



3-2018

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Recommended Citation

Shabbir, Ghulam; Jan, Zakir; and Rajput, Haris Majid (2018) "Bilateral wrist drop in a middle age man," *Pakistan Journal of Neurological Sciences (PJNS)*: Vol. 13 : Iss. 1 , Article 10.

Available at: <https://ecommons.aku.edu/pjns/vol13/iss1/10>

Bilateral Wrist Drop In A Middle Age Man

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Date of submission: October 11, 2017 Date of revision: November 22, 2017 Date of acceptance: December 28, 2017

ABSTRACT:

Peripheral neuropathy is a common disorder which often causes disability. Among metals lead intoxication leads to bilateral radial neuropathy. Patients with lead neuropathy present with weakness that primarily involves the wrist and finger extensors. Lead intoxication in humans causes axonal degeneration. We report a case of middle age male who presented with bilateral wrists drop, workup revealed that he had bilateral radial nerve neuropathy which was secondary to his occupational exposure to lead causing lead intoxication. Chronic lead exposure as a risk factor for neuropathy should be identified and treated promptly as its avoidance and treatment can save major disabilities.

KEY WORDS: Lead intoxication, Radial Neuropathy, Axonal Degeneration

INTRODUCTION:

Peripheral neuropathy is a common disorder which often causes disability. Radial neuropathy which can result from various condition results in wrist drop.[1] Commonly it is due to pressure palsies against a firm object with characteristic demyelinating findings on nerve conduction studies. Such conditions usually cause unilateral palsies.[2] The reasons for bilateral wrist drop include anterior horn cell disorders, vasculitis or metal toxicities. Among metals lead toxicity, although a rare cause, whenever present may cause bilateral wrist drop.[3] Neuropathy due to lead toxicity is usually asymmetrical and predominantly motor, but rarely sensory. It usually involves the upper limbs affecting finger extensors followed by wrist extensors leading to wrist drop.[3]

Lead is widely used in various industries due to its properties such as high density, softness, low melting point, resistance to corrosion, and opacity to gamma and X-irradiation, are useful.[4]

Exposure to Lead can have a wide range of biological effects depending on the level and duration of exposure, including effects on heme synthesis, the central nervous system, kidneys, alimentary tract, and other organs.[5–7]

Patients with lead neuropathy present with weakness that primarily involves the wrist and finger extensors, but which could also spread to involve other muscles.[8] Patients with unusually long exposure to inorganic lead may show mild sensory and autonomic neuropathic features rather than the motor neuropathy classically attributed to lead toxicity.[9] Lead intoxication in humans causes axonal degeneration, but in some other species it causes a primarily demyelinating neuropathy. Diagnosis of lead

neuropathy is important because it is potentially reversible and also because its early detection and treatment may prevent other systemic complications.[10]

CASE REPORT:

A 45 years male non-hypertensive, non-diabetic presented with 2 months history of slowly progressive weakness of his right hand which was followed after a period of 2 to 3 weeks by left hand weakness. No complaints of numbness, tingling or burning sensations. On examination he had pallor, wasting and weakness of the fingers and wrist extensors bilaterally with Medical Research Council (MRC) scale grade 3/5. There was no numbness, tingling or burning sensations. Rest of the systemic examination was unremarkable. The patient has been working in a battery manufacturing factory for the last 4.5 years. He is directly involved in assembling and processing of batteries. Blood complete picture with peripheral smear revealed Hb of 10.0 with MCV of 80fl, MCH of 27pg and basophilic stippling as shown in figure-1. Vitamin B-12 and folate levels were normal. We checked for serum lead levels which were raised with a value of 55.1 ug/dl (Normal value <5 ug/dl). A diagnosis of lead poisoning leading to bilateral wrist drop was made. For further confirmation nerve conduction studies were done to validate neuropathy.

Among motor nerves the both median and ulnar nerves showed normal distal latency and normal conduction velocity with normal voltage response. Bilateral radial nerves showed low voltage responses at extensor indicis. The radial nerves showed

normal responses when recorded at brachioradialis. The tibial and peroneal nerves are normal in distal latencies and velocities with normal voltage responses on right side and mild reduced on left side. Both radial sensory nerves are mild reduced in velocities and amplitudes. So the nerve conduction studies were suggestive of bilateral radial neuropathies as shown in table

