

Lack of Predictive Value of Provoked Urine Test Results in the Determination of Toxic Exposures

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Provoked urine testing (PUT) involves the determination of urine metal concentrations following chelator administration. Because it is likely that such testing may cause urinary excretion of metals to increase beyond reference ranges, even in the absence of significant exposures, such testing is considered to be an invalid predictor of metal toxicity. Nevertheless, PUT is widely utilized by some practitioners, and patients with results indicating urinary metal concentrations exceeding reference ranges may present to clinical practices for evaluation for possible metal toxicity. Interpretation of such testing results is hampered by a lack of data assessing the predictive value of PUT results for the diagnosis of metal toxicity. This presentation summarizes the results of a prospective assessment of the utility of PUT in predicting the likelihood of metal toxicity as assessed by medical toxicologists. The Toxicology Investigators Consortium (Toxic), a prospective study of all cases treated at the bedside or in a clinic by medical toxicologists, collects data on patients presenting to medical toxicology clinics with PUT since 2012. After toxicologic evaluation, medical toxicologists assessed whether each patient's presentation represented a true toxic exposure. Between 2012 and 2017, 106 patients presented with PUT data to medical toxicology clinics participating in Toxic. Thirty-two patients were excluded because a formal determination of whether they had a toxic syndrome was not made. Of the remaining 74 patients, 16 were determined to have signs or symptoms related to a toxic exposure. However, for 13 of these patients, the exposure was to a substance not implicated by their PUT. Only three patients were determined to have metal-related toxicity. All three had syndromes related to mercury exposure. The positive predicted value of PUT for the determination of metal toxicity was 4%. Based on these data, PUT is a highly unreliable predictor of toxic metal exposures.