



PATIENT: Number 742
 SEX: Male
 AGE: 2

Toxic & Essential Elements; Hair

TOXIC METALS			
	RESULT µg/g	REFERENCE INTERVAL	PERCENTILE 68 th 95 th
Aluminum (Al)	4.5	< 8.0	
Antimony (Sb)	0.084	< 0.066	
Arsenic (As)	0.12	< 0.080	
Barium (Ba)	0.90	< 0.50	
Beryllium (Be)	< 0.01	< 0.020	
Bismuth (Bi)	0.004	< 2.0	
Cadmium (Cd)	0.26	< 0.070	
Lead (Pb)	6.8	< 1.0	
Mercury (Hg)	0.15	< 0.40	
Platinum (Pt)	< 0.003	< 0.005	
Thallium (Tl)	0.001	< 0.002	
Thorium (Th)	0.001	< 0.002	
Uranium (U)	0.021	< 0.060	
Nickel (Ni)	0.09	< 0.20	
Silver (Ag)	0.18	< 0.20	
Tin (Sn)	0.84	< 0.30	
Titanium (Ti)	0.23	< 1.0	
Total Toxic Representation			

ESSENTIAL AND OTHER ELEMENTS					
	RESULT µg/g	REFERENCE INTERVAL	PERCENTILE 2.5 th 16 th 50 th 84 th 97.5 th		
Calcium (Ca)	538	125- 370			
Magnesium (Mg)	47	12- 30			
Sodium (Na)	280	20- 200			
Potassium (K)	79	12- 200			
Copper (Cu)	9.0	11- 18			
Zinc (Zn)	140	100- 190			
Manganese (Mn)	1.1	0.10- 0.50			
Chromium (Cr)	0.49	0.43- 0.80			
Vanadium (V)	0.12	0.030- 0.10			
Molybdenum (Mo)	0.26	0.050- 0.13			
Boron (B)	5.7	0.70- 5.0			
Iodine (I)	0.63	0.25- 1.3			
Lithium (Li)	0.016	0.007- 0.020			
Phosphorus (P)	127	150- 220			
Selenium (Se)	0.77	0.70- 1.1			
Strontium (Sr)	2.1	0.16- 1.0			
Sulfur (S)	45600	45500- 53000			
Cobalt (Co)	0.009	0.004- 0.020			
Iron (Fe)	8.9	7.0- 16			
Germanium (Ge)	0.020	0.030- 0.040			
Rubidium (Rb)	0.12	0.016- 0.18			
Zirconium (Zr)	0.013	0.040- 1.0			

SPECIMEN DATA		RATIOS	
COMMENTS:		ELEMENTS	RATIOS
Date Collected: 02/07/2013		Ca/Mg	11.4
Date Received: 03/04/2013		Ca/P	4.24
Date Completed: 03/09/2013		Na/K	3.54
Methodology: ICP/MS		Zn/Cu	15.6
Sample Size: 0.197 g	Sample Type: Head	Zn/Cd	538
Hair Color: Brown	Treatment:		
Shampoo:			
		RANGE	
			4- 30
			0.8- 8
			0.5- 10
			4- 20
			> 800

u r i n a r y p o r p h y r i n p r o f i l e

(hplc fluo-uv detection)

u r i n a r y p o r p h y r i n s n m o l / g r C r

			ref. range (m+/-2sd)
uP	UROPORPHYRIN	42 nmol	12-24
7cXP	HEPTACARBOXYPORPHYRIN	8.4 nmol	3.1-5.7
6cXP	HEXACARBOXYPORPHYRIN	1.5 nmol	0.5-1.1
5cXP	PENTACARBOXYPORPHYRIN	8.3 nmol	3.2-5.0
pcP	PRECOPROPORPHYRIN	17 nmol	7-14
cP	COPROPORPHYRIN	365 nmol	110-220

significantly INCREASED TOTAL PORPHYRINURIA dominant at COPROPORPHYRIN.

