Increased Immune Activation Following Acute Sleep Deprivation in People with HIV on ART

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Introduction

- Up to 70% of people with HIV (PWH) complain of sleep disturbances
- Extracellular adenosine (ADO) is a potent immune regulatory nucleoside that mediates immune activation
- ADO metabolism is dysregulated in PWH
- Sleep behaviors alter ADO metabolism
- Our prior research demonstrated that CD73 expression was upregulated in PWH with obstructive sleep apnea
- It is unknown if total sleep deprivation (TSD) alters peripheral adenosine regulation and levels of inflammation and immune activation in virally suppressed PWH on ART

Methods

- People with HIV (PWH n = 20) underwent sleep deprivation with fasting
- Plasma was analyzed for:
  - CD4+ T lymphocytes
  - CD8+ T lymphocytes
  - Soluble Markers

Table 1 Participant Demographics

<table>
<thead>
<tr>
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<th>PWH (n=20)</th>
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<tbody>
<tr>
<td>Age (yrs)</td>
<td>Median (IQR)</td>
</tr>
<tr>
<td>Male (n, %)</td>
<td>15 (75%)</td>
</tr>
<tr>
<td>Black Race (n, %)</td>
<td>7 (35%)</td>
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<tr>
<td>Body mass index (kg/m²)</td>
<td>26.7 (22.7, 31.0)</td>
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<tr>
<td>CD4+ count (cells/mm³)</td>
<td>760 (678, 883)</td>
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<tr>
<td>Apnea Hypopnea Index (4%)</td>
<td>4.7 (1.7, 9.8)</td>
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</tbody>
</table>

Discussion

- Among virally suppressed PWH on ART, total sleep deprivation resulted in a significant increase in CD8+ T cell activation and trend for increased monocyte and macrophage activation
- Total sleep deprivation did not result in a compensatory increase in ectoenzyme expression or in the plasma levels of adenosine
- Interventions targeting sleep disturbances among PWH could be beneficial in addressing chronic inflammation in HIV

**Figure 1 Extracellular Purinergic Metabolism**

**Table 1 Participant Demographics**

**Figure adapted from: Hisson, Borker, et al. (2021)**

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