

# Ten year overall survival of children and adolescents with Hodgkin lymphoma and HIV in South Africa

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## Abstract

**Background and objectives:** Children with Hodgkin lymphoma (HL) and Human Immunodeficiency Virus (HIV) have low 5 year overall survival rates in South Africa, home to the world's largest HIV population. We aimed to explore factors impacting on survival in children with HIV and HL by comparing those with and without HIV, and to determine long term survival. **Methods:** A retrospective study was conducted to determine survival rates and prognostic factors in South African children and adolescents with HL. Univariate risk factor analysis was performed to analyse prognostic factors. **Results:** Between January 2000 and December 2010, 271 children and adolescents with HL were eligible for analysis. Compared to the 242 HIV-uninfected patients, the 29 HIV-infected patients were younger (median 7.2 vs 10.0 years,  $p=0.052$ ) and more likely to present with Stage IV disease ( $p=0.000$ ). The 5-year overall survival rate (OS) of HIV-infected patients of 49% versus 84% for HIV-uninfected patients ( $p=0.001$ ) appeared to be associated with hypoalbuminaemia ( $<20\text{g/dL}$ ) and a CD4 percentage of  $<15\%$ . Causes of death in the HIV-infected group included disease progression (6/14), infection (4/14), unknown (3/14) and second malignancy (1/14). The 10-year OS was 45% in the HIV-infected cohort and 79% in the HIV-uninfected cohort ( $p=0.000$ ). **Conclusion:** HIV-infected children with HL experience increased mortality due to opportunistic and nosocomial infections. Particular attention should be paid to children and adolescents with hypoalbuminaemia and low CD4 percentages at diagnosis to lower treatment-related mortality. Aggressive supportive care of children with HIV and HL may improve survival.

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2 Supporting information files

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### *Keywords*

Hodgkin Lymphoma, Children, Adolescents, Human Immunodeficiency Virus, South Africa, Prognostic factors

### *Abbreviations*

ABVD Adriamycin, bleomycin, vinblastine and dacarbazine

ABVD-ChlVVP Adriamycin, bleomycin, vinblastine and dacarbazine - chlorambucil, vinblastine, procarbazine, prednisolone

ART Antiretroviral Therapy

BMI Body mass index

CI Confidence Interval

CT Contrast enhanced computed tomography

EBV Epstein Barr Virus

FdG-PET-CT Fluorodeoxyglucose-positron emission tomography-CT

G-CSF Granulocyte-colony stimulating factor

HL Hodgkin lymphoma

HIV Human Immunodeficiency Virus

LD Lymphocyte depleted

MC Mixed cellularity

MRI Magnetic resonance imaging

OPPA/OEPA-COPP Vincristine, procarbazine/etoposide, prednisone, adriamycin-cyclophosphamide, vincristine, prednisone, procarbazine

OS Overall survival rate

PCR Polymerase chain reaction

POU Paediatric oncology units

SD Standard deviation

WHO World Health Organisation

### *Abstract*

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Geel JA, Eyal K, Rowe B, Chirwa T, Van Heerden J, Omar F, Stones DK, Goga Y, Stefan C, Van Emmenes B, Wedi O, Vaithilingum M, Van Zyl A Hendricks M. The impact of HIV infection on overall survival in children with Hodgkin Lymphoma in South Africa.

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Table 1. Baseline characteristics of Children with HL 17 MAY 2020.doc available at <https://authorea.com/users/323766/articles/452292-ten-year-overall-survival-of-children-and-adolescents-with-hodgkin-lymphoma-and-hiv-in-south-africa>

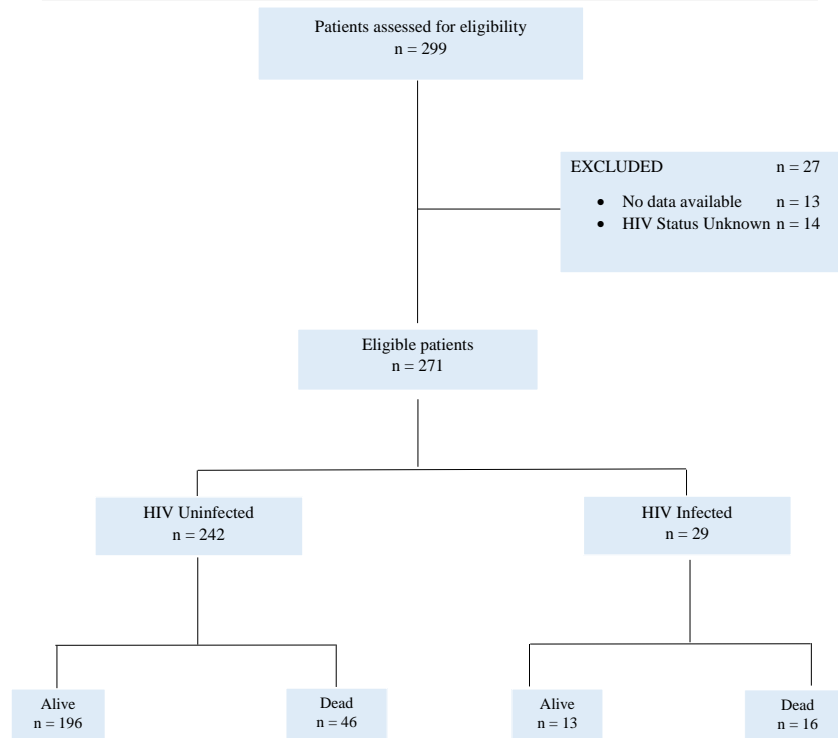
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Table 2. HL HIV causes of death 09FEB2020.doc available at <https://authorea.com/users/323766/articles/452292-ten-year-overall-survival-of-children-and-adolescents-with-hodgkin-lymphoma-and-hiv-in-south-africa>

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Table 3 Univariate risk factor analysis in HIV positive children 17 May 2020.doc.docx available at <https://authorea.com/users/323766/articles/452292-ten-year-overall-survival-of-children-and-adolescents-with-hodgkin-lymphoma-and-hiv-in-south-africa>

Figure 1. Consort Diagram of Enrolment, Retention and Status at Conclusion of Follow-up



# Survival analysis of HIV infected and uninfected patients