ratios

			ref. range	
pcP/uP	PreCOP / URO	ratio	0.41	0.3-0.7
(5cP+pcP)	/ (uP+7cP)	ratio	0.5	0.3-0.6
pcP/5cP	PreCOP / 5CXP	ratio	2.1	1.5-3
pcP/cP	PreCOP / COP	ratio	4.8	2-6
cP/uP	URO / COP	ratio	8.5	6-9

ratios interpretation

PCP/URO

PRECOPRO normalized to UROPORPHYRIN which is unresponsive to mercury toxicity may bring out relative increase of this metabolite and constitute an index of mercury toxic effect

(5CXP+PCP)/(URO+7CXP)

This ratio highlights mercury specific URO-D site 4 in relation to other active sites providing additional index of specific mercury toxicity

PCP/COPRO

On the condition that Precoproporphyrin is increased, Precopro/Copro ratio may constitute a marker of heavy metals(mercury) toxicity, partly modulated by genetic factors.

urinary porphyrin profile in nanomoles / l of native urine

metabolites	URO	7CXP	6CXP	5CXP	PRECOPRO	COPRO
nmol/l urine	12.84	2.5	0.4	2.4	5	109

urinary porphyrin profile in percentage of total fluorescence

metabolites	URO	7CXP	6CXP	5CXP	PRECOPRO	COPRO
% fluor area	7.4	1.5	0.3	2.0	4.1	84.6

urinary creatinin 300 mg/l

urate / crea ratio 1.14 ref. val. 0.44-0.8 molar units

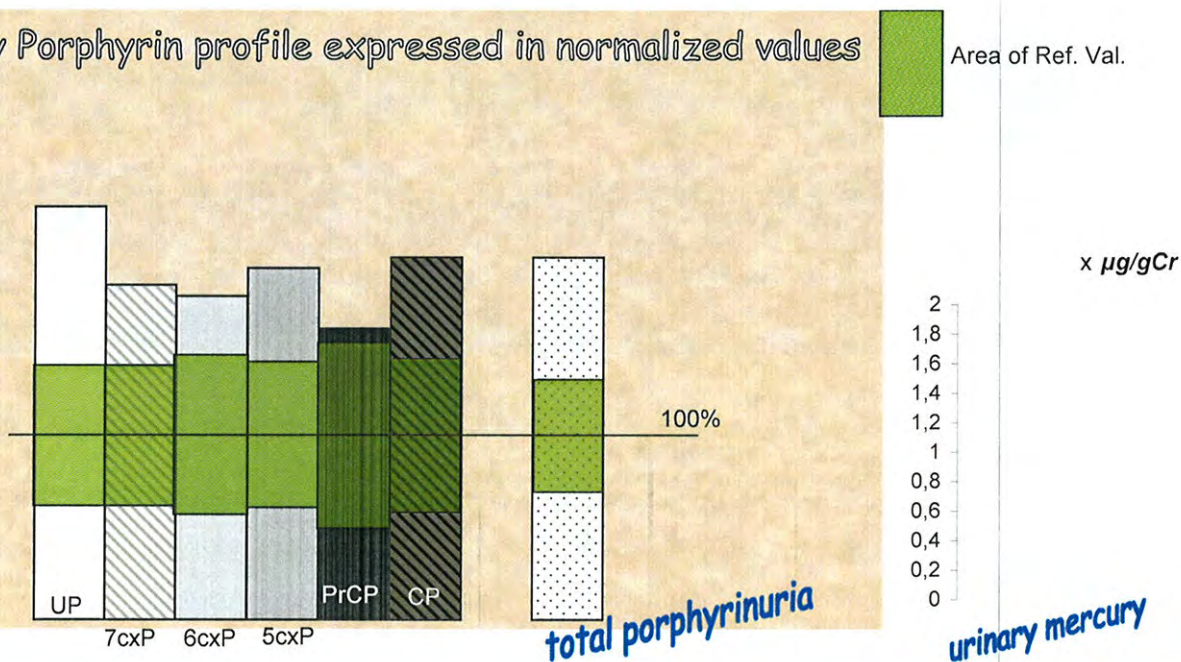
Urinary porphyrins

HPLC-UV+Fluorescence (nmol / l)

