International Journal of Research in Medical Sciences
Paneyala S et al. Int J Res Med Sci. 2020 Dec;8(12):4518-4521
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012

DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20205336

Case Report

Neuropathy in the setting of alcoholism-an entity less thought of

Shasthara Paneyala*, Nemichandra S. C., Harsha Sundaramurthy, Vimala Christina Colaco K.

Department of Neurology, JSS Medical College and Hospital, Mysuru, Karnataka, India

Received: 05 October 2020
Revised: 09 November 2020
Accepted: 10 November 2020

***Correspondence:**
Dr. Shasthara Paneyala,
E-mail: shasthara.p@gmail.com

ABSTRACT

Disulfiram is a commonly used adjunctive treatment in the management of alcohol dependency. It has been noted that disulfiram can induce peripheral neuropathy, the mechanism of which has not been clearly determined. A 35-year-old patient, reformed alcoholic, on disulfiram presented with complaints of painful distal dysesthesias and foot drop. Clinical examination revealed bilateral foot drop without any objective sensory loss. Patient was evaluated for the same and routine blood investigations including vitamin B-12, inflammatory and virological markers were found to be normal. Nerve conductions studies revealed in excitable bilateral common peroneal and tibial nerves. Possibility of disulfiram induced peripheral neuropathy was thought of and drug was withdrawn. Patient was followed up and after two months improvement in motor power and reduction in paraesthesia's was noted. Disulfiram is a commonly used drug, the uncommon side effect of which is distal predominant axonal neuropathy. This must be kept be kept in mind when evaluating a patient presenting with features of peripheral neuropathy, on a background of alcohol abuse.

Keyword: Peripheral neuropathy, Disulfiram toxicity, Alcoholism

INTRODUCTION

Disulfiram introduced by Hald et al in 1948 has been used as a pharmacological agent in the management of alcohol dependence.[1]Although it is well tolerated in most patients, one in 15,000 patients will develop neuropathy every year.[2]

Disulfiram peripheral neuropathy is characterized by distal motor weakness sensory impairment with loss of coordination and painful paresthesias.[3] The severity of the neuropathy is directly related to dose and duration of exposure.[4] If disulfiram is not discontinued, sensory and motor impairment can progress proximally.[2]

Here we report the case of a patient who presented with distal motor weakness and painful paresthesia's, attributable to chronic unsupervised disulfiram consumption.

CASE REPORT

A 34-year-old man, reformed alcoholic, presented to the hospital with weakness of both lower limbs since the preceding one month. Weakness was predominantly in the form of inability to clear stairs and slippage of footwear. Patient also complained of burning dysesthesias, numbness and pain in the soles of the feet and the legs below the knees. There was no accompanying history of difficulty in getting up from squatting or sitting position or weakness in the upper limbs. Clinical examination revealed bilateral foot drop, bilateral reduction in foot strength (dorsiflexors medical research council (MRC) strength score: 2) with brisk reflexes in lower limbs. There was no objective sensory loss. The rest of the neurological and general physical examination were normal.

Routine laboratory tests, serum B12 assays, thyroid function tests, immunological and virological tests were normal (Table 1).

Table 1: Investigations.

Tests	Findings
Hemoglobin	14.7 gm/dl (MCV 86.9 fl, MCHV 24.4 pg, MCHC 32.7 gm/dl)
Total counts	9190 (neutrophils 54.4, lymphocytes 37.2)
Platelets	2.39 laks/cumm
RBS	71 mg/dl
Vitamin B12	1059 pg/ml
S. creatinine, S. urea	0.8 mg/dl, 22 mg/dl
HIV, HbsAg	Non-reactive

Nerve conduction studies showed in excitable common peroneal nerves, posterior tibial nerves on both sides with normal motor studies of upper limbs and normal sensory studies of all the four limbs (Figures 1-4).

