

BACKGROUND

In August 1999, we conducted a field analysis of the feasibility of conducting benzene epidemiology studies in Shanghai, China. As a result of our findings, we concluded that Shanghai offers significant advantages for the conduct of concurrent and prospective molecular and clinical epidemiology studies on benzene hematotoxicity. The original charge of the investigative team was to assess the feasibility of benzene studies in China, including population-based case control studies and molecular epidemiology studies. Formal feasibility criteria were evaluated in this regard, and both types of study were deemed feasible. Prior to the visit it was not envisioned that benzene-induced disease would still be prevalent, that relatively high exposures still existed or that access to work sites and patient records could be easily and reliably obtained. Our subsequent studies and publications of results on benzene exposure in Shanghai, China, indicate that it is feasible to continue and bring to a successful conclusion concurrent and prospective molecular and clinical epidemiology studies of benzene toxicity in Shanghai, China.

Occupational Exposure to Benzene in Shanghai

Shanghai possesses an industry base that still experiences relatively high benzene exposure. This contrasts with recent NCI reports that conclude cumulative occupational exposure to benzene in China is generally less than 10 ppm/yr^{1,2}. Several industrial segments continue to conduct operations that result in high benzene exposure for some workers, and some of these industries have operations essentially free of complex or confounding occupational exposures. Many of these factories also have long-term and detailed health and environmental records. A recent review of the 1999 benzene monitoring databases of the Shanghai Municipal Centre for Disease Control and Prevention (SMCDCP) and the Institute for Public Health Supervision (IPHS) revealed some factories in which area airborne benzene concentrations could be expected to result in biological effects in exposed workers. These results comport with personal observations we made during our visit to some of these same facilities in August of 1999. A follow-up analysis of SMCDCP monitoring records revealed 30 factories with measurements exceeding 12.5 ppm in 2000. Spot measurements conducted using a selective benzene monitor confirmed some exposures in the range of 30-140 ppm. Results we have obtained and published over the past 5 years reveal significant occupational exposure to benzene for certain workers at even higher levels. Chinese authorities are acting to remediate benzene exposure conditions in a wide range of industries, and the situation with respect to occupational exposure to benzene is in a state of change.

The Shanghai Study Environment

The Shanghai area has a population base of approximately 23 million people. The prevalence of new cases of hematopoietic disorders presenting annually at Shanghai hospitals generally exceeds those originally predicted at the beginning of this study: (e.g. Aplastic anemia (AA): 50; Myelodysplastic syndrome (MDS) : 60; and Acute myelogenous leukemia (AML): 120. In addition, there are additional cases of mild AA and MDS that are seen in central hospitals as outpatients.