Characterizations of weight gain following antiretroviral regimen initiation in treatment-naive individuals living with HIV

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Background
- Obesity and body mass index (BMI) have been rising among people living with HIV (PWH) over time
- Recent reports of weight gain associated with ART
  - With integrase inhibitors (INSTI)2
  - With dolutegravir (DTG)2,4
  - With TAF2

Objective
To describe weight gain continuously and at various thresholds (≥3 kg, ≥5 kg, or ≥5% increase from baseline) in ART-naive PWH initiating common core agents

Methods
Study population
- OPERA cohort
  - Prospectively captured, routine clinical data from electronic health records in the US (84 clinics, 17 states, 1 US territory)
- 8% of PWH in care in the US

Inclusion criteria
- ART-naive PWH ≥18 years (not pregnant or transgenic)
- Initiating ART for the first time between 01/01/2013 and 31/01/2017 with 1 core agent: dolutegravir (DTG), elvitegravir/cobicistat (EVG/c), raltegravir (RAL), rilpivirine (RPV), or boosted darunavir (bDRV)
- 2 baseline viral load measurement
- 2 weight measurement s 3 months before ART initiation
- 1 weight measurement during follow-up

Observation period: from regimen initiation until: (1) core agent discontinuation/addition, (2) ≥ 12 months without contact, (3) pregnancy, (4) death, or (5) study end (31/01/2018)

Analyses
- Changes in weight from ART initiation assessed at 6, 12, and 24 months
- 3 months
  - Mean change in weight or BMI
  - Changes in BMI category:
    - Underweight (<18.5)
    - Normal (18.5–24.9)
    - Overweight (25.0–29.9)
    - Obese (≥30)
  - Pronounced weight gain: ≥3 kg, ≥5 kg, ≥5%

Results
Table 1. Baseline demographic and clinical characteristics (N=6,266) (%)
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>DTG</th>
<th>EVG/c</th>
<th>RAL</th>
<th>RPV</th>
<th>LDRV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age ≥50 years</td>
<td>25%</td>
<td>23%</td>
<td>26%</td>
<td>25%</td>
<td>25%</td>
</tr>
<tr>
<td>Female</td>
<td>245 (11.6)</td>
<td>285 (10.7)</td>
<td>316 (10.6)</td>
<td>331 (11.7)</td>
<td>319 (11.6)</td>
</tr>
<tr>
<td>Black non-Hispanic</td>
<td>881 (46.1)</td>
<td>825 (46.0)</td>
<td>901 (46.1)</td>
<td>906 (46.3)</td>
<td>863 (45.4)</td>
</tr>
<tr>
<td>Hypertension</td>
<td>240 (11.3)</td>
<td>300 (11.3)</td>
<td>294 (11.3)</td>
<td>315 (11.7)</td>
<td>282 (11.3)</td>
</tr>
<tr>
<td>Endocrine disorders*</td>
<td>231 (11.5)</td>
<td>258 (9.7)</td>
<td>22 (10.0)</td>
<td>44 (5.7)</td>
<td>92 (12.2)</td>
</tr>
<tr>
<td>TDF use</td>
<td>247 (11.7)</td>
<td>1167 (43.8)</td>
<td>5.7%</td>
<td>144 (19.0)</td>
<td>158 (26.8)</td>
</tr>
<tr>
<td>Hypertension</td>
<td>228 (10.8)</td>
<td>245 (9.2)</td>
<td>22 (9.2)</td>
<td>90 (19.1)</td>
<td>87 (14.7)</td>
</tr>
<tr>
<td>HIV RNA ≥100,000 copies/mL</td>
<td>952 (46.2)</td>
<td>853 (43.2)</td>
<td>25 (1.0)</td>
<td>36 (6.8)</td>
<td>239 (43.0)</td>
</tr>
<tr>
<td>aCD4 cell count ≥350 cells/µl</td>
<td>453 (21.5)</td>
<td>583 (21.1)</td>
<td>37 (13.0)</td>
<td>53 (9.0)</td>
<td>250 (42.1)</td>
</tr>
</tbody>
</table>

* p-value <0.05 for the comparison with ART naive

Table 2. Mean unadjusted change in BMI from baseline, kg/m² (% C)
<table>
<thead>
<tr>
<th>Characteristic</th>
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<th>RAL</th>
<th>RPV</th>
<th>LDRV</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 months (n=5,751)</td>
<td>0.8 (0.7, 0.9)</td>
<td>0.8 (0.7, 0.9)</td>
<td>0.4 (0.1, 0.7)</td>
<td>0.5 (0.4, 0.6)</td>
<td>0.9 (0.7, 1.1)</td>
</tr>
<tr>
<td>12 months (n=6,406)</td>
<td>1.1 (1.0, 1.5)</td>
<td>1.2 (1.0, 1.5)</td>
<td>0.9 (0.9, 1.1)</td>
<td>0.5 (0.2, 0.8)</td>
<td>1.6 (1.1, 2.1)</td>
</tr>
<tr>
<td>24 months (n=2,427)</td>
<td>1.7 (1.5, 1.9)</td>
<td>1.4 (1.2, 1.6)</td>
<td>0.6 (0.5, 1.1)</td>
<td>1.7 (1.6, 1.9)</td>
<td>1.8 (1.2, 2.4)</td>
</tr>
</tbody>
</table>

Discussion
- Substantial proportion of PWH experiencing weight gain across groups over up to 24 months of follow-up (Fig 1)
- The proportion of PWH with pronounced weight gain varied across thresholds and group (Fig 1)
- Large proportion of PWH with pronounced weight gain:
  - ≥30-49% gained ≥5% of their baseline body weight (Fig 1)
  - ≥15–33% of PWH with normal or overweight baseline BMI gained enough weight to increase by ≥1 BMI category at 12 months (Fig 3)
- PLWH initiating RPV experienced the greatest weight gain (Fig 1.2): highest proportion of high viremia and low CD4 cell counts (Table 1)
- PLWH initiating EVG/c experienced the least weight gain (Fig 1.2); lowest proportion of high viremia and low CD4 cell counts (Table 1)
- Limitation: no adjustment for baseline differences between groups for weight gain related to restoration of health

Key Findings
- Description study (unadjusted analyses)
  - ≥30-49% of ART-naive PWH gained ≥5% of their baseline weight 12 months after ART initiation
  - Groups with greatest weight gain after ART initiation were the most viroemic and immune compromised at baseline (vice versa)
  - Suggests a significant contribution of restoration of health on weight gain in ART-naive PWH

References

Acknowledgements
This research would be impossible without the generosity of people living with HIV and their caregivers. Additionally, we are grateful for the following individuals: Brian Boden (data management and project coordination); Jeff Kowalewski (data entry); Denise Todd (editorial review); Judy Storcken (BLM Terminology Classification); Kimberly Medley (data support)

Support
This research was sponsored by ViiV healthcare

17th European AIDS Conference (EACS 2019), Basel, Switzerland, 6-9 November 2019