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Urinary 1-Hydroxypyrene Glucuronide and 8-Hydroxydeoxyguanosine as Biomarkers of the Asian Dust Event

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This study evaluated the potential usefulness of urinary 1-hydroxypyrene glucuronide (1-OHPG) and 8-hydroxy-deoxyguanosine (8-OHdG) as biomarkers of the Asian Dust event. Urine samples were collected from 224 subjects (112 children and 112 their mothers) from Seoul (n=60), Incheon (n=104) and Pohang (n=60) in South Korea. Urine samples were collected from the same individuals twice before and after the Asian Dust event. All 448 samples were analyzed for 1-OHPG and 78 samples were analyzed for 8-OHdG. Urinary 1-OHPG was measured by synchronous fluorescence spectroscopy after immunoaffinity purification using monoclonal antibody 8E11. Levels of 8-OHdG were measured by 8-OHdG ELISA Kit. Urinary 1-OHPG (GM \pm GSD = 323.59 \pm 2.09 pg/ml) and 8-OHdG levels (6.61 \pm 2.75 ng/ml) after the Asian Dust event were higher than those before the event (223.87 \pm 1.86 and 3.31 \pm 3.98, respectively) in Seoul (p<0.05), whereas 1-OHPG levels (177.63 \pm 1.91) after the event were lower than the levels before the event (218.78 \pm 1.70) in Pohang (p<0.05). No differences in urinary 1-OHPG and 8-OHdG levels in Incheon were observed. There was a significant correlation between urinary 1-OHPG and 8-OHdG levels both after (n=78, r=0.437, p<0.001) and before the event (r=0.456, p<0.001). Multiple linear regression analysis indicated that type of cooking fuel was a significant predictor for log-transformed 1-OHPG (overall model R²=0.11). Although the Asian Dust event was very mild in this year than previous years, our findings suggest that urinary 1-OHPG and 8-OHdG levels increased after the event and they could be used as useful biomarkers for the Asian dust event.

Keyword : 1-OHPG, 8-OHdG, Asian Dust event