		nmol/l	nmol/gcr	Ref. Val. m±2sd
Uroporphyrins I & III	UP	13	43	12 - 24
Heptacarboxy porphyrin	7cxP	2,5	8,5	3,1-5,7
Hexacarboxy porphyrin	6cxP	0,45	1,5	0,5-1,1
Pentacarboxy porphyrin	5cxP	2,5	8,3	3,2-5,0
Precoproporphyrin	PrCP	5,3	18	7-14
Coproporphyrins I & III	CP	110	365	130-220
Total porphyrinuria			444	155-269

urinary creatinin 300 mg / l	PrCP/Up ratio	0,4	0,2-0,6
	PrCP/Cp	4,8	2-6
	Cp/Up	8,5	5-8

Urinary Porphyrin profile expressed in normalized values



A quantitative or qualitative changes in urinary porphyrins is associated with many environmental toxicants that it reflects the metabolic impact. It is advantageously associated with the urinary Porphyrin Profile, the determination of urinary 8-oxo-deoxyguanosine, reflecting a genotoxicity, enhanced by the majority of environmental toxicants, metals, organic compounds.

Increased initial metabolites, uroporphyrin & / or 7cxP, is associated with Xenobiotics, arsenic, aluminum.

Associated increase in terminal metabolites, 5cxP, Precopro & coproporphyrin is related to mercury.

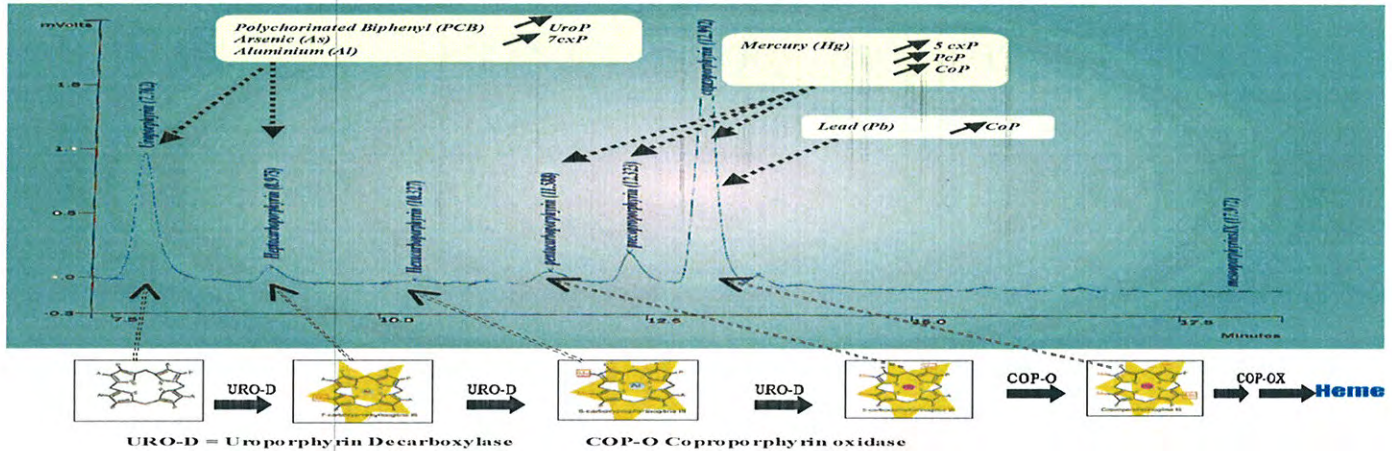
The isolated increase of coproporphyrin without changing any other component is associated with lead & / or xenobiotics.

The overall increase in porphyrinuria without changing the relative proportions of different metabolites is associated with xenobiotics.

