

Total lymphocyte count as a surrogate marker for predicting CD4 count of HIV-infected children and adolescents: a retrospective evaluation

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Background: CD4 count is a standard measure of immunodeficiency in adults and children infected with HIV to initiate and monitor HAART, but it is not widely available in resource limited countries.

Objective: The objective was to ascertain the correlation between total lymphocyte count (TLC) and CD4 count of HIV-infected children before and during HAART, and assess thresholds of TLC for making decisions about the initiation and monitoring HAART in China.

Method: This was a retrospective evaluation. 266 HIV-infected children with TLC and CD4 count from four counties (Shangcai, Queshan, Shengqiu and Weishi) were included in the study. Spearman rank order correlation and receiver operating characteristic (ROC) were used.

Results: An overall positive correlation was noted between TLC and CD4 count (Pre-HAART, $r = 0.791$, $P < 0.001$; Six Months of HAART, $r = 0.625$; $P = 0.001$; Twelve Months of HAART, $r = 0.680$, $P = 0.001$). The ROC curve between TLC and CD4 count showed TLC ≤ 2635 cells/mm³ could predict CD4 count of ≤ 350 cells/mm³ with 78.28% sensitivity, 71.11% specificity, 93.0% PPV, and 40.0% NPV at pre-HAART. Meanwhile, the optimum prediction for CD4 count of ≤ 350 cells/mm³ was a TLC of ≤ 2475 cells/mm³ at the time point of 6 months (76.62% sensitivity and 69.64% specificity) and 12 months (77.03% sensitivity and 75.52% specificity) during HAART (Table 1).

Conclusion: TLC can be used as a surrogate marker for predicting CD4 count of HIV-infected children for making decisions about the initiation and monitoring response to HAART in resource limited countries.

TLC (cells/mm ³)	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)
Pre-HAART				
2435	58.82	82.22	94.2	28.9
2535	67.42	80.00	94.3	33.3
2635	78.28	71.11	93.0	40.0
2735	87.33	57.78	91.0	48.1
2835	94.57	40.00	88.6	60.0
Six Months of HAART				
2275	60.39	81.25	81.6	56.0
2375	68.18	75.89	79.5	63.4
2475	76.62	69.64	77.6	68.4
2575	81.82	64.29	75.9	72.0
2675	90.91	50.00	71.4	80.0
Twelve Months of HAART				
2275	64.86	85.42	63.2	86.3
2375	64.86	81.25	57.1	85.7
2475	77.03	75.52	54.8	89.5
2575	83.78	65.62	48.4	91.3
2675	89.19	57.29	44.6	93.2

Table 1: Different cutoff values of TLC predicting CD4 count ≤ 350 cells/mm³ at before and during HAART.