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Factors associated with virological failure in adolescents in a rural HIV programme in KwaZulu Natal

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ABSTRACT

Background

In 2010, 2.2 million adolescents were living with HIV (Human Immunodeficiency Virus) worldwide. This study aimed to describe the socio-demographic and clinical characteristics of the adolescents (10-19 years old) initiating anti-retroviral treatment (ART) and to investigate characteristics that are associated with virological failure in adolescents on ART.

Methods

This was an analysis of adolescents initiating ART from June 2004-2010 at the Hlabisa Treatment and Care Programme in KwaZulu-Natal, South Africa. Data was collected from two datasets at Africa Centre for Health and Population Studies. Time to outcomes of death and lost to follow up (LTFU) were quantified using Kaplan-Meier estimates. The outcome was virologic response (< 70copies/ml) after at least 6 months on ART and the associations with an unsuppressed viral load were investigated using multivariable logistic regression.

Results

543 adolescents, median age 15 years (IQR 12-18), initiated ART; 67.8% (368) were females. Age at treatment initiation showed a bimodal distribution, with a peak at 11 years and another at 17-19 years; 61 females aged 16-19 years initiated ART whilst pregnant. At baseline, median CD4 count was 152 cells/μl (IQR 72-251), 392 (72.2%) had prior TB and 129 (23.8%) a weight-for-age z-score ≤ -2 (i.e. were under-nourished). Numbers of adolescents starting ART increased from 53 in the years 2004-2006 to 196 in 2010. Overall mortality was 36.5 per 1000 person years (95% CI 27.2 - 48.8); LTFU 98.8 per1000 person years (95% CI 82.8-118). Adjusting for age and gender, LTFU was significantly higher in females initiating in late adolescence (15-19 years) ($p<0.001$) and 24 (39.3%) of those

initiating ART whilst pregnant were LTFU. The first viral load after initiation was taken at a median time of 11.25 months (IQR 7.78-16.20). Of the 364 adolescents with a viral load result after at least 6 months of ART, 119 (32.7%) had an unsuppressed viral load (95% CI 27.9- 37.5). Adolescents who initiated in the year 2010 were found to have less odds of an unsuppressed viral load compared to those who initiated between 2004 and 2006 [adjusted Odds Ratio (aOR) 0.29 (95% CI 0.11-0.79)]. Those who had the first viral load test done after > 30 months of ART had higher odds of an unsuppressed viral load compared to those tested after 6-12 months of ART [aOR 6.88 (95% CI 1.29-36.66)].

Conclusion

Despite the yearly increase in adolescents initiating ART, good virological responses can be obtained through increased ART support to both individuals and health care providers. Timely viral load monitoring identifies those in need of increased adherence support on ART and may result in good virological responses.

Recommendations

Adolescents on ART are a vulnerable group that requires special attention to improve clinical and virological outcomes. Adolescent friendly ART clinics may be useful in providing this service and mitigate the high attrition rates of those on treatment for HIV. Public health awareness campaigns on HIV and its treatment may have a positive impact on virological response to ART and therefore campaigns targeting adolescents must be intensified. Early virological testing after 6 months on ART to monitor treatment responses helps to identify those with sub-optimal response to ART and reduce the progression to virological failure and drug resistance to anti-retroviral drugs.