URINE CHALLENGE FOR TOXIC POLLUTANTS Why and what for?

by: E.Blaurock-Busch PhD

Toxic Exposure

The EPA (Environmental Protection Agency), defined toxic air pollutants as hazardous air pollutants that are known or suspected to cause cancer or other serious health effects, including birth defects, allergies, neuromuscular disorders, and cancer. EPA is required to control 187 hazardous air pollutants. Examples of toxic air pollutants include benzene, which is found in gasoline; perchlorethlyene, which is emitted from some dry cleaning facilities; and methylene chloride, which is used as a solvent and paint stripper by a number of industries.

Today's environment increasingly exposes people of all ages to toxic pollutants. Breathing contaminated air is not the only source of exposure. We eat contaminated food products, such as fish from contaminated waters; meat, milk, or eggs from animals that fed on contaminated plants; and fruits and vegetables grown in contaminated soil on which air toxics have been deposited. Drinking water and soil may be contaminated, and young children are especially vulnerable because they often ingest soil from their hands or from objects they place in their mouths. Cosmetics are an overlooked source. They may contain a considerable amount of metals and medicines such as vaccines contain preservatives such as mercury or aluminium.

The mercury-based preservative thiomersal is much debated. Thimerosal contains 49.6 percent elemental mercury by weight and is metabolized or degraded into ethylmercury and thiosalicylate. Mercury, or more precisely, ethylmercury, is the principle agent that kills contaminants. Unfortunately, mercury also kills much more than that. In 1999 studies began to surface showing that multi-dose vial vaccines, such as the MMR and hepatitis B vaccines, contained enough thimerosal to expose vaccinated children to 62.5 ug of mercury per visit to the pediatrician. This is one hundred times the dose considered safe by the Federal Environmental Protection Guidelines for infants! Worse yet, some infants will receive doses even higher; because thimerosal tends to settle in the vial. If it is not shaken up before being drawn, the first dose will contain low concentrations of mercury and the last dose will contain enormously high concentrations. Aluminum salts such as Aluminum hydroxide or Aluminum phosphate are frequently found in medicines and have been incorporated as adjuvants in vaccines licensed for use in the United States and elsewhere. While Thiomersal is being phased out in the production of childhood vaccinations, aluminum is used as a replacement preservative. Between 100mcg and 600+mcg aluminum can be found in one dose of vaccination, which means that babies who are immunized according to CDC recommendations, are injected with considerable amounts of aluminum during critical stages of development.

Once toxic air pollutants enter the body, some of the most persistent pollutants accumulate in body tissues. For example, aluminum, often argued as being harmless, is not totally harmless. While the risk of an acute intoxication is extremely low, overexposure has its risks.

Naturally found in food and water, ingested aluminum is readily excreted via the renal and digestive tract. When renal and digestive excretion is impaired, accumulation in body tissues results. Vaccination can increase that body burden significantly, because unusually high amounts of aluminum are circulating in the bloodstream and are readily transported to various organ systems, including the CNS (central nervous system). Aluminum, like other toxic metals, causes oxidative stress within brain tissue. Since the elimination half-life of aluminum from the human brain is 7 years, this can result in cumulative damage via the element's interference with neurofilament axonal transport and neurofilament assembly. Some experts believe aluminum and other potentially toxic metals like mercury, even iron play a role in leading to the formation of Alzheimerlike neurofibrillary tangles. Aluminum like the heavy metal lead (Pb) has a direct effect on hematopoiesis. Excess aluminum has been shown to induce microcytic anemia. Daily injections of aluminum into rabbits produced severe anemia within 2-3 weeks. The findings were very similar to those found in patients suffering from lead poisoning.

This is only one example how a relatively harmless metal affects health. Multiple exposure to a variety of toxins has a significant impact on bodily systems.

Who is Exposed? Who is Considered Nonexposed?

Acute toxic exposure is generally seen in the occupationally exposed. For example: gold miners have a known

(Continued on page 82)

risk. Mercury is used to 'wash' gold and symptoms of acute mercury intoxication are not rare among them. Working with lead, arsenic or radioactive substances is also known to cause acute toxicities, but toxic exposure may also happen under *unexpected* circumstances such as during accidents in home, industry, or other places. The diagnosis of an acute intoxication is generally based on symptoms, blood and urine values that have risen far above the reference ranges.