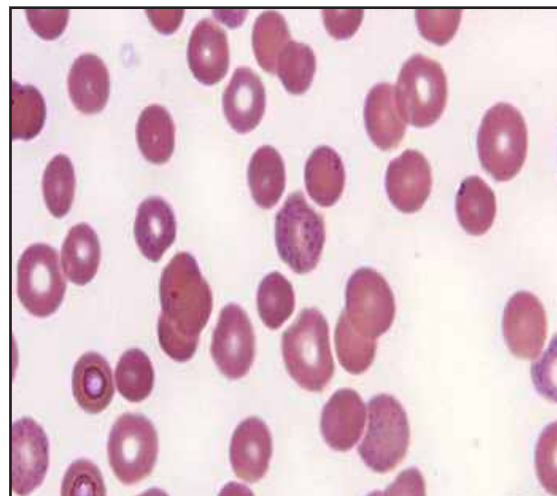


Figure-1:
Basophilic stippling of the patient of lead poisoning

MOTOR NERVES:

NERVE/SITE	ONSET (ms)	REF.RANGE	AMPLITUDE (mV)	REF.RANGE	VELOCITY (m/s)	REF.RANGE
Rt.Median Wrist Elbow	4.38 9.06	<4.2	4.83 4.86	>4.0	49.04	>50.0
Rt.Ulnar Wrist Below Elbow Above Elbow	2.66 6.41 8.91	<4.2	8.93 8.77	>3.0	61.33 60.00	>53.0
Rt.Radial (extensor indicis) 4cm Elbow	3.36 4.38	<2.8	0.31 2.13	>2	39	>50
Rt.Peroneal Ankle Fib.Head	5.31 12.42	<5.5	3.14 2.57	>2.5	42.90	>40.0
Rt.Tibial Ankle Knee	5.23 13.59	<6.0	5.52 4.17	>3	45.45	>41
Lt.Tibial Ankle Knee	5.86 14.22	<6.0	2.39 2.68	>3	42.26	>41
Lt.Median Wrist Elbow	4.61 8.98	<4.2	2.70 2.19	>4.0	52.51	50
Lt.Ulnar Wrist Below Elbow	2.11 6.33	<4.2	6.50 6.17	>3.0	56.8	>53.0
Lt.Radial (Extensor indicis) 4cm Elbow	6.41 10.16	<2.8	0.33 0.00	>2	41	>50

SENSORY NERVES:

NERVE/SITE	ONSET (ms)	REF.RANGE	AMPLITUDE (mV)	REF.RANGE	VELOCITY (m/s)	REF.RANGE
Rt.Median Wrist	3.91	<3.8	21.38	>20	48.36	>39
Rt.Ulnar Wrist	3.94	<3.7	19.30	>15	53.07	>50.0
Lt.Sural	3.63	<4.0	6.23	>6	41.81	>40.0
Rt.Radial	2.3	<2.8	4.12	>8	43.10	>40
Lt.Radial	2.7	<2.8	3.92	>8	39.10	>40

DISCUSSION:

Patients who present with bilateral wrist drop and not having any common cause detected then an extensive search for rare causes of bilateral wrist drop should be done. In our study the patient was a lead handler and was exposed to an occupational hazard and developed lead neuropathy.

Lead is used in many industries such as construction, ceramics, paints, plastics, and metallurgy and hence lead poisoning can be considered a common occupational hazard. The common sources of lead poisoning are fumes from burnt car batteries, ingestion of flaking paint, inhalation of vehicle fumes.[11] A classical description of lead poisoning has been provided by Van Gogh in his autobiographical letters. The symptoms include initial debilitation; stomatitis, with loss of teeth; recurring abdominal pains; anemia (with a 'plumbic' skin tone); neuropathy of the radial nerve; and a saturnine encephalopathy, with features such as epileptic crises, progressive changes in character and periods of delirium.[12] Rubens *et al.* (2001) reported 46 patients with neuropathic features who had been exposed to lead for periods ranging from 8 to 47 years (mean 21.7 years). All of them showed mild sensory and autonomic neuropathic features rather than just the motor neuropathy that is classically attributed to lead toxicity.[13].

Our patient was a factory worker having chronic and prolonged lead exposure and eventually developed bilateral radial neuropathy leading to wrist drop. Occupational lead exposure was a clue in this patient in developing lead neuropathy in an otherwise normal person.

We conclude that lead exposure and potential for lead to damage the peripheral nervous system is significantly high. Isolated neuropathy can be the presenting feature of lead toxicity predominantly radial neuropathy. Chronic lead exposure as a risk factor for neuropathy should be identified and treated promptly as its avoidance and treatment can save major disabilities. There is a need of introduction of extensive health and safety control measures on workplace exposure to prevent such occupational hazards.

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