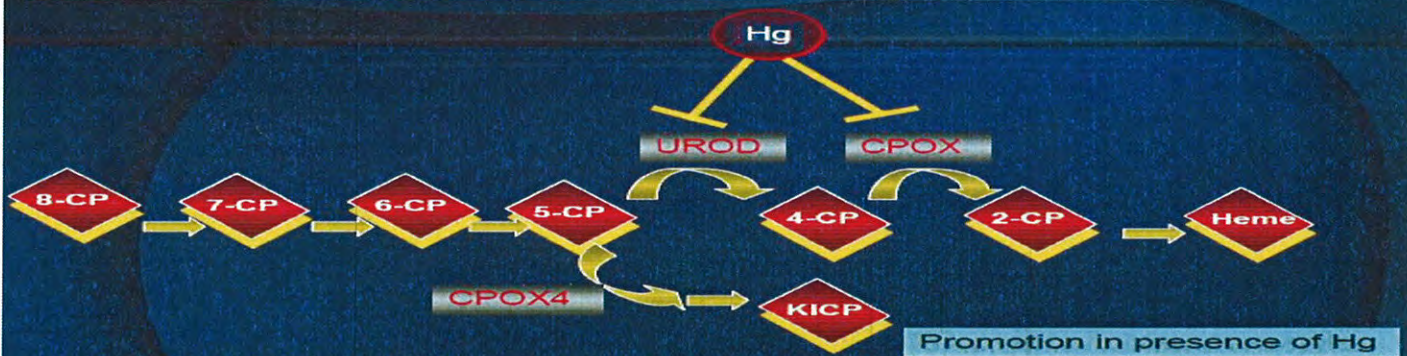
Urinary porphyrins (Heavy Metals Intoxication)



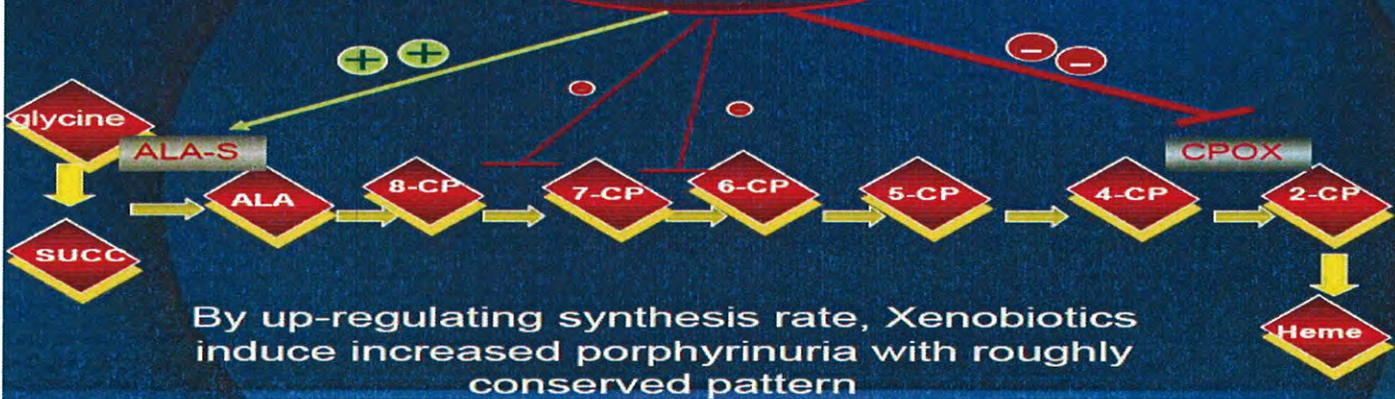
Toxic sensitivity of different porphyrins



