Background

- HIV+ persons bear an excess burden of chronic kidney disease (CKD).
- However, conventional methods to assess kidney health are insensitive and non-specific for identifying early kidney injury.

Methods

- Cross-sectional study of HIV+ persons who were not on tenofovir disoproxil fumarate (TDF) in the Multicenter AIDS Cohort Study (MACS) and the Women's Intergenerational HIV Study (WIHS).
- We measured levels of 14 biomarkers that captured multiple dimensions of kidney injury.
- We evaluated associations of known CKD risk factors with urinary biomarker levels.

Results

- Each CKD risk factor was associated with a distinct pattern of urine biomarkers, the magnitudes of association between each CKD risk factor and biomarker varied (Figure 2).

Discussion

- Each CKD risk factor was associated with levels of a unique set of complementary urinary biomarkers.
- The biomarker panel reflects incipient kidney disease risk at an earlier stage than can be clinically detected with serum creatinine.
- The specific pattern of differences in urinary biomarkers levels can help to discriminate the contribution of each CKD risk factor towards kidney injury.
- This can inform clinical decision-making, such as intensification of renal-protective therapy, aggressive treatment of modifiable risk factors, and identification and removal of potential nephrotoxins.

Limitations

- Cross-sectional study.
- We lacked kidney biopsy results to confirm the presence of kidney injury histologically.
- Our sample size may have been insufficient to detect findings with moderate effect sizes.

Conclusions

- Each CKD risk factor is associated with a distinct pattern of change in urine biomarkers levels.
- Our findings highlight the potential clinical utility of routine measurement of multiple biomarker levels.
- However these findings require validation in larger, more diverse patient populations.
- Ultimately, parsimonious algorithms that integrate multiple biomarker levels results along with clinical data will be critical for translating these novel diagnostic strategies into standard clinical practice.

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Table 1: Demographic and Clinical Characteristics, Stratified by Gender

<table>
<thead>
<tr>
<th>Age (y)</th>
<th>Black Race</th>
<th>Diabetes Mellitus</th>
<th>Hypertension</th>
<th>CKD stage, GFR (mL/min/1.73m²)</th>
<th>HIV RNA &lt; 80 copies/mL</th>
<th>HAART Discontinuation</th>
<th>CD4 count, cells/mm³</th>
<th>HIV RNA log₁₀ copies/mL</th>
<th>eGFR, mL/min</th>
<th>MCP-1</th>
<th>TIMP-1</th>
<th>KIM-1</th>
<th>YKL-40</th>
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<tbody>
<tr>
<td>Overall</td>
<td>46 (41, 51)</td>
<td>44 (41, 51)</td>
<td>47 (41, 51)</td>
<td>42 (37, 46)</td>
<td>44 (41, 51)</td>
<td>45 (41, 51)</td>
<td>41 (37, 46)</td>
<td>41 (37, 46)</td>
<td>41 (37, 46)</td>
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<tr>
<td>MACS</td>
<td>58 (53, 63)</td>
<td>57 (53, 63)</td>
<td>59 (53, 63)</td>
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Figure 1: Hypothesized Site or Mechanism of Injury for Urine Kidney Injury Markers.