Long-term CD4 cell count improvement in HIV-1 infected individuals with long-term sustained virological suppression on cART

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Background
- Restoration of CD4 cell count levels towards normal in cART-treated HIV-infected individuals may not be feasible when CD4 cell counts at the start of cART are low
- Previously, we investigated changes in CD4 cell counts in patients on continuous cART and with viral suppression <500 copies/ml.
- Objective: Extending these observations to patients with suppressed viral load below 50 copies/ml for a period of up to 8 years.

Methods
HIV-1 infected patients selected from the national observational ATHENA cohort who were:
- ART-naive and >16 years of age at start of cART
- Virologically suppressed to below 50 copies/ml within 9 months after start.

Outcome:
- CD4 cell counts between start of cART and earliest of following events: end of follow-up, cART interruption >2 weeks, start of chemotherapy or peg-interferon, first of 2 consecutive plasma viral load measurements >50 copies/ml.
- Statistical analysis:
- CD4 cell counts were longitudinally modelled using mixed effects models.
- The association between CD4 slopes, CD4 cell counts at the start of cART (<50, 50-200, 200-350, 350-500, and ≥500 cells/mm³) and gender, HIV RNA and age at cART initiation, transmission risk group, HBV (HBsAg-positive) and HCV (HCV RNA, if not available HCV Ab) co-infection and region of origin were investigated.
- A random intercept and 3 random slopes (0-6, 6-24, and ≥24 months) for each patient was included.

Results

- Figure: Median CD4 cell counts during virological successful continuous cART according to CD4 cell count at start. At least 5 patients remaining in follow-up.

<table>
<thead>
<tr>
<th>Region of origin</th>
<th>Male</th>
<th>Female</th>
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<tbody>
<tr>
<td>West Europe/N-Africa</td>
<td>383 (7)</td>
<td>436 (8)</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>576 (10)</td>
<td>614 (8)</td>
</tr>
<tr>
<td>Other</td>
<td>376 (7)</td>
<td>244 (4)</td>
</tr>
</tbody>
</table>

Table 1. Demographic and clinical characteristics at the start of cART.

<table>
<thead>
<tr>
<th>Mean (95% CI) differences in annual CD4 cell changes after starting cART</th>
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<tbody>
<tr>
<td>0-6 m</td>
</tr>
<tr>
<td>CD4 cell count</td>
</tr>
<tr>
<td>&lt;50</td>
</tr>
<tr>
<td>50-200</td>
</tr>
<tr>
<td>200-350 (ref)</td>
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<tr>
<td>350-500</td>
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<tr>
<td>≥500</td>
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<tr>
<td>Median (IQR)</td>
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</table>

Table 2. Differences in annual changes in CD4 cell count during virological successful continuous cART. West: Western Europe and North America, SSA: Sub-Saharan Africa.

Conclusions
- Eight years of sustained virological suppression <50 copies/ml on cART, resulted in median CD4 cell counts levels around 800 cells/mm³ when cART was initiated ≥350 CD4 cells/mm³.
- CD4 cell count increases between 0-8 years were smaller in patients ≥50 years.