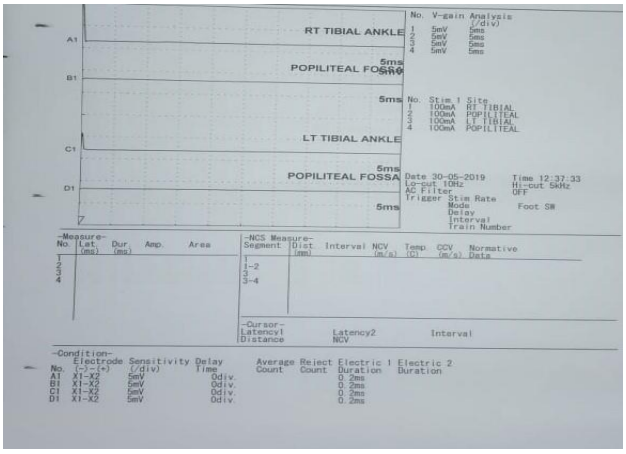

Figure 1: Nerve conduction study of lower limbs (tibial nerve).

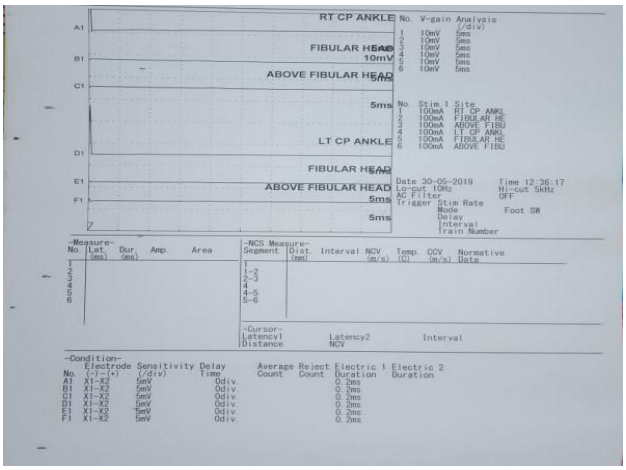

Figure 2: Nerve conduction study of lower limbs (common peroneal nerve).

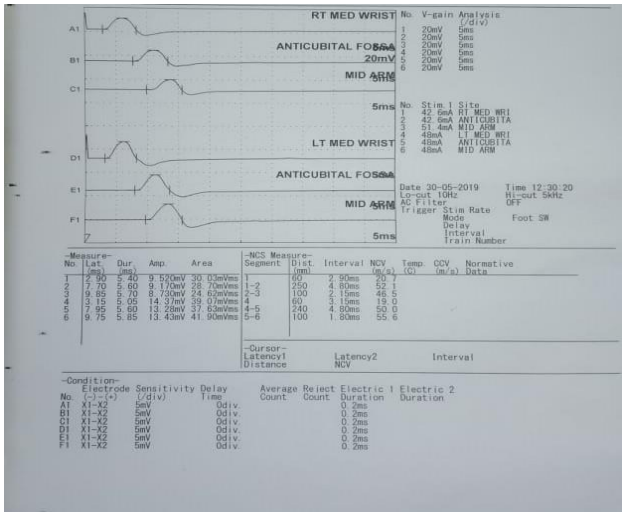

Figure 3: Nerve conduction study of upper limbs (median nerve).

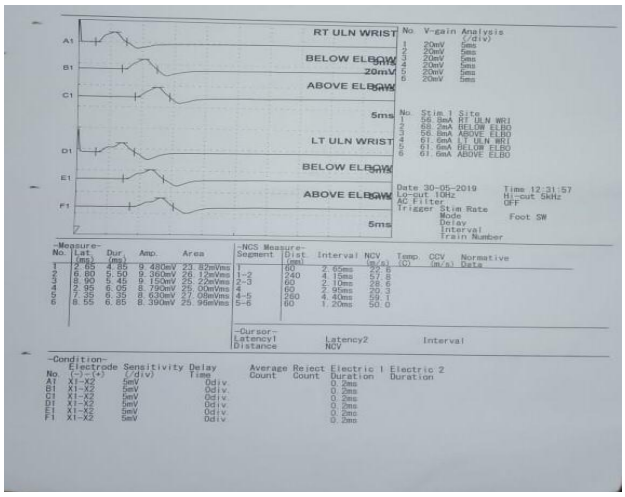

Figure 4: Nerve conduction study of lower limbs (ulnar nerve).

