

Wagner, Glenn  
From: Centeno, Jose A. Ph.D. [Jose.Centeno@afip.osd.mil]  
Sent: Monday, February 14, 2005 3:49 PM  
To: Wagner, Glenn  
Cc: apoklis@vcu.edu  
Subject: RE: Arsenic levels-Todd Sommers (A02-13, AFIP #2817873)

Dear Glenn:

It is good to hear from you. I hope you and your family are doing fine in sunny San Diego.

I remember this case very well. When we conducted the initial analyses back on May 2003, we were surprised by the high arsenic levels in the liver, kidney, blood and moderately high in the urine. I initially thought that the tissue samples were contaminated during collection, so the measurements were conducted several times during different days using different areas of the tissues, and they came up high every time. We also conducted arsenic analysis on other tissue made available to us at a later date, including brain and muscle. In this case, the brain levels were considered to be within "acceptable" published levels, but the muscle came up high. We also did hair analysis (made available to us in September 2003), and these hair analyses came up "normal".

In cases of chronic arsenic poisoning like what you see with people chronically exposed to arsenic from contaminated drinking water, arsenic levels in the urine are routinely high (50-150 ppb), and the hair arsenic may reach ppm levels. For acute chronic exposure, hair arsenic may not reflect the exposure level.

I don't have a good interpretation of these results, but the persistently high tissue levels as well as the moderately high urine levels suggest an acute arsenic poisoning case. Speciation studies may be used to support this observation, as these type of analyses may show more inorganic arsenic in the urine than organic arsenic or methylated arsenic; however, because of the way in which the tissues and fluids were received in my lab, we were not able to do speciation studies on any of the samples.

We also conducted arsenic analysis on a series of over the counter medications that the patient was apparently taken. Interesting enough we found arsenic levels in some of the medications that were provided to us such as loperamide (18 ppb), acetoaminophen (2.8 ppb) and promethazine (4.4 ppb). I don't know if these levels are considered "background" levels on these medications (as contaminants from the manufacturing process?); however, I tried to get some information through the FDA on the chemical trace element analyses of these drugs but I was not that successful on my search. I did pass all this information to the Special Agent who was working on this case at that time.

In summary, the levels of arsenic in these tissues (after taken into consideration potential exogenous sources of contamination) were found to be abnormal. The interpretation was not as straight forward since we lack exposure information and speciation studies. Perhaps, a literature search may help in looking at similar cases in the published literature.

As always, if I can be of any assistance, please do not hesitate to contact me at any time.

All the best,

Jose