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

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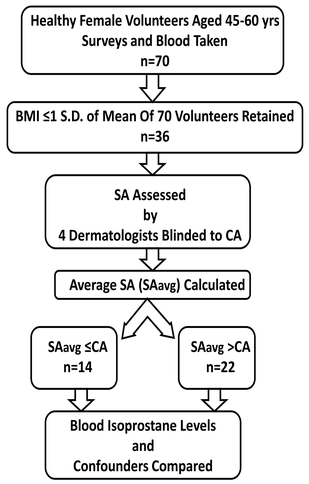
BACKGROUND

- 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-PFG2a, while controlling for covariates such as ultraviolet light exposure, diet, medication or supplement use.

STUDY DESIGN



METHODS

- IRB approved
- Inclusion criteria:
  - women aged 45-60 years old
  - in general good health as assessed by the investigator
- Exclusion criteria:
  - prior use of prescription medications to improve the appearance of photo damaged skin
  - facial cosmetic procedures
  - smoking
  - dermatologic conditions on the face
  - use of self-tanner two days prior to enrollment
- Based on the SAs, subjects were then divided into 2 groups: average SA≤CA and average SA>CA.

RESULTS

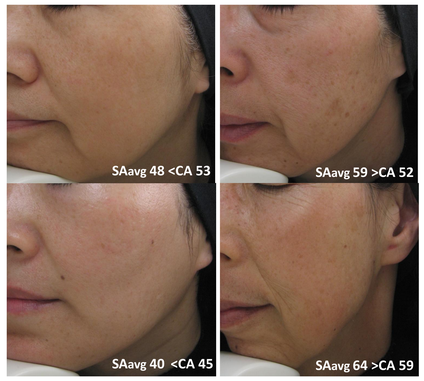


Fig. 1 Examples of subjects' skin age assessments.

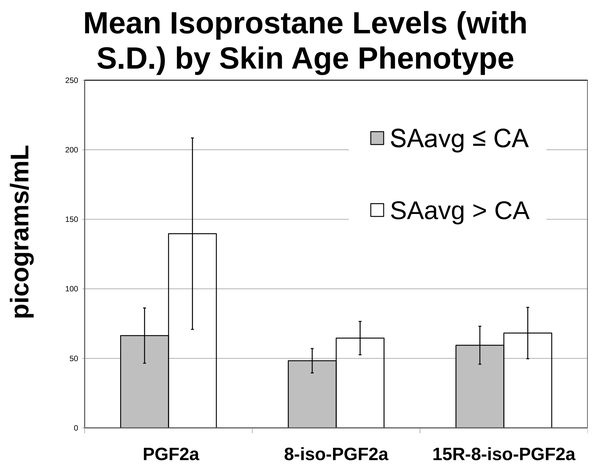


Fig. 2. Mean isoprostane levels (with error bars indicating one standard deviation (SD)) according to skin age phenotype. The asterisks indicate that PGF2a and 8-iso-PGF2a levels are significantly different between the SA_{avg} ≤CA group and the SA_{avg} >CA group.

RESULTS (continued)

Isoprostane	SA_{avg} ≤CA in picograms/mL (95% C.I)	SA_{avg} >CA in picograms/mL (95% C.I.)	Adjusted p-value
PGF2a	46.90 (10.4, 83.4)	149.24 (119.8, 178.6)	<0.01
8-iso-PGF2a	45.30 (36.6, 54.0)	67.23 (60.2, 74.2)	<0.01
15R-8-iso-PGF2a	56.17 (42.9, 69.4)	71.93 (61.3, 82.6)	0.11

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.

LIMITATIONS

- This study is limited by sample size.

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.

FUNDING

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ACKNOWLEDGEMENTS

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