Retrovirology

Poster presentation

Low-cost dynabead and cytospheres compared to FACSCount to monitor patients on antiretroviral therapy at a public clinic in Kampala, Uganda

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Background
There is an increased access to antiretroviral therapy in developing countries and without proper laboratory monitoring, the benefit of treatment may be curtailed by development of resistance. Current laboratory methods used are expensive and require much individual skill.

Methods
We compared CD4 cell counts obtained on replicate samples by Dynabead and Cytospheres to those obtained by FACSCount (Beckon Dickson). Paired data were compared by linear regression and we calculated the sensitivity, specificity negative and positive predictive values. Average time needed to learn and perform a single test was calculated.

Results
We tested 1672 samples with Dynabeads and 1445 samples with Cytospheres. Mean CD4 was 230 cells/mm3 (SD, 139) and 239 cells/mm3 (SD, 140) by Dynabeads and FC, respectively. Mean CD4 was 186 cells/mm3 (SD, 101) and 242 cells/mm3 (SD, 136) by Cytospheres and FC, respectively. Linear regression slopes were 0.85 and 0.58 for Dynabeads and Cytospheres, respectively with Pearson correlation coefficients of 0.85 and 0.78. For Dynabeads, sensitivity, specificity, PPV and NPV to predict CD4 below 200 cells/mm3 were 87%, 84%, 82%, and 89%, respectively. For Cytospheres, values were 93%, 59%, 64%, and 91%, respectively. The turn around time per test was 35 and 7 minutes by Dynabeads and Cytospheres respectively.

Conclusion
Although Dynabeads more accurately measured CD4 than Cytospheres; both methods underestimated CD4 when compared to FC. Dynabeads are more labour intensive but can be used in peripheral health centers to monitor patients on Art and thus control the development of resistant virus.