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Utility of total lymphocyte count as an affordable surrogate for CD4 lymphocyte count in HIV infected Nepali patients

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Introduction: AIDS is a disease of human immune system caused by Human Immunodeficiency Virus. Immunologically it is defined as the condition characterized by CD4 cell count less than 200cells/mm^3. In developing countries the resource are limited so that CD4 count is not easily available in every parts of the country and is too expensive to afford. The Total Lymphocyte Count (TLC) has been found to be an inexpensive and useful surrogate marker of CD4 count for staging disease, timing of initiation of Antiretroviral Therapy (ART) and response to ART. **Objective:** To study the relationship between the T-cell subsets (CD3 and CD4) in HIV patient and to evaluate TLC as a surrogate marker of CD4 T-cell count. **Methods:** A total of 303 samples were evaluated from July 2010 to September 2010 at NPHL for this study. The blood sample were analyzed by FACS count and the result were analyzed by SPSS 16.0 to determine sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) to find out the relationship between the T cells subsets and evaluate TLC as a surrogate marker of CD4 T cell count for the diagnosis of CD4 count <200 cell/mm^3 and <350cell/mm^3. **Results:** There is a strong co-relation between CD4 count and TLC (r=0.714, p< 0.01) and CD4 count and CD3 count (r=0.707, p<0.01). A threshold value of 1,400cell/mm^3, we found a maximal combination of sensitivity (70.1%), specificity (81.4%) and NPV (88.9%), but PPV is only 56.2% for a CD4+ T cell count<200 cell/mm^3. A CD3 count of <1000cell/mm^3 would have a maximum combination of sensitivity (72.7%), specificity (81%) and NPV (89.7%) but PPV is only 56.6% for CD4 T-cell count <200 cell/mm^3. **Conclusion:** Total lymphocyte count may provide a simple and cost effective alternative for prioritizing therapy initiation in resources- limited settings. Our study showed a good co-relation (Pearson) of CD4 count with CD3 and TLC, result suggest that, if appropriately validated, judicious application of total lymphocyte counts could overcome one of the practical obstacles to more widespread provision of ART in resource- poor settings.

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Predictors of treatment failure and time to detection and switching in HIV-infected Ethiopian children receiving first line anti-retroviral therapy

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Background: The emergence of resistance to first line antiretroviral therapy (ART) regimen leads to the need for more expensive and less tolerable second line drugs. Hence, it is essential to identify and address factors associated with an increased probability of first line ART regimen failure. The objective of this article is to report on the predictors of first line ART regimen failure, the detection rate of ART regime failure, and the delay in switching to second line ART drugs. **Methods:** A retrospective cohort study was conducted from 2005 to 2011. All HIV infected children under the age of 15 who took first line ART for at least six months at the four major hospitals of Addis Ababa, Ethiopia were included. Data were collected, entered and analyzed using Epi info/ENA version 3.5.1 and SPSS version 16. The Cox proportional-hazard model was used to assess the predictors of first line ART failure. **Results:** Data of 1186 children were analyzed. Five hundred seventy seven (48.8%) were males with a mean age of 6.22 (SD = 3.10) years. Of the 167(14.1%) children who had treatment failure, 70 (5.9%) had only clinical failure, 79 (6.7%) had only immunologic failure, and 18 (1.5%) had both clinical and immunologic failure. Patients who had height for age in the third percentile or less at initiation of ART were found to have higher probability of ART treatment failure [Adjusted Hazard Ratio (AHR), 3.25 95% CI, 1.00-10.58]. Patients who were less than three years old [AHR, 1.85 95% CI, 1.24-2.76], chronic diarrhea after initiation of antiretroviral treatment [AHR, 3.44 95% CI, 1.37-8.62], ART drug substitution [AHR, 1.70 95% CI, 1.05-2.73] and base line CD4 count below 50 cells/mm3 [AHR, 2.30 95% CI, 1.28-4.14] were also found to be at higher risk of treatment failure. Of all the 167 first line ART failure cases, only 24 (14.4%) were switched to second line ART with a mean delay of 24 (SD = 11.67) months. The remaining 143 (85.6%) cases were diagnosed to have treatment failure retrospectively by the authors based on their records. Hence, they were not detected and these patients were not offered second line ARTs. **Conclusions:** Having chronic malnutrition, low CD_4 at base line, chronic diarrhea after initiation of first line ART, substitution of ART drugs and age less than 3 years old were found to be independent predictors of first line ART failure in children. Most of the first line ART failure cases were not detected early and those that were detected were not switched to second line drugs in a timely fashion. Children with the above risk factors should be closely monitored for a timely switch to second line highly active anti-retroviral therapy.

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