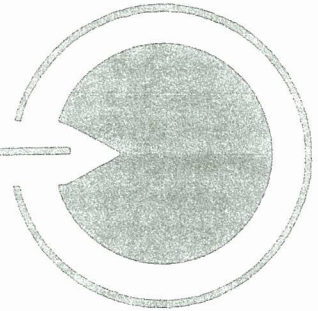


BIO-PROBE

NEWSLETTER



Volume 5

January 1988

Issue 1

VALIDITY OF HAIR ANALYSIS FOR DIAGNOSIS OF MERCURY STATUS

by
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In recent years, the value of measurements of mercury in blood and urine has been subjected to a great deal of attention and controversy. Defenders of the use of dental mercury fillings claim that low urine and blood mercury values prove that the fillings are harmless, even though the American Dental Association and the National Institute of Dental Research have publically admitted that there is no correlation between the toxic effects of mercury and the levels of mercury found in the urine and blood.(1,2) As early as 1964 Goldwater and associates stated that "those investigators who have studied the subject are in almost unanimous agreement that there is poor correlation between the urinary excretion of mercury and the occurrence of demonstrable evidence of poisoning".(3) This position has been thoroughly reinforced through the years with documentation and expert opinion.

The same can be said for blood mercury levels related to exposure to mercury vapor, although there is some validity related to recent exposure to ingested organic and inorganic mercury compounds. Magos, summarizing the research done by himself and a number of others, pointed out that inhaled mercury vapor

passes from the blood into body tissues very rapidly after exposure.(4) Blood mercury measurements would therefore have to be performed immediately after exposure to reflect increased levels resulting from inhalation of mercury vapor.

Relation of measured levels of mercury in the urine and blood to "normal" values presents another falacy, since the so-called "normal" values were derived from population groups heavily infested with mercury dental fillings. Valid comparisons would require relating to control groups not possessing the influencing factor being investigated. It would seem that the only *experts* that value urine and blood mercury measurements have not troubled themselves with scientific documentation or support, namely, the defenders of dental mercury fillings.

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The analysis of hair for mercury levels is another story. Although the ADA and the NIDR place little value on hair mercury analysis (1), the U.S. Environmental Protection Agency (EPA) offers a different position. In a document reviewing over 130 references, the EPA states "human hair is a meaningful and representative tissue for antimony, arsenic, cadmium, chromium, copper, lead, mercury,..."(5) The EPA also stated that "for measurement of levels of toxic metals for long periods or especially of exposure to a dangerously high level during a past period, hair appears to be superior to blood and urine for certain toxic elements concentrated in the hair."(5) In another EPA document, Jenkins reported that "of the 14 trace elements considered in this report, human hair is excellent for biological monitoring of arsenic, cadmium, chromium, lead and mercury."(6)

In 1983, Airey reviewed 113 references and concluded "mercury is deposited in the hair as it grows, and the amount deposited reflects the body burden of mercury."(7) Airey also stated "this increased concern about the health of persons exposed to very low environmental mercury concentrations is because mercury causes subclinical effects at low concentrations. The symptoms are difficult to detect and measure. For example, slightly increased levels of mercury in hair have been associated with decreases in academic ability. Also, reduced productivity and development of asthenic vegetive syndrome, a subtle behavior change, can occur".(7)

Manson and Zlotkin, in a 1985 article printed in the *Canadian Medical Association Journal*, stated that "the analysis of hair for trace elements is potentially a safe, noninvasive and extremely useful diagnostic tool, but it has not yet been proven to be reliable or to reflect the status of trace elements elsewhere in the body. As well, little is known about the normal ranges of concentrations of elements in the hair or about the physiologic and pharmacologic factors that affect the concentrations."(8)

The opinion of Manson and Zlotkin differs from that of Airey and the EPA, so examination of the available data may be helpful towards resolution of the dilemma.

PROBLEMS WITH ANALYSIS

In 1985, Barrett sent hair samples from two healthy teenagers to thirteen commercial laboratories performing multimineral hair analysis.(9) The reported levels of most minerals varied considerably between identical samples sent to the same laboratory and from laboratory to laboratory. Barrett concluded that "commercial use of hair analysis in this manner is unscientific, economically wasteful, and probably illegal."

Although Barrett's findings are certainly worthy of consideration, his conclusions are overly dramatic, if not downright inflammatory. Schoenthaler capably addressed Barrett's data and conclusions.(10) Schoenthaler pointed out that the results were severely biased by the obvious ineptitude of a few of the labs, an unfortunate circumstance that has been demonstrated in the analysis performance on other widely accepted medical tests. The majority of labs were in statistical agreement on the analysis.

What Dr. Barrett failed to do was to draw some relationship of the validity of hair analysis in relation to the validity of the millions of blood tests ordered by physicians annually. Accordingly, and to place "the other side of the coin" in proper perspective, let's look at an astounding example.

The College of American Pathologists (CAP) conducts inter-laboratory comparisons of laboratories that do analysis (blood, urine, etc.) for hospitals and physicians. In their 1985 survey, 5000 laboratories were given identical blood samples to analyze; nearly 50% produced unacceptable results.(11) How many erroneous diagnostic decisions, possibly resulting in unnecessary treatment, are based on flawed and incorrect blood analysis? Does Dr. Barrett consider these analyses "unscientific, economically wasteful, and probably illegal"? It appears that Dr. Barrett is recommending throwing out the baby with the bath water.