Lead Toxicity due to Quack Remedies

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Introduction

Lead toxicity due to exposure to environmental pollution and industrial emissions has been extensively studied and many measures to prevent the same are being implemented. But many cases resulting from exposure to herbal or local unnamed preparations administered by quacks to unsuspecting patients go unnoticed, unreported or undiagnosed. Lack of facilities to analyze blood/urine samples of a suspected case is another factor contributing to under diagnosis of even cases with high index of clinical suspicion. We report a case of lead toxicity due to medicinal administration of an unnamed preparation, which was suspected clinically and subsequently confirmed by analyzing venous blood samples by Atomic Absorption Spectrophotometry.

Case Report

A 33 years old serving soldier was admitted with complaints of weight loss, loss of appetite, non-anginal chest pain, breathlessness, generalized weakness, headache, nausea and vomiting. He was having breathlessness, chest discomfort, feeling of chest compression while sleeping for the last two months. Two days before admission he started having abdominal colic, nausea and vomiting. There was history of un-quantified weight loss also. He had mild hypertension, severe pallor and non-tender hepato-splenomegaly. Cardiac, respiratory and liver functions were within normal limits. Neurological assessment revealed no abnormality. He was treated symptomatically and his condition improved as the symptoms got relieved within a few days.

Laboratory investigations at admission revealed Hb level of 8.7 gm%, microcytic hypochromic anaemia with no evidence of haemolysis. Although iron stores were marginally depleted, there was no evidence of chronic blood loss in stools or urine. Bone marrow studies showed erythroid hyperplasia. His hemoglobin level decreased considerably by the end of the first month of his hospital stay (6.5 gm%), despite being managed with iron supplements and other haematinics. Metabolic and renal function parameters were within normal limits.

Taking serious note of the poor response to treatment, the case was reviewed. On further questioning the patient came out with the history of having been treated for primary infertility by a quack in his native place with an unnamed preparation. The patient had taken the said preparation for about two to three months when he developed the above mentioned symptoms. Earlier investigations had revealed the cause of infertility as poor sperm count and hence he did not get his wife treated by the quack. No other family member had ever experienced any symptom suggestive of lead toxicity.

In the light of this new information and considering the symptomatology, chronic lead poisoning due to intake of the quack preparation was strongly suspected and blood lead levels (BLL) were estimated in a reputed private laboratory. The BLL was reported as 27 micrograms/dl. The analysis was carried out by the time tested Atomic Absorption Spectrophotometry.

However, simultaneously the BLL was estimated by the Dept of Forensic Medicine and Toxicology, AFMC, Pune, by the same method at Public Health Lab, Pune. Due precaution to run control samples of known lead content was taken and BLL was found to be 90 micrograms/dl. Treatment with chelating agent, penicillamine, was started with 250 mg tab two times a day as he was symptomatic and the BLL was high. Periodic estimation of his BLL was carried out to assess the response to therapy.

He was discharged with the advice to continue the drug till further advice. Periodic review as an out-patient was carried out. His general condition improved, he continued to remain asymptomatic and his BLL came down to 25 micrograms/dl after six months of treatment.

Results of subsequent analyses during the course of treatment with penicillamine are tabulated in Table 1.

Discussion

Lead toxicity due to ayurvedic, herbal or unnamed preparations by phakirs, vaydhs or quacks is quite prevalent in India but very few cases are detected. Preparations containing heavy metals are administered by quacks for chronic ailments like joint pains, asthenia,

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Table 1**Blood lead levels**

Date	BLL	Duration
12.10.2006	90 micrograms/ 100ml blood	Baseline sample before starting chelation therapy.
26.12.2006	60 micrograms/ 100ml blood	After 10 weeks of therapy
15.2.2007	55 micrograms/ 100ml blood	After 16 weeks of therapy
15.4.2007	25 micrograms/ 100ml blood	After six months of therapy

infertility, impotence, immunological disorders etc [1]. The magnitude of the problem is not known since there is no data available on this subject. Many a times the condition is subclinical and when the condition presents clinically, its features simulate clinical features of many diseases [2]. High index of suspicion and clinical alertness to such a possibility are the key factors in detecting such cases.

As per published literature, BLL of less than 40 micrograms/dl does not produce any clinical evidence of chronic lead toxicity [3]. Clinical features of toxicity are usually seen when a person is exposed to lead in small quantities for a prolonged period, as lead is a cumulative poison [2]. Chronic exposure in industrial setting leads to the metal entering the body through oral and inhalation routes, especially through the latter route due to its low melting point and as fine dust, being a soft metal [2]. BLL more than 70 micrograms/dl produces lead encephalopathy in children, and is a medical emergency. In adults at BLL of 70-100 micrograms/dl, moderate toxicity will be seen with clinical features of tiredness, headache, moodiness, lessened interest in leisure activity, impaired psychometrics, impaired reproduction, hypertension, memory loss, decreased libido, insomnia, metallic taste, abdominal pain, anorexia, constipation, mild anaemia, myalgia, muscle weakness and arthralgia [2,4]. In the present case patient had many of these features suggesting moderate toxicity.

Treatment with chelating agents such as penicillamine is advocated when the blood lead level is more than 60 micrograms/dl, if symptomatic or 80 micrograms/dl even if asymptomatic [4]. However the mainstay of the treatment is to prevent further exposure to the poison by changing the work environment, which alone will be sufficient at levels lower than 45 micrograms/dl. Diet with high nutritional value with calcium, iron and thiamine supplements is an essential part of the treatment as it not only improves the general condition of the patient but also enhances excretion of lead. Hence the recommendation of additional intake of milk for lead handlers like painters, acid-battery workers etc. [5]. The duration of therapy with chelating agents depends upon

BLL and response to treatment. The adverse effects during chelation therapy may be due to heavy metal being pulled out of tissues which are circulating in the blood. Treatment for even up to six months has been tried with beneficial effects [6].

Lack of facilities to analyse the BLL / urine lead level is another hindrance in arriving at a definitive diagnosis. Toxic effects of chelating agents-e.g. renal damage discourage the treating doctor from initiating therapy on suspicion or provisional diagnosis [2].

However, a state-of-the-art Diagnostic Toxicology Lab has been established in the Department of Forensic Medicine and Toxicology, AFMC, Pune and it will function as a referral lab for all the AFMS hospitals.

To conclude a high degree of clinical suspicion and meticulous clinical examination, including detailed history taking, is the key to success in diagnosing chronic heavy metal poisonings. Clinicians should ensure that a check on the reliability of the report of a private commercial laboratory is effected by sending another sample of known value along with the test sample.

Needless to say that education of troops by RMOs about the dangers of using unnamed products or treatment by quacks goes a long way in preventing exposure to such toxic substances.

Conflicts of Interest

None identified

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