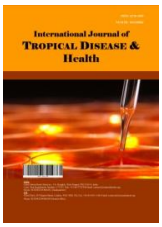

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# A Case of Acute Lead Toxicity Associated with Siddha Medication

**Sandheep Janardhanan[1*], Allwin James[1], Alagammai Palaniappan[1] and Ramesh Ardhanari[1]**

*[1]Department of Gastroenterology Meenakshi Mission Hospital and Research Center, Melur Road Madurai, Tamil Nadu, 625107 India.*

***Authors' contributions***

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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***Case Study***

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## ABSTRACT

Siddha is an indigenous system of medicine practiced exclusively in South India.Some of these formulations have been postulated to cause heavy metal poisoning,like lead toxicity. Here we present a case of Siddha medicine induced lead toxicity causing intractable chronic abdominal pain

*Keywords: Abdominal pain; Blood Lead Levels (BLL); Dimercapol.*

## 1. INTRODUCTION

Siddha, like Ayurvedais anative system of medicine, which has been practiced in the South India since time immemorial.It emphasizes the use of plant and herb based medicine with emphasis on holistic healing of the body and mind. Unfortunately, heavy metals and minerals like lead, mercury, arsenic, gold etc are often added to the formulation with a belief that, they

**Corresponding author: Email: sandheepjanardhanan47@gmail.com;*

are essential components of vital molecules in the various metabolic pathways.As early as 2004, Centre for Disease Control (CDC) reported more than fifteen cases of lead poisoning in United States associated with Ayurveda and other alternative medicines [1]. There are few such case reports from India also [2,3] Unfortunately, most are unreported or undiagnosed.

## 2. CASE

A forty five year old gentleman from Tamil Nadu, a beautician by profession, presented to our department with history of abdominal pain of one month duration. He was recently detected to have diabetes, and was put on powdered Siddha medication, which he took twice a day for ten days. Soon after that, he developed sudden onset of abdominal pain, diffuse, intermittent, which was exacerbated by food intake, especially after dinner. There was significant loss of appetite and weight. He also had progressive constipation .There was no history of, fever, oliguria, edema, bleeding manifestation, itching or altered sensorium. He was a teetotaler and nonsmoker and there was not any significant past positive medical, surgical, family and travel history. Hewas admitted in gastroenterology department of a tertiary care hospital outside and was completely worked up Baseline investigations like hemogram, urine and stool analysis, serum liver, kidney, pancreatic, thyroid function tests, electrolytes were found to grossly with in normal limits. Viral markers were also negative and complete abdominal imaging (Ultrasound and CECT abdomen) and upper GI study failed to yield any clues. Cardiac workup was normal and there was no evidence of hypergylcemia/ketoacidosis. The pain was not suggestive of diabetic neuropathy/abdominalwall pain/functional pain (Carnett sign negative). He was referred here for further management .Pertinenteexamination revealed a conscious, cooperative gentleman, had pallor and with mild tenderness on abdominal examination.All the tests done in other hospital were repeated by us and were inconclusive including baseline tests, imaging (ultrasound, CECT abdomen with chest screening , Pan endoscopy (upper and lower gastrointestinal scopy ) were grossly within normal limits. Anemia workup showed evidence of microcytic hypochromic anemia on peripheral smear, but without any abnormal pattern after observation by two expert hematopatholgists. Serum ironstudies like serum ferritin,transferrin saturation was within normal limits.Since serum calcium and Parathyroid hormone wereslightly high (10.2 meq/L) and (75 mcg/l respectively ), we went ahead with parathyroid sestamibi scintigraphy and neck imaging screening which also, was normal.. However with a strong suspicion of lead posioning, blood lead level (BLL) measurement was done which revealedextremely high levels( 700 µ g/dl )(Normal valuesl<20 µ g/d)Four frontline drugs i.e (Na2Ca2EDTA, Dimercaprol(BAL), DMSA(Succimer) and penicillamine have been found to be usefu in lead toxicityl.Due to non-availability of EDTA and succimer, we started chelation therapy with Dimercapol(4mg/kg) IM injection every fourth hourly while monitoring baseline serum measurements and checking for any adverse drug reactions. The intensity of pain subsided significantly and he became asymptomatic Repeat BLL was still high but substantially lesser than pretreatment values (400 µ g/dl).We commenced pencillamine therapy 1g/day in divided doses for four weeks as it was the only drug available for maintenance treatment [4]. He was reviewed one month later, his BLL was normal (16 µ g/dl) and hewas asymptomatic.

## 3. DISCUSSION

Exposure to lead through ingestion or inhalation can occur from contaminated air, water, soil, food, and consumer products. Occupational exposure is currently the most common cause of lead poisoning in adults. Nonetheless, toxic exposure to lead through alternative sources remains a significant and poorly recognized public health problem. Currently, there are over six thousand different Ayurveda preparations that are manufactured for children and adults as herbal remedies to treat a wide range of illnesses including the common cold, diabetes, infertility, cardiovascular problems, psychiatric disorders etc. A comprehensive analysis of 193 Ayurveda medications revealed the presence of heavy metals in around 20% of the products analyzed [5]. Hoever, there is no data on heavy metal toxicity associated with Siddha medication, as the geographic outreach of Siddha is lesser than Ayurveda. The symptoms of adult lead poisoning include abdominal pain, nausea, constipation, anorexia, fatigue, decreased libido, headache, irritability, arthralgia, myalgia, anxiety and neurologic dysfunction ranging from subtle cognitive deficits to a predominantly motor peripheral neuropathy to encephalopathy. . The symptoms of lead toxicity usually appear at BLLs of 40-60 µg/dL in adults. The vast majority of

individuals presented with gastrointestinal symptoms including abdominal pain, nausea, vomiting, anorexia and constipation and of them were found to have elevated BLLs [3]. The current reference range for acceptable BLLs in healthy individuals without excessive exposure to environmental sources of lead is < 10 µg/dL for children and < 25 µg/dL for adults [6]. To date, there are no clinical trials that define the optimal management although it is generally accepted that the first step is to identify and remove the source of the exposure. Chelation therapy should be initiated when the BLL is > 80 µg/dL in asymptomatic and > 50 µg/dL in symptomatic adults and should be continued until the BLL is < 30 µg/dL. Managements varied widely and included oral chelation with D-penicillamine or DMSA or intravenous infusions of Ca-EDTA, Na-EDTA, or dimercaprol [7-8] In some instances, combination therapy was administered. Jain et al described a similar case where dimercapol was used because of non-availability of other drugs [6]. One striking feature was that our patient did not have basophilic stippling. Even though considered a pathognomonic feature of lead toxicity, it has been replaced by serum blood levels after 1980s. Cheson et al had noted that in a review of peripheral blood smears from 1,000 consecutive patients with lead toxicity, basophilic stippling was observed only in 27%. Also it has been noted in other heavy metal poisoning and sometimes even in normal subjects [9].

## 4. CONCLUSION

Siddha, much like Ayurveda is an indigenoussystem of medicine practiced by a significant minority in South India. Most of the patients who take Siddha medications are thus vulnerable to heavy metal toxicity, which is a major health hazard [10,11] Sadly, there is less awareness of the magnitude of this problem and absence of strict monitoring guidelines as symptoms are mostly subtle and unless analyzed and correlated with an eagle's eye, are missed easily [12,13]. It it is imperative that mandatory enforcement of rules and regulations are issued with sales and consumption of such drugs.

## DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

## CONSENT

It is not applicable.

## ETHICAL APPROVAL

It is not applicable.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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