SEVERE MERCURY-POISINING OF A CHILD AND INVOLVEMENT OF THE WHOLE FAMILY

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Objective

Elemental mercury is well absorbed via inhalation with the risk of damage to the central and peripheral nervous system after chronic exposure.
We report a case of mercury-poisoning of a child with severe injury to the peripheral nerves. The involvement of the other family members is documented, as well.

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Patient: 13-**year-old boy**

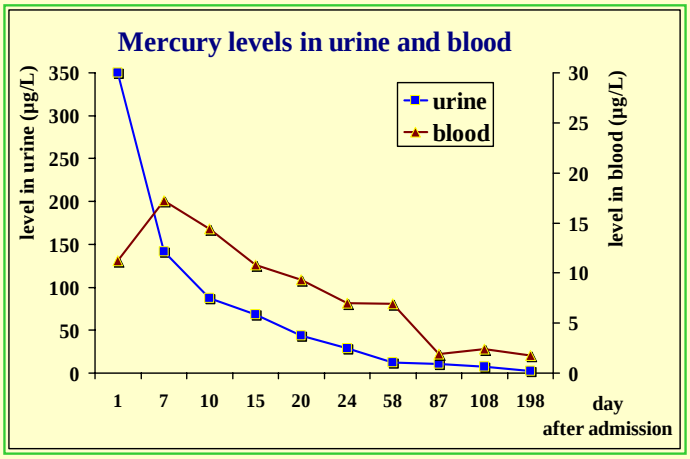
Route of exposure: He found a box containing metallic mercury in a brownfield and played with it at home for many days in November 2008.

Time of admission:

3 months after exposure in February 2009

Symptoms:

- backache, inappetence
- progressive leg emphasized weakness, hyporeflexia
- paresthesiae of the extremities
- nausea, headache
- psychological signs in terms of mood and behaviour



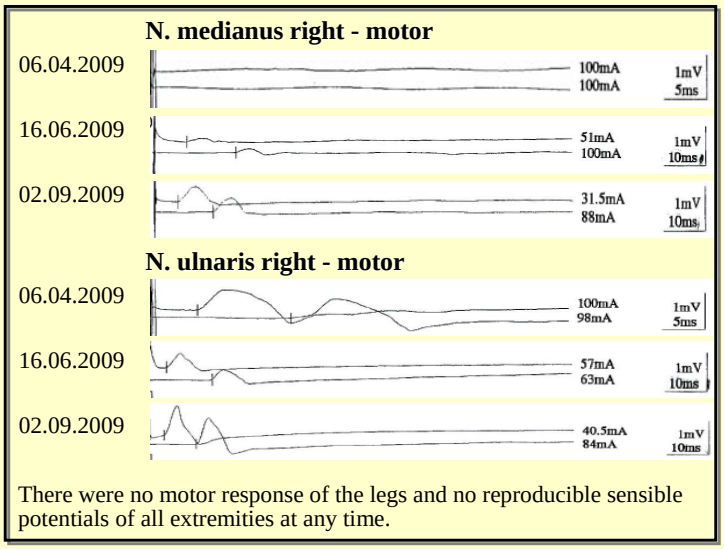
Findings of the Family members

	Age	Symptoms	Mercury levels in blood and urine (µg/L)	
brother	11	pallor, dizziness, nausea, headache	29	327
brother	15	no symptoms	26	270
father	39	dizziness, nausea, paresthesiae	25	174

All persons were treated with DMPS (Dimaval®).

Findings of electroneurography

Signs of **most severe axonal neuropathy** were seen in all examinations of electroneuromyography from February to September 2009, the remission was very slowly.



There were no motor response of the legs and no reproducible sensible potentials of all extremities at any time.

Treatment and course:

The boy was treated in hospitals (university and rehabilitation) till beginning of September 2009. During the DMPS-treatment for several months the mercury levels in urine and blood fell into normal range, but the severe neurological symptoms persisted nearly unchanged. Within 6 months he was able to go some meters and to write again.

Signs of mild nephropathy were seen in course. For further complications leucopenia, anemia and mild thrombocytopenia occurred in May 2009. Biopsy of the bone marrow showed unspecific myelosuppression. A specific cause could not be found.

Toxic range of mercury

- normal concentration - blood < 10 µg/L
- normal concentration - urine < 5 µg/L (persons without amalgam) or < 20 µg/L (persons with amalgam)
- toxic concentration - blood > 35 µg/L
- toxic concentration - urine > 100 µg/L

Conclusions

- The patient developed a severe secondary peripheral neuropathy, despite mercury levels in the lower toxic range.
- **DMPS-treatment** reduced the mercury level in a normal range during 10 weeks, but the neurological symptoms improved slowly over several months. Apparently, the storage of the heavy metal in the nervous system was complete at the time of diagnosis and it could not be mobilized sufficiently by the antidote.
- In contrast to the brothers, there was no increase of the mercury urine level at the start of therapy suggesting interindividual differences of mercury toxicokinetic by genetic polymorphisms (1).

References:
1. Gundacker C, Wittmann KJ, Kukuckova M et al. Genetic background of lead and mercury metabolism in a group of medical students in Austria. Environ Res. 2009, 109:786-96