

Tetraplegia as sequela from unintentional vegetarianism: Progressive axonal polyneuropathy due to meat aversion

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Case Diagnosis

37 y.o. F with PMH of GAD, migraines, obesity, hypothyroidism, with tetraplegia due to axonal neuropathy attributed to vitamin B deficiencies.

Case Description

Patient presented to primary care with one-month history bilateral paresthesias in the tips of the fingers and burning pain in the bilateral soles of the feet. Further history revealed new aversion to meat, resulting in emesis and periods of consuming only mangoes. Over two months, she unintentionally lost 30 lbs. Initial workup revealed macrocytic anemia and low B12. Lumbar and cervical x-rays were normal. She was started on B12 supplement and gabapentin. One month later, she presented to a community hospital with burning limb pain and perioral paresthesias and was found to have electrolyte abnormalities and lactic acidosis. Additionally, B1 and B6 levels were undetectable while B12 level had normalized. Once metabolic disarray resolved, she was transferred to an academic medical center for further workup and IVIG treatment due to concern for demyelinating process. Physical exam notable for antigravity strength throughout bilateral UE/LE and diminished proprioception in R LE. Nerve conduction studies three weeks apart demonstrated progressive axonal sensorimotor polyneuropathy in all four limbs. Sural nerve biopsy showed axonal neuropathy without inflammation or vasculitis. LP, EGD, bone marrow biopsy, and at pad biopsy were negative. She completed a 5-day course of IVIG and received B1, B6, and B12 supplementation.

NCS Results

Nerve	F Latency ms	Ref. ms
L Median – APB	29.0	≤31.0
L Tibial – AH	53.8	≤56.0

Table 1. Normal F Wave Latencies

NCS Results

Nerve	Peak Lat (ms)	NP Amp (uV)	Distance (cm)	Velocity (ms)
Left Median – Digit II (Antidromic)				
Wrist	5.21 (≤3.5)	5.0 (≥20)	13	32
Elbow	5.16	1.4		
Left Ulnar - Digit V (Antidromic)				
Wrist	5.36 (≤3.1)	7.4 (≥17)	11	27
NR in the Left Radial, Left Sural, Left and Right Superficial Peroneal nerves				

Table 2. Sensory nerve conduction studies

Nerve	Latency (ms)	Amp (mV)	Distance (cm)	Velocity (ms)
Left Median – APB				
Wrist	3.7 (≤4.4)	3.9 (≥4.0)	7	
Elbow	7.4	2.7	16.5	44 (≥49)
Left Ulnar - ADM				
Wrist	3.1 (≤3.3)	3.2 (≥6.0)	7	
B. Elbow	6.61	2.8	18	50.8 (≥49)
A. Elbow	8.8	2.6	12	54.9 (≥49)
Left Peroneal - EDB				
Ankle	5.4 (≤6.5)	1.2 (≥2.0)	9	
Fib Head	11.56	1.2	27.5	44.4 (≥44)
Pop Fossa	13.33	1.2	8	45.2 (≥44)
L Tibial -AH				
Ankle	4.3 (≤5.8)	8.8 (≥4.0)	9	
Pop fossa	12.9	6.0	34.5	40.1 (≥44)

Table 3. Motor nerve conduction studies

Discussion

Fortification of many foods has made vitamin deficiencies uncommon in the developed world. The most common causes include malabsorption, alcoholism, anorexia, and rapid weight loss. The B vitamins are most essential for nervous system integrity. B1 deficiency may present as dry beriberi with neuropathy, or wet beriberi with high-output heart failure with or without neuropathy. Severe B1 deficiency presents with Wernicke's encephalopathy and is rapidly corrected with IV thiamine to prevent Korsakoff syndrome. B6 deficiency is yet more rare due to its prevalence in an array of foods but may similarly cause a sensory neuropathy as well as GI symptoms and rash. B12 deficiency may cause macrocytic anemia, neuropathy, dementia, behavioral disturbance, myelopathy, and subacute combined degeneration.

Conclusions

B vitamin deficiency is an important cause of polyneuropathy and is potentially reversible when treated early. AIR is vital to optimizing function, particularly in cases when medical treatment results in only slight improvements in strength.

Our patient's strength did not improve with IV supplementation in acute care, but through acute inpatient rehab (AIR), strength improved by one grade in select muscle groups. ADL FIM scores doubled from 11 to 22, most notably grooming and upper body dressing improved from total assist to modified independent and setup, respectively. Mobility FIM score changes were modest, however she ultimately became independent with power mobility.

References

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