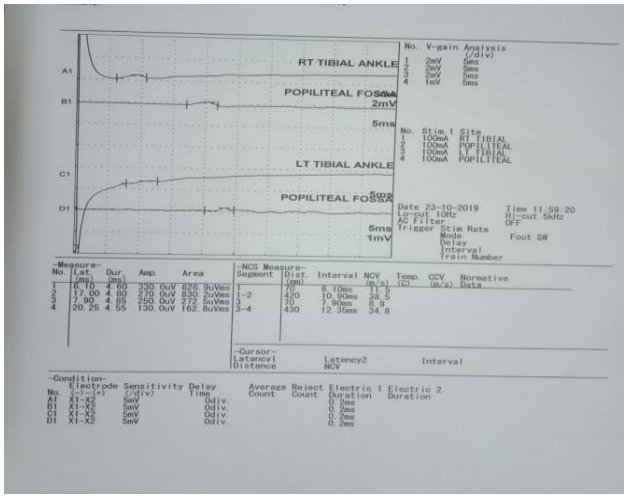

Figure 5: Nerve conduction study of lower limbs (tibial nerve) at follow up.

Following these investigations while conversing with the spouse she revealed that the subject had been abstinent for the past one year with his daily tablet of disulfiram of 500 mg/day which they were procuring as over the counter medication. Following this disulfiram treatment was discontinued and he was treated symptomatically with vitamins. One month after stopping disulfiram, neurological examination showed some improvement in painful paraesthesia, while strength and sensation deficits were unchanged. Two months later, improvement in strength (MRC 4) was observed. Repeat nerve conduction studies also showed electrophysiological improvement (Figures 5 and 6).

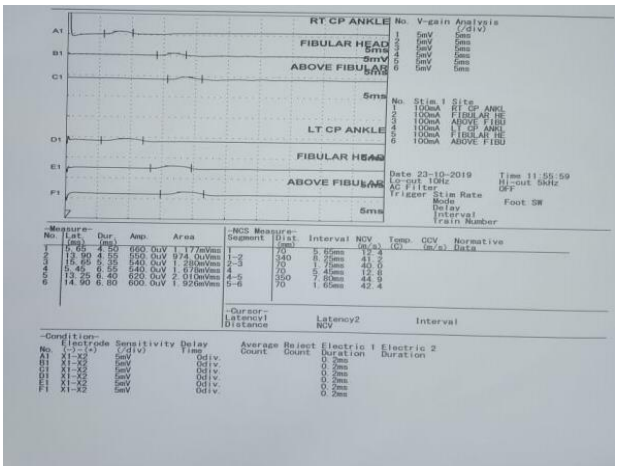

Figure 6: Nerve conduction study of lower limbs (commo peroneal nerve) at follow up.

DISCUSSION

Disulfiram (tetraethylthiuram disulphide) is a dithiocarbamoyl drug used in the treatment of alcoholism that irreversibly inhibits acetaldehyde oxidation by competing with nicotinamide adenine dinucleotide (NAD) for binding sites on liver aldehyde dehydrogenases. It is the elevated acetaldehyde levels that are responsible for the unpleasant effects associated with acetaldehyde syndrome.[3]

The mechanisms by which disulfiram results in peripheral neuropathy has not been conclusively proven. Disulfiram is converted enzymatically to carbon disulfide, which in animals' studies have been shown to cause neurofilaments axonopathy. Similar changes in human nerve after disulfiram administration suggest that carbon disulfide is the toxic agent.[3]

In addition to the mechanism of nerve toxicity being unclear, the precise nature of the pathologic lesion developing in subjects treated with disulfiram also remains controversial. Some authors have characterized the lesion as a primary demyelination, while others feel the lesion is one of axonal degeneration.[5,6]

Disulfiram neuropathy presents with various clinical presentations: polyneuritis with sensory, motor or both deficits quadriplegia and optic neuritis.[7-11] Disulfiram neuropathy can be mild or severe, depending on duration of exposure and the dosage and it occurs after a variable latent period (mean 5 to 12 months) and progresses steadily.[12] Most patients will present with a sensorimotor neuropathy of the lower limbs, which tends to improve as disulfiram administration ceases. However, some cases may remain with permanent sequelae.[13]

Disulfiram neuropathy is frequently misdiagnosed as alcoholic neuropathy as it is difficult to distinguish from that associated with ethanol abuse.

