



CASE REPORT

Traditional medicine: a rare cause of lead poisoning in Western countries [v1; ref status: indexed, <http://f1000r.es/2c6>]

Halima Muller, Simon Regard, Nicole Petriccioli, Omar Kherad

Service de Médecine Interne, Hôpital de la Tour, Geneva, Switzerland

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Abstract

A 42-year-old man from Bhutan was admitted to the emergency department with a 5-day history of abdominal pain, nausea and vomiting. Enhanced abdominal CT scan was found negative, however laboratory tests showed hemolytic anemia and basophilic stippling which are often seen in lead and heavy metal poisoning. Additional tests revealed a high level of lead in blood and urine. The patient was administered a chelator treatment with rapid improvement of the symptoms. A detailed interview revealed that the patient had been taking daily Bhutanese traditional medicines to treat a Bell's palsy from which he had been suffering for a few months. The analysis of these medicines confirmed the presence of a high level of lead.

Article Status Summary

Referee Responses

Referees	1	2
v1 published 19 Nov 2013	 report	 report

- Arnaud Perrier**, University Hospitals of Geneva (HUG) Switzerland
- Bruno Mégarbane**, Lariboisière Hospital, Paris-Diderot University France, **Robert Garnier**, Fernand Widal Hospital

Latest Comments

No Comments Yet

Corresponding author: Omar Kherad (omar.kherad@latour.ch)

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Introduction

Lead poisoning is a multisystemic organ disease which can present with non-specific symptoms such as fatigue, anorexia, arthralgia, myalgia, neurological disorders, anemia abdominal pain and encephalopathy.

Basophilic stippling, which refers to the presence of blue granules of various sizes dispersed throughout the cytoplasm of the red blood cell may be seen in blood smears. Burton line, and nephropathy (Fanconi-type syndrome), are also described¹. The diagnosis of lead poisoning is based on clinician consideration to assess blood lead level and erythrocytic protoporphyrins. The treatment consists of the elimination of the source of exposure and a chelation therapy with DMSA (dimercaptosuccinic acid) or CaEDTA^{2,3}. Timely diagnosis and identification of the source of exposure are critical in preventing the long-term consequences of lead poisoning.

Lead exposure and poisoning is still a major health issue in developing countries⁴. It was estimated to be responsible for 8,955,000 disability-adjusted life years (DALYs) in 2004, i.e. 0.6% of all DALYs⁵. Lead poisoning is most commonly caused by occupational exposure (especially in adults)⁶. Other sources of lead poisoning include exposure to paint (especially in children), water and soil (especially in urban areas), food (including game) and toys (especially in children where toys may have lead-based paints), as well as complementary and alternative medicines (CAM). As a consequence of globalization, lead poisoning cases caused by CAM are increasingly reported in developed countries⁷.

Case presentation

A 42-year-old man from Bhutan with a history of hypertension was admitted on 26th October 2011 to the emergency department of a secondary hospital in Geneva, Switzerland, complaining of epigastric pain with nausea and vomiting over the previous 5 days. A gastroscopy showed esophagitis and the patient was discharged with a proton pump inhibitor treatment. He consulted two days later complaining of persistent symptoms. Examination revealed pain on palpation of the right upper abdominal quadrant with no sign of peritonism.

The patient resides in Geneva and frequently travels to his home country. His occupation involves no risk of lead exposure.

Blood tests revealed a cholestatic liver abnormality and a hemolytic anemia with the hemoglobin level at 90 g/l. An abdominal ultrasound and a thoraco-abdominal CT scan proved normal. Serologies for HIV, cytomegalovirus, Epstein-Barr virus and hepatitis A, B, C were negative. A blood smear was performed and showed basophilic stippling that was highly evocative of a heavy metal poisoning. Blood and urinary lead levels were high at 80.8 mcg/dl and 208.8 mcg/g of creatinine, respectively. An increase in the urinary coproporphyrin III level up to 155.9 nmol/mmol ($n < 150$ nmol/mmol) was also noted.

The origin of the intoxication was discovered to be due to the patient taking Bhutanese traditional medicines to treat a resolute Bell's palsy a few months earlier. These medicines were composed



Figure 1. The analysis of the two pellets (0.5–1 cm Ø) showed the presence of a high level of lead on the surrounding red paint.

of parchment with ink writing and pellets (Figure 1). The patient thought the drug comprised hair of a deceased local priest with therapeutic virtues. The quantitative analysis performed at the University Centre of Legal Medicine (CURML) showed the presence of high level of lead on the red paint surrounding the pellets (1.4 mg in each pellet) and a negligible level in the parchment with ink writing (< 1 µg).

