsychological battery was compared between the HIV positive group and their typically developing counterparts both in terms of memory functions as well as other cognitive processes that may have an effect on memory. The HIV positive group performed significantly below their HIV negative peers in processing speed, holistic processing, and spatial processing as well as specific visual functions such as visual constructional skills, visual recall ability, disruptions in both storage and retrieval of visuospatial information, and visual spatial working memory. No significant differences were found between the groups on tasks measuring verbal memory and verbal learning ability indicating that the neurocognitive profile of clade C HIV has a different presentation from the other clades.

The findings suggest that the preferential effect HIV has on the frontostriatal circuits in the brain impacts memory processes due to the destructive impact of the virus on the myelination of these circuits. As a result of the higher degree of white matter tracts in the right hemisphere, holistic and integrative processing is impaired and visuospatial functions are affected whereas verbal processes are largely spared. The resulting neurocognitive profile is similar to that of nonverbal learning disorders and may benefit from similarly constructed interventions such as placing more emphasis on verbal learning strategies and limiting dependence on visual information for HIV positive pupils.