

## Concentrations Of Urinary 8-OHdG And 8-Isoprostane In Women Exposed To Woodsmoke In A Cookstove Intervention Study In San Marcos, Peru

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**Rationale:** Nearly half of the world's population is exposed to household air pollution (HAP) due to long hours spent in close proximity to unvented cooking fires. We aimed to investigate whether woodsmoke exposure induces oxidative stress by examining the relationship between woodsmoke exposure and biomarkers of DNA and lipid oxidation among study subjects.

**Methods:** We conducted HAP exposure assessment within the framework of a community-randomized controlled trial of 51 communities in San Marcos Province, Cajamarca Region, Peru. The first morning urine voids were collected from 183 control and 155 intervention stove users in this study. Urine samples from a subset of 45 control and 39 intervention stove users, for whom PM<sub>2.5</sub> and/or CO data were available, were analyzed for 8-OHdG and 8-isoprostane. Control households used a number of stoves including open fire and chimney stoves while intervention households used study-promoted OPTIMA chimney stoves. The primary focus of this study was to assess urinary oxidative stress among all study subjects. General linear models and correlation analyses were performed.

**Results:** Creatinine corrected urinary oxidative stress biomarkers ranged from 11.2 to 2270.0 ug/g creatinine for 8-OHdG and from 0.1 to 4.5 ug/g creatinine for 8-isoprostane among all study subjects (n=84). After controlling for the effects of traffic in the community and eating food exposed to fire among all subjects, cooking time was weakly, but positively correlated with urinary 8-OHdG (correlation coefficient (r)=0.29, p=0.01, n=80). Subjects' 48hr time integrated personal CO exposures were negatively correlated with 8-OHdG (r=-0.26, p=0.03, n=73). 48hr time integrated personal PM<sub>2.5</sub> was negatively, but marginally correlated with urinary 8-isoprostane after controlling for the effect of distance of homes to the road (r=-0.21, p=0.09, n=69).

**Conclusion:** Urinary 8-isoprostane levels reported in the literature are comparable to results reported in the current study. However, 8-OHdG levels appear to be elevated among study subjects when compared to values of urinary 8-OHdG reported in the scientific literature. Results suggest that there is sustained systemic oxidative stress in terms of 8-OHdG among these women. Further investigation on the cumulative effects of constant exposure to HAP and other activities that increase systemic oxidative stress among such populations is needed.

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