

Expanding Mad Hatter's Shakes: Peripheral Nerve Hyperexcitability Syndrome with Artefactual-Looking Lung Lesions

Sir,

Peripheral nerve hyperexcitability syndromes (PNHS) are a group of disorders characterized by spontaneous and continuous muscle activity resulting from the generation of abnormal impulses from the peripheral nerves. They manifest as muscle stiffness, cramps, fasciculations or myokymia, with or without limb weakness^[1] and electromyography (EMG) demonstrates spontaneous discharges in the form of doublets, triplets or multiplets of high frequency (between 150-250Hz).^[2] Although, usually idiopathic, they can be associated with neoplasms like thymoma^[3] or rarely with heavy metal poisoning (lead, gold, silver and mercury).^[4] We present a case of mercury poisoning presenting with neuromyotonia seeking to highlight that peripheral stigmata of systemic illnesses should be actively sought for before making a diagnosis of idiopathic autoimmune PNHS.

A 19-years-old boy presented with subacute onset, progressively increasing intermittent painful cramps in both calves and thighs, associated with involuntary twitching movements with stiffness since the past 4 months. These complaints became continuous in the next 2 weeks and worsened with activity but were not improved with rest or analgesics. These were associated with a reddish, painless, non-pruritic, maculopapular rash which started on the trunk and spread to the arms and face over the next 1-2 weeks. Thereafter, the rash turned black and disappeared in the ensuing month, but with residual pigmentation.

History of alternative medication intake was present for 2 weeks prior to symptom onset for vague complaints of

constipation and dyspepsia. There was no history of weakness, sensory loss and cognitive/behavioural symptoms and family history was insignificant.

On examination, hyper-pigmented papules were present all over the body [Figure 1a] and myokymia was noticed over calves and lateral aspect of thigh. Remaining neurological examination was normal.

A diagnosis of a PNHS was made. Routine investigations, thyroid function tests, viral markers for HIV, hepatitis B and C, magnetic resonance imaging (MRI) brain and cerebrospinal fluid (CSF) examination were normal. Chest X-ray (CXR) revealed a military mottling across the chest area exposed to radiation, not limited to the lung fields [Figure 1b]. Electrophysiological study (EPS) revealed normal nerve conductions but EMG revealed the presence of neuromyotonic discharges in both lower limbs when tested in vastus lateralis and tibialis anterior, confirming our diagnosis. Serum auto-immune profile was tested which came strongly positive for contactin-associated protein 2 (CASPR2) with a negative result for others (NMDA, AMPA, LGI1, GABA-B). Computed tomography (CT) thorax was negative for thymoma. Urine and serum were tested for heavy metals in view of alternative medication intake, both of which showed very high levels of mercury (130.89 mcg/L and 245 mcg/L respectively; normal value <10 mcg/L). Skin biopsy done from the hyper-pigmented papules was suggestive of lichen planus pigmentosus. This dermatological manifestation is known to occur as an allergic reaction to mercury.^[5]

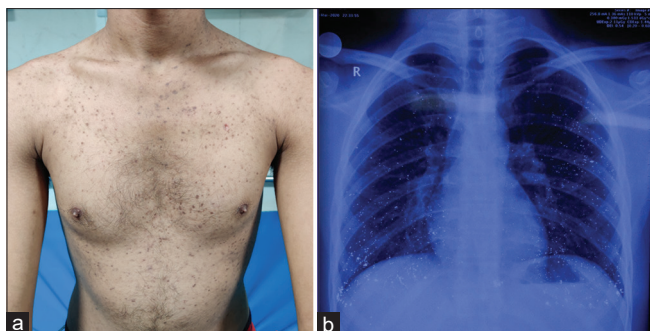


Figure 1: (a)- Hyperpigmented papules present over the trunk. (b)- Chest X-ray revealing military mottling across the chest area exposed to radiation, not limited to the lung fields

He was treated with intravenous infusion of 1 gram of methylprednisolone for 5 days along with carbamazepine, with cessation of alternative medications. He started improving 1-2 weeks into his treatment and had near resolution of symptoms at 2 months of follow up. Chelation therapy could not be given due to unavailability and cost prohibitions.

Acquired neuromyotonia, a form of PNHS, is an auto-immune disorder with antibodies against CASPR2 component of voltage gated potassium channel complex (VGKCC) being present in 30-40% cases.^[3] Although mostly idiopathic, auto-immunity can rarely be triggered by heavy metal poisoning like mercury^[1] leading to a presentation with neuromyotonia. We hypothesize that exposure to toxic doses of mercury induced auto-immunity in our patient (leading to CASPR2 positivity) and manifestation with neuromyotonia. Similar cases have documented in literature.^[6,7] None of these cases however, had the skin or CXR lesions seen in our patient. These helped us in identifying the cause for neuromyotonia in our patient.

Heavy metal poisoning might be an under recognised cause of auto-immune disorders in the community since it is infrequently suspected and therefore never sought, often compounded by patients hiding history of alternative medication intake. Early recognition and treatment lead to good symptomatic recovery, and prevents systemic dysfunction which might otherwise result from toxicity.

LEARNING POINTS

1. Mottling pattern seen on CXR extending outside the lung fields should raise suspicion for heavy metal toxicity, especially mercury.
2. General physical examination finding of lichen planus pigmentosus is a clinical clue to the etiology of mercury poisoning

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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