Assessment of commercial laboratories performing hair mineral analysis.

Seidel S, Kreutzer R, Smith D, McNeel S, Gilliss D.

California Department of Health Services, Environmental Health Investigations Branch, 1515 Clay St, Suite 1700, Oakland, CA 94612, USA.

CONTEXT: Hair mineral analysis is being used by health care practitioners and promoted by laboratories as a clinical assessment tool and to identify toxic exposures, despite a 1985 study that found poor reliability for this test.

OBJECTIVE: To assess whether the reliability of data from commercial laboratories advertising multiminerual hair analyses for nutritional or toxicity assessment has improved since the 1985 study.

DESIGN, SETTING, AND PARTICIPANTS: A split hair sample taken from near the scalp of a single healthy volunteer was submitted for analysis to 6 commercial US laboratories, which analyze 90% of samples submitted for mineral analysis in the United States.

MAIN OUTCOME MEASURES: Agreement of test results for each analyte, laboratory reference ranges, laboratory characteristics, and interpretation of health implications.

RESULTS: Laboratory differences in highest and lowest reported mineral concentrations for the split sample exceeded 10-fold for 12 minerals, and statistically significant (P<.05) extreme values were reported for 14 of the 31 minerals that were analyzed by 3 or more laboratories. Variations also were found in laboratory sample preparation methods and calibration standards. Laboratory designations of normal reference ranges varied greatly, resulting in conflicting classifications (high, normal, or low) of nearly all analyzed minerals. Laboratories also provided conflicting dietary and nutritional supplement recommendations based on their results.

CONCLUSIONS: Hair mineral analysis from these laboratories was unreliable, and we recommend that health care practitioners refrain from using such analyses to assess individual nutritional status or suspected environmental exposures. Problems with the regulation and certification of these laboratories also should be addressed.

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