The patient was administered an oral chelation therapy with DMSA (dimercaptosuccinic acid) 10 mg/kg 3 times daily for 5 days, and then 10 mg/kg 2 times daily for 14 days.

The symptoms rapidly improved and the patient was discharged 5 days later from hospital with outpatient control by his general physician. He was advised to stop taking the poisonous medicines. The case was reported to the Bhutanese health authorities for them to address the issue locally and implement an appropriate health care response.

Discussion

Complementary and alternative medicines have become more frequent causes of lead poisoning in the past few decades. In 2007, a review article⁷ found 76 case reports dating from 1966 to 2007 that involved traditional medicines from the Middle East, South America and India (Ayurveda). It is estimated that at least 15% of ingested lead is absorbed⁷. Three main reasons explain the presence of lead in CAM medicines: involuntary contamination (e.g. soil where CAM plants grow), voluntary use of lead for therapeutic purposes and voluntary use of lead to increase the weight of medicines (the heavier the better)⁷.

As a consequence of general globalization in medicine, CAM medicines are being increasingly used in Western countries as they become more popular and easily available on the internet^{8,9,10}.

CAM medicines play a very important though underrated role in developing countries where they are more accessible and affordable than pharmaceutical drugs and where they are consequently estimated to be used by between 66–80% of the population¹¹. It must be noted that CAM encompass a broad range of practices with various degrees of popular recognition. In our case, it appeared that the ingested balls were not part of any of the officially recognized practices included in the Bhutanese traditional medicine known as gSo-Ba Rig-Pa¹², hence making resolution of the issue more complex. Patients often do not overtly disclose their consumption of CAM drugs for fear of lack of understanding by their doctor¹³. As a consequence the use and misuse of CAM medicines is certainly underreported.

Despite the body of literature on this topic, lead poisoning through CAM consumption remains a public health problem. Enhancing public awareness about the potential risks of many CAM approaches including exposure to harmful contaminants is a major objective

of preventative health care. Meanwhile, it remains the responsibility of the physician to obtain a detailed history of medication use, including in developed countries where lead exposure and poisoning can also be reported.

Consent

Written informed consent for publication of clinical details was obtained from the patient.

Author contributions

HM, SR, NP and OK were involved in the overall study design and protocol development. HM, SR and OK participated in writing the manuscript, which all authors have reviewed and approved.

Competing interests

No competing interests were disclosed.

Grant information

The author(s) declared that no grants were involved in supporting this work.

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Current Referee Status:

Referee Responses for Version 1



Bruno Mégarbane¹, Robert Garnier²

¹ Department of Medical and Toxicological Critical Care, Lariboisière Hospital, Paris-Diderot University, Paris, France

² Fernand Widal Hospital

Approved: 28 November 2013

Referee Report: 28 November 2013

The authors report an interesting case of lead poisoning following the administration of traditional remedies. This is a rather well-known situation, with several published cases, mainly occurring in the developing countries where traditional medicines are widely used. The case is well-written and discussed.

I have only minor comments:

1. Severe lead poisoning is responsible for abdominal pain which may be associated with nausea and/or vomiting but is generally preceded and associated with constipation. Was this patient constipated?
2. Hemolysis and cytolytic (rather than cholestatic) hepatitis are manifestations of subacute (or acute) lead poisoning; could the authors comment on their finding?
3. The clinical (and biological) course of this lead poisoning case could be better described, regarding the onset of renal complications, course of hemolysis and hepatitis, as well as blood lead concentration one or two weeks after chelation.
4. Arthralgia and myalgia are rare features of lead poisoning, as written in the introduction section. The main implications of lead poisoning are neurological (encephalopathy and peripheral neuropathy), hematological and renal (tubular nephropathy, then tubulo-interstitial and glomerular nephropathy).
5. In adults, digestive absorption of lead is poorer (5-10 %) than indicated in the discussion section.

We have read this submission. We believe that we have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Competing Interests: No competing interests were disclosed.



Arnaud Perrier

Department of Internal Medicine, University Hospitals of Geneva (HUG), Geneva, Switzerland

Approved: 25 November 2013

Referee Report: 25 November 2013

The authors report an interesting case of lead poisoning by a Bhutanese alternative medicine treatment. The interest resides in the frequency of complementary and alternative medicine (CAM) as a source of

accidental lead poisoning, a fact most physicians are not aware of. Also, the conclusion that CAM medications should be part of treatment history-taking is important and sound advice.

Minor points to be improved:

1. The reference interval for blood and urine lead level should be provided.
2. It would be interesting to know how the follow-up of such a case should be performed. At what intervals should lead measurements be repeated?

I have read this submission. I believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Competing Interests: No competing interests were disclosed.
