Association of skin aging severity with blood isoprostane levels in healthy middle-aged Japanese women

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BACKGROUND
- One of the central mechanisms of aging is hypothesized to be oxidative stress.
- To date, quantification of oxidative stress in human organ systems has been difficult.
- One of the best methods currently available is via blood isoprostane levels which not only reflect systemic oxidative damage, but associate with oxidative stress in multiple non-dermatologic organ systems.

OBJECTIVE
- To determine if human skin aging severity associates with blood isoprostane levels, specifically PGF2a, 8-iso-PGF2a, and 15R-8-iso-PGF2a, while controlling for covariates such as ultraviolet light exposure, diet, medication and supplement use.

STUDY DESIGN
- Healthy female volunteers aged 45-60 yrs surveys and blood taken n=70
- BMI < 1 S.D. of mean of 70 volunteers retained n=70
- Skin age (SA) assessed by 4 dermatologists blinded to CA
- Average SA (SAavg) calculated
- Blood isoprostane levels and confounders compared

RESULTS
- Mean isoprostane levels (with S.D.) by skin age phenotype

<table>
<thead>
<tr>
<th>Isoprostane</th>
<th>CA≤SA (95% C.I.)</th>
<th>CA&gt;SA (95% C.I.)</th>
<th>Adjusted p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PGF2a</td>
<td>46.90 (10.4, 83.4)</td>
<td>148.24 (119.8, 178.6)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>8-iso-PGF2a</td>
<td>46.30 (36.6, 54.0)</td>
<td>67.63 (60.2, 74.2)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>15R-8-iso-PGF2a</td>
<td>56.17 (42.9, 69.4)</td>
<td>71.93 (61.3, 82.6)</td>
<td>0.11</td>
</tr>
</tbody>
</table>

Table 1. When mean values were adjusted for age, body mass index, education level, ultraviolet light exposure, work stress, diet, medication and supplement use, p<0.01 remained for both isoprostanes.

CONCLUSIONS
- This study represents the first report in the medical literature that increased skin aging phenotype may be reflected in systemic levels of PGF2a and 8-iso-PGF2a isoprostanes.

LIMITATIONS
- This study is limited by sample size.

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