Mercury targets CPOX and UROD in Heme biosynthetic pathway



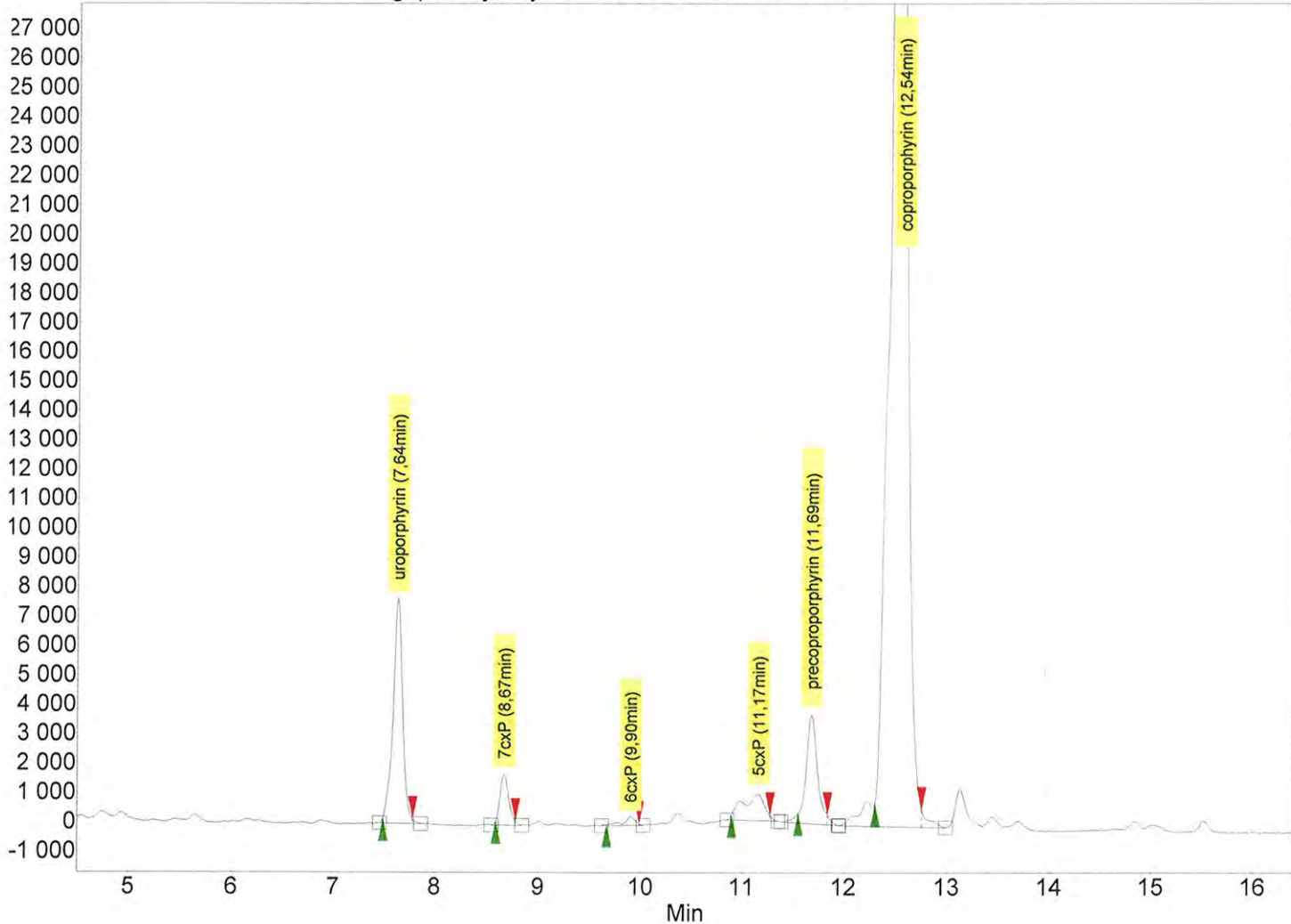
Xenobiotics



References:

