A Forgotten Cause of Bilateral Wrist Drop

A 49-year-old nondiabetic and normotensive gentleman presented to the hospital with a progressive distal weakness of both upper limbs starting in the right upper limb for over a year at the time of presentation to the hospital that extended to the left hand after about 2–3 months. The patient had a past history of abdominal colic approximately two years before for which he underwent an exploratory laparotomy that was apparently normal.

Discussion

Lead (Pb) had a wide range of use in the industry due to its properties such as ease of casting and fabrication, resistance to corrosion and opacity to X-rays, and a low melting point.[1,2] It has gradually been replaced by other materials.

Pb is absorbed in the body from any route, respiratory tract and gastrointestinal tract (elemental and inorganic Pb), and even skin (organic Pb). It is distributed all over the body, especially in erythrocytes. A prolonged elimination of half-life (30 days in blood and 27 years in bone) resulted in increases in body levels with time. The distribution is present in three pools-blood and soft tissue (exchangeable pool and thus, the most important toxicologically), soft tissues, and a skeletal pool. It is excreted in urine and faeces (unabsorbed and from bile). The small amounts of Pb are also eliminated in other fluids, e.g., saliva, sweat, breast milk, etc.[2]

Robert Kehoe suggested that the blood Pb concentrations below 80 μg/dl might not cause the clinical Pb poisoning. The maximum blood concentration considered safe was, therefore, reduced to 80 μg/dl. Currently, considered safe levels were below 10 μg/dl. Nephrotoxicity (seen as proteinuria and low glomerular filtration rate) occurred with the blood Pb levels more than 50 μg/dl. Sperm abnormalities occurred over 40 μg/dl. Endocrine effects were evident beyond 60 μg/dl.[2] Delayed puberty occurred in girls.[3]

The International Agency for Research on Cancer determined that inorganic Pb compounds were carcinogenic to humans (Group 2A), and that organic Pb compounds were not classifiable regarding carcinogenicity to humans (Group 3).[4]

Pb accumulated until the critical body burdens were reached and then sudden onset, rapidly progressive symptoms developed. However, the subclinical presentations might occur early.

Pb could affect central, peripheral, and autonomic nervous system. The mild symptoms are characterized by fatigue and lethargy that could disturb the routine activities. Severe conditions such as encephalopathy, impaired consciousness, and bizarre neurological signs are unusual in adults but frequent in children due to pica.[5] The severity of symptoms ranged from confusion and disorientation to repeated resistant seizures, coma, and death. Lateralizing signs such as focal seizures, hemiparesis, and Babinski sign on one side might be seen as well.[6] Encephalopathy with headaches, excess salivation, vomiting, irritability, insomnia, delusions, and hallucinations might be seen.[7] Chronic exposure to Pb caused psychiatric symptoms and mild cognitive impairment.[5]

Neuropathy is usually asymmetrical and predominantly motor, rarely sensory. The weakness is more common in upper limbs than in lower limbs affecting the finger extensors followed by wrist extensors leading to "wrist drop." Weakness might also be seen in other muscles and even more proximal muscles. Similar weakness in the lower limbs causing "foot drop" might be seen in children.[5]

The patient was a factory worker in a battery manufacturing unit and had been exposed to Pb plates. The patient had held the job for the past 6–7 years.

Nerve conduction velocity showed changes in bilateral radial and medial nerves with the involvement of both the lower limbs. The laboratory investigations showed basophilic granules suggestive of Pb poisoning. The biochemical measurements for Pb estimation were available, and the levels were found to be high.

Pb poisoning was not a common condition seen any more. The usual presentation was a unilateral wrist drop. Our patient showed bilateral wrist drop. Sensory involvement, usually rare, was also seen in both the lower limbs. Pb should, therefore, be considered in a patient presenting with bilateral wrist drop.

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Conflicts of interest
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