While acute intoxications are relatively rare, chronic exposure affects each one of us. It is the rule rather than the exception and our lifestyle and environment are the cause. Toxins are found everywhere on this planet, from snow in the north pole to snow in the south pole, and no remote farm or village could possibly be toxin free. Exposure to multiple toxins affect us all, it is the sad and dangerous consequence of modern life.

A chronically exposed person may have symptoms 'of unknown cause' and routine blood and urine tests are within range. With those patients most physicians are literally 'in the dark'.

How Unexposed are the Nonexposed?

Micro Trace Minerals Laboratory (MTM) of Germany in cooperation with the University of Zurich analysed the blood of Rumanian school children. The study was headed by the university's toxicologist Margret Schlumpf PhD; analytical quality control and data evaluation was performed and supervised by the author (E.Blaurock-Busch) and Ing. A.Friedle.

Blood mineral analysis is a reflection of the amount of metals circulating in the blood stream. To avoid false positive results, certified metal-free blood tubes were utilized (as is the rule at MTM). While none of the children were considered 'exposed', blood mineral analysis indicated that in some of the tested multiple metal exposure is a serious threat. This can be seen in tables 1-3.

Blood levels for aluminum, lead and mercury are clearly above the CDC reference range for one school (Dr.Petcu of Pantelimon), and in these children growth and learning problems were most obvious.

What Can be Done?

Metals circulating in blood will be excreted within 72 hrs, or be deposited in in tissues such as brain, bone, spleen, liver, etc. and potentially cause harm. Young patients are most vulnerable.

Heavy toxic metals interfere with body functions in many ways, blocking enzyme and metabolic reactions, creating inflammation, damaging nerve and brain function, impairing immune functions, encouraging the development of cancers and so on. To restore normal

Table 1:

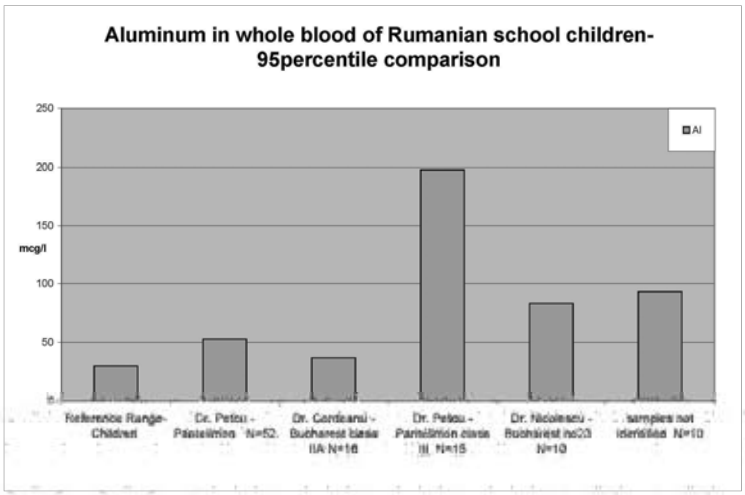


Table 2:

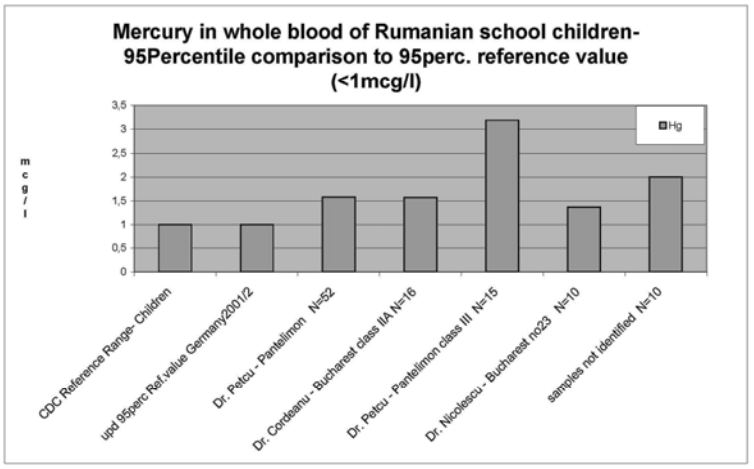
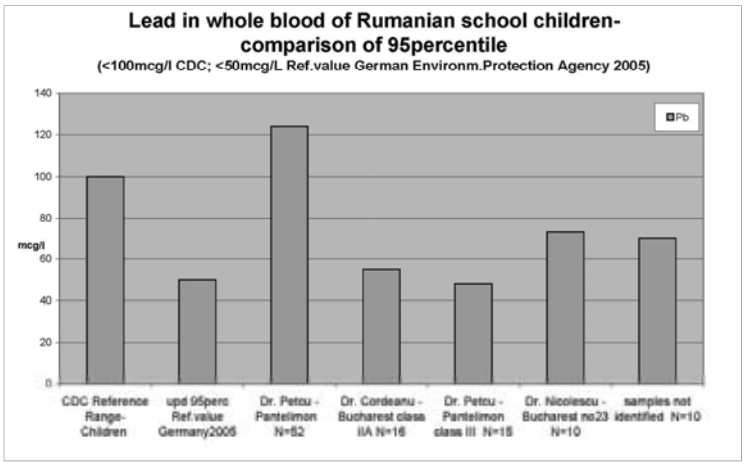


Table 3:



(Continued on page 84)

system functions, it is essential to reduce the total body burden.

Metal chelation has been practiced in occupational and environmental medicine for decades. Chelating agents such as DMSA are given orally to bind toxic metals. By doing this, we *challenge* the body by forcing toxic metal binding and these chemically bound metals are then excreted with urine and feces where they can be measured.

Urine challenge tests are easy. We distinguish between the baseline urine test and the challenge test. By comparing baseline urine concentrations with urine challenge concentrations, we not only prove treatment effectiveness, we receive information on the severity of the patient's metal intoxication.

DMSA Chelation

In 1991, the FDA (Federal Drug Administration) approved DMSA(DiMercaptoSuccinicAcid) as a chelating agent for lead in children. This chelating substance is considered safe and Poison Centers around the world recommend it for the treatment of metal intoxication. The German environmental agency (Umweltbundesamt) considers DMSA and DMPS as the most useful chelating agents available.

DMSA is a nontoxic oral chelating agent. It binds with heavy metals and removes them through the bloodstream, the renal and digestive tract. DMSA crosses the brain blood barrier removing mercury, lead, aluminium, cadmium, arsenic, mercury and nickel. It detoxifies hypothalamus and pituitary. DMSA also binds iron, manganese, silver, and tin. It also binds copper and zinc, but a lot less than DMPS does.

Precautions

Pregnant or lactating women and patients with kidney disorders should not be chelated unless medically warranted. Highly allergic patients should be challenged with a very small amount before DMSA detoxification is considered.

Side Effects

Patients who heavily detoxify may experience weakness during the first sessions of chelation. Most 'toxic' patients experience an 'emptiness in the head' and have difficulty concentrating. Some notice a slight decrease in vision ability, which will be gone the next day. It is assumed that this is due to DMSA's affect on the CNS. It has also been noticed that intestinal cramping does not occur in patients who have been 'prepared' with digestive cleaning methods prior to oral chelation.

Protocol for the Toxic Metal Challenge Test with DMSA

Baseline Urine

Under normal conditions, a baseline urine test shows urine metal concentrations that are either within, or slightly outside the reference ranges. A baseline urine test is best taken before the first treatment. We recommend that the patient stops eating fish for three days prior to collecting the urine, because fish may contain high amounts of arsenic or mercury. It is also recommended to stop smoking and to stop nutritional supplementation the day before urine collection takes place.

It is best to collect the first morning urine, preferably directly in a small urine container to avoid contamination. From that specimen 10 ml of urine are decanted in a tube provided by the lab. (Contact MTM for test kits.)

Preferably 3 days before the test, the patient should not consume fish, seaweed or algae products. The patient should not smoke after 10PM the night before the test.

Challenge Test

Depending on exposure and patient constitution, recommendation is 10 and 30mg/kg body weight on an empty stomach. It is preferable not to eat for two hours following intake.

