

## **Title: Immunological and Clinical Outcomes of HIV-Positive Adolescents on ART**

**Authors:** Gedeon Nkiko, Rose Angelique Fundi, Dieudonné Ndatimana, Jill Peterson, Diane Gashumba, Cornelia Van Zyl, Sabin Nsabimana

**Background:** Antiretroviral therapy (ART) changed the nature of HIV from a fatal disease to a treatable chronic condition, allowing HIV-infected children to reach adolescence and adulthood. However, positive outcomes rely on optimal ART uptake and adherence, which can be difficult for teenagers due to the psychological vulnerability associated with adolescence. Very little is known about the real course of illness for HIV-positive adolescents in developing countries. This study aims to determine the clinical outcomes of adolescents on ART in Rwanda.

**Method:** After obtaining Rwanda National Ethics Committee exemption, a retrospective cohort analysis was performed August 1-31, 2011 in four selected health centers and three district hospitals in Rwanda. The study included all clients ages 10 to 19 years who had been on ART for at least three years (those who had been initiated on ART after the review period or with incomplete files were excluded). Data were retrieved by independent data collectors from medical charts, pharmacy files and registers using a collection tool (pre-tested on 10 charts for refinement). Collected information was recorded and analyzed using MS Excel 2007 and SPSS v16.

**Results:** Data were collected for 216 adolescents. The mean age was 14 years; 52% were female. At treatment initiation, the mean age was 10 years, the majority of clients were WHO stage 3 or 4 (65.7%) and the median CD4 count was 400 cells/ml.

During data collection, 68.5% were alive and on treatment, 4.6% were lost to follow-up, 2.8% died and 24.1% transferred out. Drug toxicity occurred in 12% cases, dominated by hypersensitivity reaction (3.7%), anemia (3.7%) and Central Nervous System toxicity (2.3%). Immunologic failure was noted in 23% of adolescents and 19% manifested clinical treatment failure. Opportunistic infections occurring after ART initiation included TB (4.5%), parotiditis (1.8%), oral candidiasis (1.8%), non-specific respiratory tract infections (1.4%), necrotic gingivitis (1%) and cytomegalovirus retinitis (0.5%). Severe malnutrition, poor adherence and WHO stage 4 were associated with immunologic failure ( $p < 0.02$ ).

**Conclusion:** Outcomes for adolescents on ART in this study are comparable to those reported in the medical literature for patients in developed countries, but immunologic failure and drug toxicity are higher. There is a need to reinforce patient and provider monitoring and follow-up and educate patients on the importance of adherence. Further study is needed to determine the impact of task shifting on transfer rates and patient outcomes and to clarify the determinants of adherence among adolescents.