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

Dong-Ho Yoo[1], Zhong Min Li[2], Kyoung-Ho Lee[1], Soo-Hun Cho[1], Ho-Jang Kwon[3], Deahee Kang[1]

[1]Department of Preventive Medicine, Seoul National University College of Medicine, Seoul Korea, [2]College of Public Health Science, Jilin University, Changchun, China, [3]Department of Preventive Medicine, Dankook University College of Medicine, Chon-An Korea

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), Inchon (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 ± GSD = 323.59 ± 2.09 pg/mℓ) and 8-OHdG levels (6.61 ± 2.75 ng/ml) after the Asian Dust event were higher than those before the event (223.87 ± 1.86 and 3.31 ± 3.98, respectively) in Seoul ($p<0.05$), whereas 1-OHPG levels (177.63 ± 1.91) after the event were lower than the levels before the event (218.78 ± 1.70) in Pohang ($p<0.05$). No differences in urinary 1-OHPG and 8-OHdG levels in Inchon 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 $R^2=0.11$). 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