Cutaneous mercury granulomas, hyperpigmentation and systemic involvement: A case of mercury toxicity following herbal medication for psoriasis

Sir,

The use of alternative medicine is increasing across the globe due to the ease of access and favorable public perception about their safety and curative properties. However, there have been multiple reports of heavy metal toxicity following the usage of indigenous medicinal preparations. Although heavy metals used in traditional medicine are supposed to undergo extensive processing, rendering them safe, regulations regarding their manufacturing are found to be inadequate or ineffective. Analyses of preparations available in the market reveal presence of heavy metals in excess of the recommended daily exposure levels.[1] Here, we present a case of mercury toxicity with generalized hyperpigmentation and cutaneous mercury granulomas following the use of herbal medicines.

A 65-year-old female, a known case of psoriasis (biopsy proven), under irregular follow-up for past three years - had been treated initially with oral methotrexate for six months, which she had then stopped and currently on topical medication, presented to the dermatology outpatient department with a non-healing ulcer on the lateral aspect of the right leg, just above the lateral malleolus for one month and generalized erythema and scaling for three days. She noticed a fluid-filled lesion on the right leg about one month back which ruptured forming an erosion that then progressed to form a painful ulcer. With a provisional diagnosis of exfoliative dermatitis secondary to psoriasis; she was treated with parenteral methotrexate and supportive treatment along with conservative management of the ulcer. However, she returned after a month with generalized scaling and morphologically different skin lesions – hyperpigmentation with charred appearance of skin [Figure 1] and the leg ulcer was persisting.

Repeat biopsy taken from the charred truncal lesions showed acanthosis, spongiosis and parakeratotic hyperkeratosis with lichenoid infiltrates and basal cell degeneration. Dermis showed edema with pigment incontinence and lymphocytic infiltrate mixed with eosinophils, plasma cells and histiocytes.

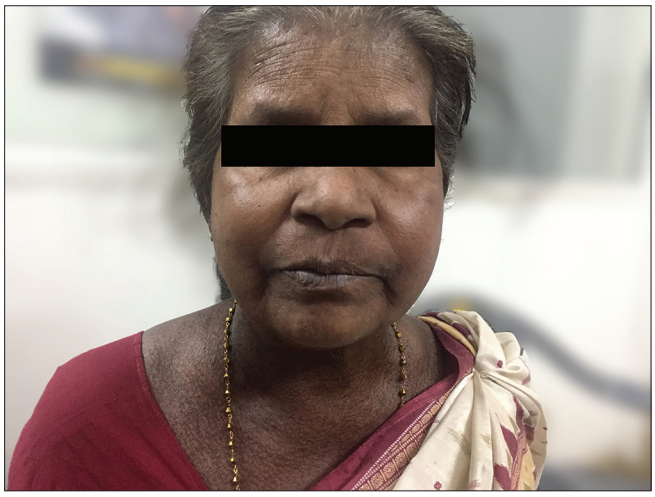

Figure 1a: Charred pigmentation on the face

Figure 1b: Charred pigmentation on the neck

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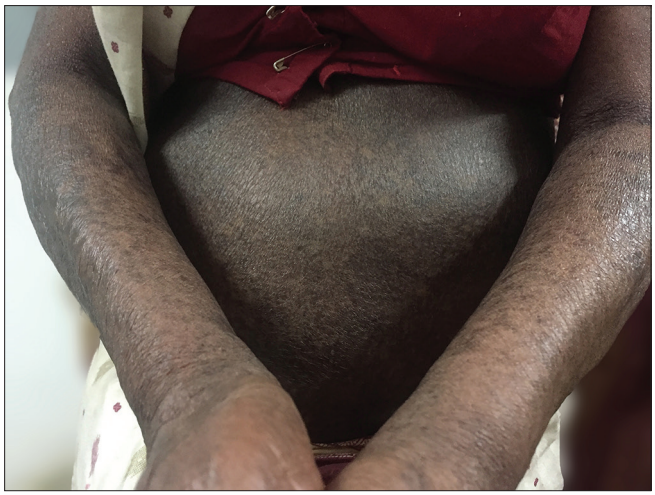

