

# THE ROLE OF GENDER IN INORGANIC ARSENIC INDUCED OXIDATIVE STRESS AMONG BANGLADESHI POPULATION EXPOSED TO HIGH ARSENIC THROUGH DRINKING WATER

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**Background:** Arsenic acts as a carcinogen may be due to oxidative stress induction through the generation of reactive oxygen species (ROS). Gender disparity has been reported in many arsenic-exposure related diseases like cardiovascular diseases, hypertension, liver diseases, as well as skin lesions or cancers. However, no study had been reported about gender disparity in arsenic induced oxidative stress in Bangladeshi arsenic-exposed population.

**Objective:** The objectives of the study are to examine the levels of urinary 8-OHdG and F2 $\alpha$  –isoprostane, two established oxidative stress biomarkers, in relation to the urinary arsenic within Bangladeshi arsenic-exposed men and women.

**Methods:** Data were obtained from 219 healthy participants, aged 18-45 years, from two communities of southern-west part of Bangladesh in August 2009. One hundred four participants were participated from high arsenic- contaminated area and other 115 participants from arsenic free area.

**Results:** Urinary arsenic was positively associated with oxidative biomarkers-namely 8-OHdG and F2 $\alpha$ -isoprostane ( $r=0.59$ ,  $p<0.001$  and  $r=0.43$ ,  $p<0.001$ , respectively). The exposed group showed higher urinary arsenic (Geometric mean 166  $\mu\text{g/g Cr}$  95% CI 102.8-230.9) than the non-exposed group (Geometric mean 54  $\mu\text{g/g Cr}$ , 95% CI 38.8-70.9). Higher 8-OHdG level was found in As-exposed group (Geometric mean 8.4 ng/mg Cr, 95% CI 2.5-14.2 vs Geometric mean 6.5 ng/mg Cr, 95% CI 3.9-9.6) than in non-exposed group, but result was different for F2 $\alpha$ -isoprostane (Geometric mean 5.5 ng/mg Cr, 95% CI 4.1-6.9 vs Geometric mean 7.0 ng/mg Cr, 95% CI 2.8-11.2). Among arsenic-exposed subjects urinary arsenic and 8-OHdG levels were significantly lower ( $p<0.05$ ) in women than men. In case of F2 $\alpha$ -isoprostane, women have higher values than men within the non-exposed group, but no sex difference was found in As-exposed group.

**Conclusions:** The results suggest that oxidative DNA damage and lipid peroxidation were associated with arsenic exposure, which were sex-dependent to some extent.