DMSA should be taken with 1 glass of water on an empty stomach. Intake can be in the morning after rising, or the patient can be woken at 3AM to take his recommended dose of DMSA with one glass of water and go back to sleep. This is particularly useful for children.

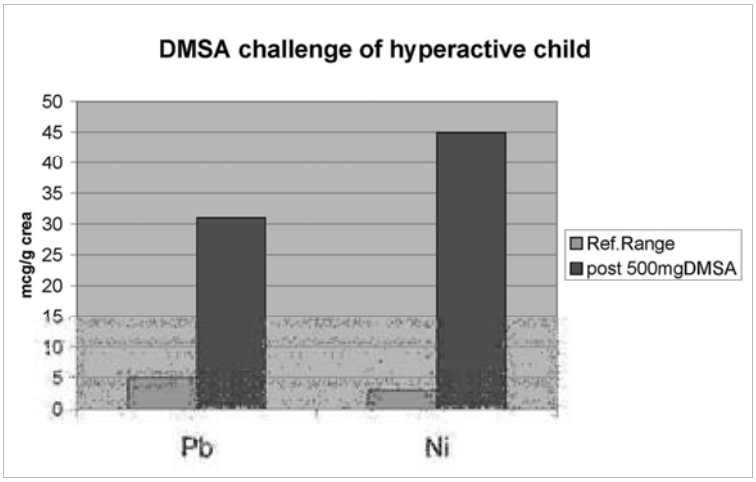
The urine is collected after 3-4 hrs during which a total of 2-3 glasses of water is consumed. Tea or coffee should be avoided. Tea may contain high amounts of manganese, coffee is rich in magnesium and other metals- all of which would easily bound by the chelating substance.

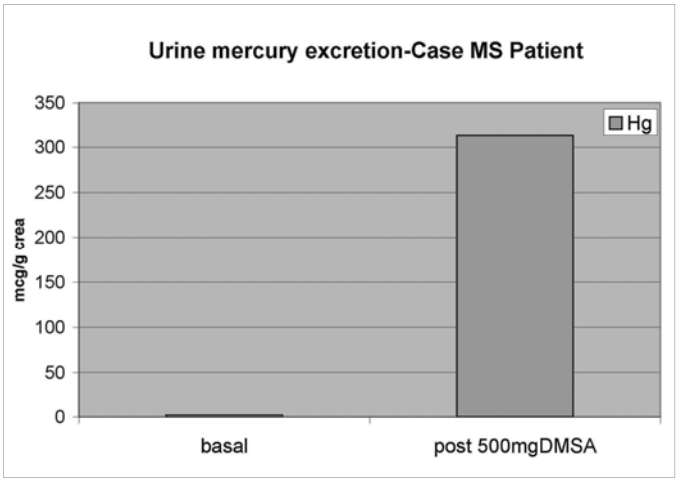
Effectiveness of DMSA Metal Chelation

Patient Case: Spasm and Hyperactiviy

Hyperactive year-old boy with periods of severe muscle spasm and allergic tendency was challenged with 500mg DMSA. Nutritional intervention improved spastic severity but did not markedly relieve hyperactivity. The boy lives with smoking parents in an industrial area. The challenge test shows a distinct increase in metal excretion following the challenge test.

(Continued on next page)





Patient Case: Multiple Sclerosis

56yr old female, diagnosed with MS at age 41. Severely handicapped, but refused the use of corticosteroids and interferon treatment. Lifestyle changes improved her mobility, and she was able to function without a wheelchair. A one-time DMSA challenge showed a urine mercury excretion level of over 300mcg/g creatinine. She continued DMSA chelation on a by-weekly schedule, a nutritional regimen was initiated to support detoxification, and within a year, the patient returned to near normal function.

About the author:

E.Blaurock-Busch PhD is scientific director at the German laboratory Micro Trace Minerals, Hersbruck, Germany and Boulder, Colorado. She is advisor to the scientific board of IBCMT (International Board of Clinical Metal Toxicology) and the German Medical Association for Metal Toxicology. She has written several books, numerous articles, and lectures worldwide. She can be reached at ebb@microtrace.de.Website www.microtrace.eu or www.microtraceminerals.com ◆