[P-23]

# ARSENIC-INDUCED DYSFUNCTION IN RELAXATION OF BLOOD VESSELS

Moo-Yeol Lee, Byung-In Jung, Seung-Min Chung, Ok-Nam Bae and Jin-Ho Chung

College of Pharmacy, Seoul National University, Seoul 151-742, Korea

Several epidemiological studies have suggested that exposure to arsenic is strongly correlated with the development of cardiovascular diseases such as hypertension. To determine whether arsenic affects vasomotor tone in blood vessels, we investigated the effect of arsenic on vasorelaxation using isolated rat aortic rings in an organ bath system. Treatment with arsenite inhibited acetylcholine-induced relaxation of the aortic rings in a concentration-dependent manner, while several other arsenic species did not have any effect. Consistent with these findings, the levels of cGMP in the aortic rings were significantly reduced by arsenite treatment. In cultured human aortic endothelial cells, treatment with arsenite resulted in a concentration-dependent inhibition of endothelial nitric oxide synthase (eNOS). In addition, higher concentrations of arsenite decreased the relaxation induced by sodium nitroprusside (a NO donor) and 8-Br-cGMP (a cGMP analog) in aortic rings without endothelium. These in vitro results indicate that arsenite is capable of suppressing in blood vessels by inhibiting eNOS activity in endothelial cells and by impairing the relaxation machinery in smooth muscle cells. In vivo studies revealed that the reduction of blood pressure by acetylcholine infusion was significantly suppressed after arsenite was administered intravenously to rats. These data suggest that an impairment of vasomotor tone due to arsenite exposure may be a contributing factor in the development of cardiovascular disease.

Keyword : Arsenic, Arsenite, Blood Vessels, Nitric Oxide