Figure 1c: Charred pigmentation on the abdomen

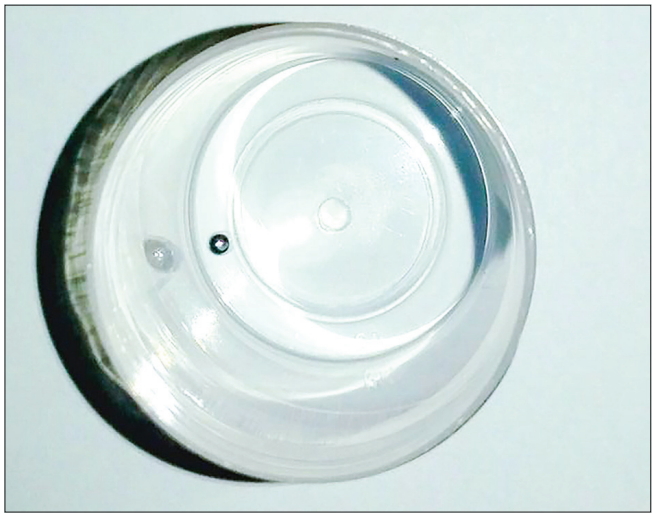

Figure 2: Silvery sphere of mercury extruded from ulcer

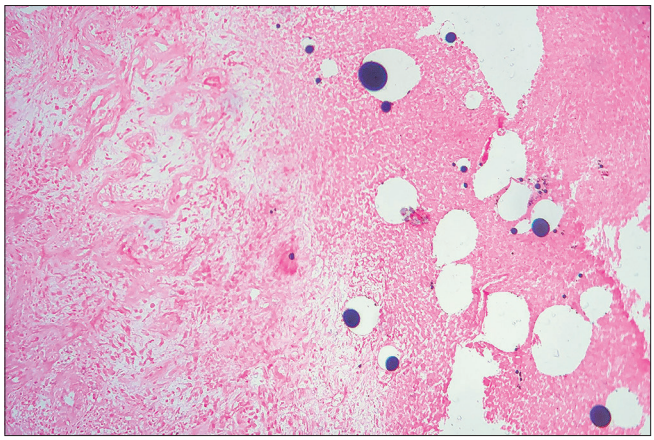

Figure 3: Mercury globules surrounded by necrosis (Hematoxylin and eosin, ×100)

With these findings, the possibility of a superimposed drug reaction was considered. There was no history of any new drug intake; however, she gave a history of intake and application

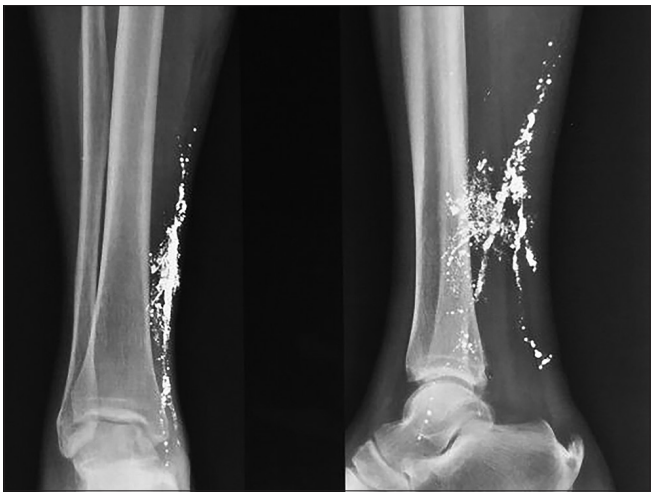

Figure 4: X-ray of the right leg showing metallic deposits

of herbal medications (powders to ingest and oily medications to apply) intermittently for several months. Debridement of the ulcer exuded a silvery fluid, condensing quickly to form spheres which tested to be mercury [Figure 2]. Biopsy from the ulcer showed extracellular round black deposits of mercury in the epidermis surrounded by necrosis [Figure 3]. X-ray of the right leg showed metallic densities in the anterior and lateral aspect of the right leg in the middle and lower 1/3rd of the soft-tissue plane [Figure 4]. Blood levels of mercury were found to be elevated – 101.99 mcg/L (inductively coupled plasma mass spectrometry; reference range: 0.46–7.5 mcg/L). Repeat estimation continued to show increased levels (118 mcg/L).