- 1) Fowler BA, Porphyrinurias induced by mercury and other metals, *Toxicol Sci* [05/2001] 61(2):197-8.
- 2) Pingree SD, Simmonds PL, Rummel KT, Woods JS, Quantitative evaluation of urinary porphyrins as a measure of kidney mercury content and mercury body burden during prolonged methylmercury exposure in rats, *Toxicol Sci* [05/2001] 61(2):234-40.
- 3) Apostoli M, Sarnico M, Bavazzano P, Bartoli D, Arsenic and porphyrins, *American Journal of Industrial Medicine* 42:180-187 (2002)
- 4) A cascade analysis of the interaction of mercury and coproporphyrinogen oxidase (CPOX) polymorphism on the heme biosynthetic pathway and porphyrin production., *Toxicol Lett* Oct/2005.
- 5) The association between genetic polymorphisms of coproporphyrinogen oxidase and an atypical porphyrinogenic response to mercury exposure in humans. *Toxicol Appl Pharmacol* Aug/2005 206(2):113-20.
- 6) Validity of spot urine samples as a surrogate measure of 24-hour porphyrin excretion rates. Evaluation of diurnal variations in porphyrin, mercury, and creatinine concentrations among subjects with very low occupational mercury exposure. *J Occup Environ Med* Dec/1999 40(12):1090-101
- 7) The validity of spot urine samples for low-level occupational mercury exposure assessment and relationship to porphyrin and creatinine excretion rates. *J Pharmacol Exp Ther* Apr/1996 277(1):239-44.
- 8) Altered porphyrin metabolism as a biomarker of mercury exposure and toxicity. *Can J Physiol Pharmacol* Feb/1997 74(2):210-5.
- 9) Behavioral effects of low-level exposure to elemental Hg among dentists. *Neurotoxicol Teratol* /1995 17(2):161-8.
- 10) Porphyrinuria in childhood autistic disorders; implications of environmental toxicity.

"Toxicology and Applied Pharmacology"



Name	Quantity [nmol/l]	Quantity /gr Cr [nmol/gr]	Area % [%]	Time [Min]
uroporphyrin	12,84	42,79	7,4	7,64
7cxP	2,54	8,48	1,5	8,67
6cxP	0,45	1,49	0,3	9,90
5cxP	2,49	8,30	2,0	11,17
precoproporphyrin	5,28	17,60	4,1	11,69
coproporphyrin	109,53	365,11	84,6	12,54
Total	133,13	443,76	100,0	

Reference (nmol/gr Cr)
UP : 8 - 20
7cxP : 2,5 - 4,5
6cxP : 0,5 - 1,5
5 cxP : 2 - 4
PrCP : 5 - 9
CP : 100 - 200 (child)
CP : 70 - 140 (adult)

Ratios :

PrCP / UP	0,41
5cxP+PrCP / UP+7cxP	0,51
PrCP / 5cxP	2,12
PrCP / CP	4,8
5cxP/7cxP	0,98
CP / UP	8,5

Reference Range :

0,2 - 0,5
0,2 - 0,6
1,5 - 3,0
2 - 6 %
< 1,0
5 - 9

urinary creatinin
300 mg/l

Health history for hair test 742

I have a son who is 2 y 11 months old and diagnosed on spectrum. I have got the DDI Hair test and Urine porphyrine test done for him. I am sending you the reports in this mail.

I request you to kindly analyze these reports and let me know what I can do next to help him recover. Also please find the information requested by you.

1. What are your current symptoms and health history?

Answer : Normal full term delivery. Met all milestones at time. Regressed after an viral stomach infection at the age of 1 year 3 months. Diagnosed on Autism spectrum at 2 years age.

2. Dental history (Wisdom teeth removed and when? Any other extractions. First root canal placed? Braces? First amalgam etc...)

Answer : Mother carried Amalgams in the mouth during pregnancy and breast feeding

3. What dental work do you currently have in place? What part of the dental clean-up have you completed?

Answer : not applicable

4. What dentistry did your mother have at any time before or during pregnancy?

Answer : Mother had amalgams in the mouth to fill dental cavities

5. What vaccinations have you had and when (including flu and especially travel shots)?

Answer : Had all the required vaccinations including flu shots before 1.5 years of age. Also underwent an antibiotic course when caught a stomach infection at 1y 3 months old.

6. Supplements and medications (including dosages) taken at time of hair test, or for the 3-6 months before the sample was taken?

Answer : Taking following supplements for the past 6 months :

Cod Liver oil (Nordic natural) : 1 tsp

Vitamin C : 300 mg daily

Probiotics : Customs 50 billion cfu daily

Enzymes : Digest gold 1/2 cap with each meal

7. What is your age, height and weight?

Answer :

Age : 2 years 11 months

Height : normal (not checked)

Weight : 14 kgs

8 . Other information you feel may be relevant?

Answer : Attached Urine Porphyrine test report also. Kindly analyse that as well

9 .What is your location – city & country (so that we can learn where certain toxins are more prevalent).

Answer : Faridabad, INDIA