Literature review reveals, that even though disulfiram induced peripheral neuropathy can have variable presentations, distal predominant motor symptoms and axonopathy is the most frequently encountered initial clinical and electrophysiological finding respectively.

In our patient the clinical phenomenology was consistent with previous case reports. After excluding the common causes of motor sensory neuropathy and discontinuation of the offending agent our patient has shown clinical improvement. Hence, we attribute the motor axonopathy in this case to disulfiram.

This case highlights the fact that in alcoholic patients with neuropathy, the clinician has to make an effort to elicit history of disulfiram use.

CONCLUSION

The clinical effects of disulfiram on the central nervous system are well known but knowledge regarding the probable association between this drug and peripheral neuropathy is lacking among most medical professionals. If it is invariably assumed that peripheral neuropathy is due to the effects of alcohol consumption leading to continued usage of the drug and further worsening in neuropathy. Awareness of this entity among treating physicians and psychiatrists is of paramount importance in order to avoid persistent neurological damage associated with prolonged disulfiram usage.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. Hald I, Jacobsen E. A drug sensitizing the organism to ethyl-alcohol. Lancet. 1948;2:1001.
2. Bevilacqua JA, Díaz M, Díaz V, Silva C, Fruns M. Disulfiram neuropathy. Report of 3 cases. Rev Med Chil. 2002;130(9):1037-42.
3. Karamanakos PN, Pappas P, Stephanou P, Marselos M. Differentiation of disulfiram effects on central

catecholamines and hepatic ethanol metabolism. Pharmacol Toxicol. 2001;88:106-10.
4. Ansbacher LE, Bosch EP, Cancilla PA. Disulfiram neuropathy: a neuro-filamentous distal axonopathy. Neurol. 1982;32(4):424-8.
5. Bouldin TW, Hall CD, Krigman MR. Pathology of disulfiram neuropathy. Neuropath Appl Neurobiol. 1980;6:155-60.
6. Gardner-Thorpe C, Benjamin S. Peripheral neuropathy after disulfiram administration. J Neurol Neurosurg Psychiat. 1971;34:253-9.
7. Frisoni GF, Di Monda V. Disulfiram neuropathy: a review (1971-1988) and report of a case. Alcohol. 1989;24:429-37.
8. Bradley WG, Hewer RL. Peripheral neuropathy due to disulfiram. Br Med J. 1966;2:449-50.
9. Dupuy O, Flocard F, Vial C, Rode G, Charles N, Boisson D et al. Disulfiram (Esperal) toxicity, Apropos of 3 original cases. Rev Med Interne. 1995;16(1):67-72.
10. Kulkarni RR, Pradeep AV, Bairy BK. Disulfiram-induced combined irreversible anterior ischemic optic neuropathy and reversible peripheral neuropathy: a prospective case report and review of the literature. J Neuropsychiatry Clin Neurosci. 2013;25:339-42.
11. Orakzai A, Guerin M, Beatty S. Disulfiram-induced transient optic and peripheral neuropathy: a case report. Ir J Med Sci. 2007;176:319-21.
12. Watson CP, Ashby P, Bilbao JM. Disulfiram neuropathy. Can Med Assoc J. 1980;123(2):123-6.
13. Van Rossum J, Roos RA, Bots GT. Disulfiram polyneuropathy. Clin Neurol Neurosurg. 194;86(2):81-7.

Cite this article as: Paneyala S, Nemichandra SC, Sundaramurthy H, Colaco KVC. Neuropathy in the setting of alcoholism-an entity less thought of. Int J Res Med Sci 2020;8:4518-21.