With these findings, the patient was suspected to have mercury toxicity with the ulcer being a cutaneous mercury granuloma. Neurological examination showed muscle weakness and tremors. Blood workup showed no significant abnormalities (Hemoglobin – 11.5 g/dl, random blood sugar – 180.5 mg/dl, sodium – 139 mmol/L and potassium – 4.8 mmol/L). Nerve conduction studies showed decreased amplitude in bilateral lower limbs. Chelation therapy with oral d-penicillamine (500 mg six hourly) was initiated for a period of seven days. Her symptoms including the charred appearance and pigmentation [Figure 5] improved. Her ulcer started to heal and she was discharged in a stable condition.

The presentation of mercury toxicity varies with form, route and duration of exposure. Systemic adverse events include gastroenteritis and nephrotoxicity (mercury salts); neurological and teratogenic effects (organic mercury) and interstitial pneumonitis and neuropsychiatric symptoms (elemental mercury vapors). In children, chronic exposure to any form of mercury can cause acrodynia.

Cutaneous hyperpigmentation can occur due to application of mercury containing topical agents or occupational exposure. We hypothesize that the charred hyperpigmentation seen in our patient was most likely due to mercury (perhaps, a lichenoid

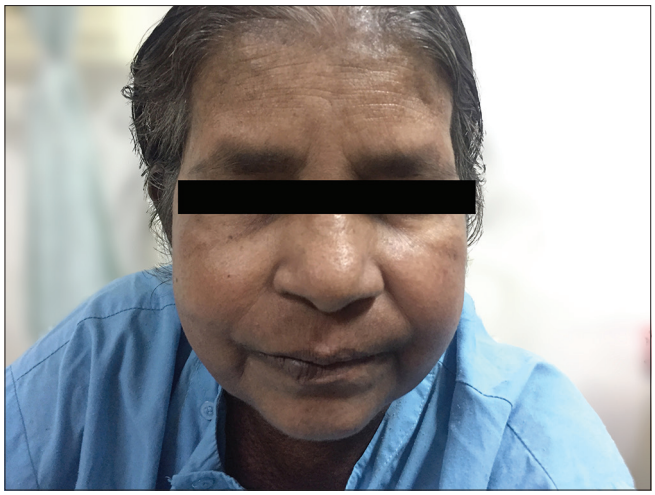

Figure 5: Resolution of pigmentation post-chelation therapy

reaction, given the histopathological findings), considering the rapid improvement post-chelation therapy. Other dermatological adverse effects reported include acute contact dermatitis, lichenoid tattoo reaction, oral lichenoid reactions from mercury in dental amalgam and mercury exanthema.[2]

Introduction of elemental mercury into skin and soft tissue causes a localized granulomatous reaction called cutaneous mercury granuloma. Most reported cases are following traumatic inoculation with a few caused by self-injection.[3] Repeated application of preparations containing mercury on wounds has been known to induce granulomas, as may have occurred in our case.[2] Systemic toxicity associated with cutaneous mercury granuloma has been reported only in a few cases.[4] Histopathological examination shows black spherical mercury globules surrounded by collagen necrosis in early cases, like ours; whereas, late lesions show mercury deposits surrounded by granulomatous foreign body reaction and mixed inflammatory infiltrate.[5]

The growing popularity of traditional Indian remedies necessitates a critical evaluation of associated risks. Clinicians should be aware of varied presentations of heavy metal toxicity when patients provide history of alternative medicine usage. Providing proper general awareness to consumers and producers, quality control and pharmacovigilance are needed to minimize these adverse events.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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