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**Neurodevelopment and Growth of Institutionalised
Children with Vertically Transmitted Human
Immunodeficiency Virus**

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Chapter 1

Introduction

The human immunodeficiency virus / acquired immunodeficiency disease syndrome (HIV/AIDS) is affecting populations world wide, however, in Sub-Saharan Africa the virus itself and the consequences thereof are affecting many countries, communities, families and children in this area. Developed countries are able to control the disease and stabilise the infection rate in adults and children through preventative and active treatment. In these countries, HIV/AIDS is considered to be a chronic condition where infections have been limited and life expectancy has been increased. This is unlike the situation in the countries in Sub-Saharan Africa, where the rate of infection in adults and children is increasing because of social and economic factors and limited access to antiretroviral therapy. Here, HIV/AIDS is still an acute, fatal disease (Laufer and Scott 2000). Sub-Saharan Africa has the world's highest prevalence of HIV infected people, both adults and children. Of the 38 million infected people worldwide, 29 million are in Sub-Saharan Africa. This accounts for 76% of the HIV infected people (UNAIDS 2004).

In addition to the HIV/AIDS epidemic, Sub-Saharan Africa has a high incidence of poverty, malnutrition and other life threatening diseases as well as limited basic resources; these all compound the HIV/AIDS epidemic (Foster and Williamson 2000). Nathan et al. (2003) stated that the accelerated progression of HIV/AIDS in Sub-Saharan Africa may be a reflection of the limited availability of shelter, adequate nutrition, clean water, access to medical care and the

prevalence of poverty and exposure to other infections like malaria and tuberculosis.

The southern regions of Sub-Saharan Africa have the highest incidence of HIV/AIDS. Many of these countries border on South Africa; namely Botswana, Lesotho, Mozambique, Swaziland and Zimbabwe. Botswana has the highest percentage of its population infected with HIV, and South Africa has the largest number of HIV infections in the world (UNAIDS 2004). South Africa has a total population of 44.8 million of which more than 5 million people are infected with HIV/AIDS (Office of the United States Global AIDS coordinator 2004). Untreated HIV/AIDS has long term consequences for those infected, which, over time, results in morbidity and mortality. In adults, mortality usually occurs in their second and third decade of life and this leaves their children as orphans (UNAIDS 2004). Orphaned children are one of the tragic long-term consequences of the disease and double orphans are classified as a distinctive and important characteristic of the HIV/AIDS epidemic. These orphaned children have to continue to survive in deprived living conditions, and now, without the care and nurturing of their family (Foster and Williamson 2000). These children are in need of a stable and consistent environment that provides love and care as well as medical and social intervention (American Academy of Pediatrics 1999).

Internationally there is a preference to support orphaned children within their communities rather than to have them placed in institutions (Foster 1997, International Save the Child 2004). In South Africa, extended families assume

responsibility for 90% of orphaned children (UNICEF 2003). Only a small percentage of these orphaned children are accommodated in institutions but there are no reliable statistics available in this regard. According to some researchers, there are some benefits to institutionalisation. They mention that institutionalisation does not, in itself, have a negative influence on the growth and development of children (Munoz-Hoyos et al. 2001, Nathan et al. 2003)

Not only does HIV/AIDS result in orphans, but the incidence of vertically infected children continues to increase. Since the human immunodeficiency virus is both lymphotropic and neurotrophic, it makes HIV infected children vulnerable to opportunistic infections as well as neurological involvement. The neurological involvement can result in developmental delays and encephalopathy, as shown in numerous studies (Blanchette et al. 2002, Msellati et al. 1993, Nozyce et al. 1994). A study done on South African infants, under 12 months of age, confirmed these findings (Potterton and Eales 2001). Neurodevelopmental delays occur early in the disease process and the earlier the child is infected the poorer the neurological functioning (Smith et al. 2000). HIV can also affect a child's growth (i.e. anthropometric measurements), namely height-for-age and weight-for-age (Moye et al. 1996). They may also have a reduced head circumference measurement, which is related to the progression of the neurological involvement (Macmillan et al. 2001).

South Africa has a high prevalence of both HIV infected children and orphans. Like many other countries in Sub-Saharan Africa, where the conditions are different to those of developed countries, research findings in the field of

neurodevelopment and growth in HIV infected children would therefore have to take into account these compounding factors when evaluating results.

The aim of this study is to determine whether there is a significant difference in the neurodevelopmental and anthropometric measurements, at two time points, of HIV infected and HIV uninfected institutionalized children in South Africa. Despite the high prevalence of HIV/AIDS there is one known study in South Africa that refers to the neurodevelopment of HIV infected children, but there are no found studies on the growth of these children. It is therefore valuable to add to the base of knowledge of HIV/AIDS in this population group as it is one of the faster developing countries in Sub-Saharan Africa which also has the highest number of HIV infections.

A possible consequence of this study is to use this knowledge for the early identification of HIV infected children with neurodevelopmental and anthropometric concerns and the subsequent initiation of antiretroviral therapy and nutritional programme. Early identification of developmental delays assists with treatment decisions because it is indicative of neurological involvement. Adequate nutrition and appropriate and timely medical care attributes to better survival rates (Nathan et al. 2003). Schmitt et al. (1991) found that early treatment reduces the neurological deterioration. However the effects of early intervention on the HIV infected children's neurodevelopment in Sub-Saharan African countries is limited and requires further investigation.

The results of this study can also assist in planning more appropriate and effective means of caring for the increasing incidence of orphans in South Africa, both HIV infected and HIV uninfected.