Association of chronic arsenic exposure with the risk of diabetes and characteristic features of asthma

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Exposure to arsenic (As) is a major threat to the public health worldwide. Association of As exposure with neoplastic diseases has been well established. Mounting evidence suggest the involvement of As in non-neoplastic diseases. In our study, we explored the association of As exposure with the risk of diabetes and asthma recruiting human subjects from low and high As exposed areas in Bangladesh. We found that As exposure was dose-dependently associated with risk of hyperglycemia including IGT and DM. Females showed greater susceptibility to As exposure-related hyperglycemia than males. In a follow-up study, we found that chronic As exposure was inversely associated with serum creatinine levels. Serum creatinine levels directly reflect the skeletal muscle mass. Arsenic exposure-related increased blood glucose levels were inversely associated with serum creatinine levels suggesting that decreasing skeletal muscle mass may be a potential mechanism of As-related diabetes. In another study, we found that As exposure associated with the risk of the reversibility in airway obstruction and asthma-like symptoms, the two important characteristic features of asthma. Subjects’ As exposure levels were also associated with the elevated levels of serum immunoglobulin E and Th2 cytokins. Arsenic exposure-related reversibility in airway obstruction, asthma-like symptoms and elevated levels of serum IgE and Th2 cytokines suggest that As-exposed people are susceptible to the allergic asthma. Taken together, our results show the risk and underlying mechanism of diabetes and asthma associated with chronic As exposure.