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Working memory profiles of children with the Human Immunodeficiency Virus (HIV): A comparison with controls

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Abstract

With 10% of the population being infected with Human Immunodeficiency Virus (HIV), South Africa has the highest number of infections in the world (StatsSA, 2013). HIV results in cognitive and motor deficits in children as the severe compromise of the immune system leads to neurodevelopmental dysfunction peri-natally (Ruel, Boivin, Boal, Bangirana, Charlebois, & Havlir, 2011). Neurocognitive deficits affect overall general intellectual abilities and include difficulties with attention and speed of information processing, verbal language, executive –abstraction, complex-perceptual motor function, memory and motor and sensory function (Dawes & Grant, 2007). Developmentally, it is evident that working memory provides a crucial interface between perception, attention, memory and action (Baddeley, 1996; Baddeley 2003). Therefore the purpose of the study was to investigate the working memory profiles of both an HIV positive children and a control sample, on cognitive tasks (Automated Working Memory Assessment), general intellect tasks (Raven's Colored Progressive Matrices) and language competence tasks (Sentence Repetition Test). The current study compared 26 HIV positive children (mean age = 6.58 years) to 26 matched controls (mean age = 6.73 years).

It was found that both non-verbal IQ and language proficiency were correlated to HIV status and thus were used as covariates in the study. MANCOVA's were conducted on the data and produced findings that showed that there were only significant differences in visuo-spatial short-term memory between the two groups. Furthermore, it was also found that there were significant differences between the groups on nonverbal IQ and language proficiency. Therefore, the results showed that HIV may have an overall effect on non-verbal ability and language proficiency and a few aspects of working memory such as visuo-spatial short-term memory. Together with future studies focused on larger sample sizes and children who are not currently on HAART, early developmental interventions can be formulated to assist South African HIV-infected children so that the neurocognitive effects are lessened and their overall lifestyle is improved.