

# The use of urinary porphyrins analysis in autism

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## **Abstract**

The analysis of urinary porphyrins promises to provide substantial insight into treating autism. Previous methods to determine body burden of toxic metals relied on a chelation challenge. However, the urine porphyrins test is more effective than a chelation challenge in determining toxic metal body burden because it measures the effects of those metals on the body. Specifically, certain metals, particularly toxic metals such as mercury, lead, and arsenic, inhibit different enzymes in the porphyrin pathway for the synthesis of heme and, thus, cause different and specific porphyrin patterns (or “profiles”) in the urine, the analysis of which can help determine which metal is involved, and to what degree. The higher the toxic metal exposure and body burden, the higher the porphyrins are elevated in the urine. In humans, certain urinary porphyrin profiles appear to directly reflect mercury body burden and neurobehavioral deficits.

This article reviews one recent prospective study of 115 children with autism who demonstrated porphyrinuria when compared to 119 control children, including a mean increase of 2.6-fold ( $p < 0.001$ ) in coproporphyrin. The elevation in coproporphyrin also correlated with the severity of autism and was consistent with mercury exposure and burden. A subgroup of these autistic children underwent oral chelation therapy with meso-2,3-dimercaptosuccinic acid (DMSA), which resulted in a significant reduction in mean urinary coproporphyrin and precoproporphyrin ( $p = 0.002$ ). Another prospective study on 37 autistic patients confirmed that the severity of autism was directly correlated to the degree of porphyrinuria. The interpretation of the urinary porphyrin profile is reviewed, as are important differences found in males versus females.

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