

## 납과 아연이 산화적 손상에 미치는 영향

### Dietary Zinc Protects against Increase of MDA by Lead: Biological Monitoring for Environmental Surveillance

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#### Abstract

**Introduction:** Lead has been reported to induce a variety of diseases including cancer through the production of oxidative stress. Malondialdehyde (MDA) is a by-product of lipid peroxidation produced through oxidative stress pathway and zinc is a major antioxidant found in food. Therefore, we hypothesized that blood lead as a biomarker of environmental lead exposure increases the level of MDA as an oxidative stress indicator and dietary zinc intake protects against increase of MDA level produced by blood lead. **Methods:** In this study, we tried to evaluate the effects of blood lead and dietary zinc intake on MDA level in 387 non-occupationally exposed women drawn from Biological Monitoring for Environmental Surveillance (BIOMES). Blood samples were analyzed by atomic

absorption spectrometry, AAnalyst 100, for the determination of lead level and thiobarbituric acid reactive substances (TBARS) were determined for MDA level measurement in urine samples. **Results:** When effects of blood lead and dietary zinc intake on MDA level were estimated separately, the MDA level showed positive relationship with blood lead level and negative relationship with dietary zinc intake significantly (lead, regression coefficient = 0.1729,  $P = 0.0016$ ; and zinc, regression coefficient = - 0.1151,  $P= 0.0395$ , respectively). These effects were also shown after being adjusted for age, smoking status, and alcohol consumption (lead, regression coefficient = 0.1536,  $P = 0.0091$ ; and zinc, regression coefficient = - 0.1101,  $P= 0.0560$ , respectively). We made lead/zinc ratio as a new exposure indicator because of potential of lead and zinc competition and then estimated the effect of lead/zinc ratio on MDA level. Lead/zinc ratio showed positive relationship with MDA level significantly (regression coefficient = 0.1390,  $P= 0.0003$ ). This effect was also shown after being adjusted for age, smoking status, and alcohol consumption (lead/zinc, regression coefficient = 0.1314,  $P = 0.0011$ ). **Discussion and Conclusions:** Our results suggest that ratio of blood lead as a biomarker of environmental lead exposure and dietary zinc intake play a role on the regulation of the level of MDA, an indicator of oxidative stress.