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A Case of Lead Poisoning, Presenting with Non-Specific Symptoms, In A Middle-Aged Male

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ABSTRACT

Lead poisoning, though increasingly rare in the developed world, remains a diagnostic challenge due to its nonspecific clinical presentation. This case describes a 35-year-old male presenting with non-specific symptoms , later diagnosed as chronic lead toxicity secondary to prolonged ingestion of a contaminated herbal medication. This report emphasizes the importance of a detailed history and high clinical suspicion in patients with unexplained anemia and gastrointestinal symptoms..

Keywords: Blood Lead Level , Aneamia, DMSA, Plumbism

INTRODUCTION

Lead is a heavy metal with no physiological role in the human body. It exerts toxic effects on multiple organ systems, notably the hematopoietic, gastrointestinal, renal, and nervous systems. Chronic lead exposure can result in significant morbidity, often with vague symptoms such as fatigue and abdominal pain. The use of unregulated herbal remedies continues to be a source of heavy metal exposure, particularly in developing nations.

Case Presentation

A 35 year old male patient who was a teacher by profession, and had history-of hypothyroidism reported with complaints of severe fatigue, colicky abdominal pain and bilateral pedal edema for 3 weeks and weight loss. On Physical Examination he had Mild bilateral pitting pedal edema, Pulse was 70/min, regular. Blood pressure was 124/80 mm of Hg. Jugular venous pressure was not elevated.
Systemic examination was within normal limits.

Initial Laboratory Investigations: - Hemoglobin: 11.2 g/dL - Platelet Count: 256,000/µL - Total Leukocyte Count: 8000/µL - Differential Count: N39%, L53%, M7%, E1% - ESR: 17 mm/hr -
Urinalysis: Normal - Serum Albumin: 5 g/dL - Serum Creatinine: 1 mg/dL - ALT: 52 U/L - TSH: 3.789 mIU/mL
Imaging: - Chest X-ray: Normal - Abdominal X-ray: No air-fluid levels
Peripheral Smear: - Normocytic, normochromic RBCs - Polychromatophilic cells - 2 normoblasts/100 WBCs

Follow-Up (1 week later): Symptoms persisted - Hemoglobin dropped to 9.3 g/dL - Platelet Count: 281,000/µL - Reticulocyte Count: 8.5% (Reference: 0.5 - 2.5%) - Coombs Test (Direct and Indirect): Negative - G6PD Level: Normal - Mantoux Test: Negative

Differential Diagnosis Considered: - Hemolytic anemia - Lead poisoning
Confirmatory Test: - **Blood Lead Level (BLL): 1001µg/L** - Reference for adults: <100 µg/L **(Figure 1 and 2)**

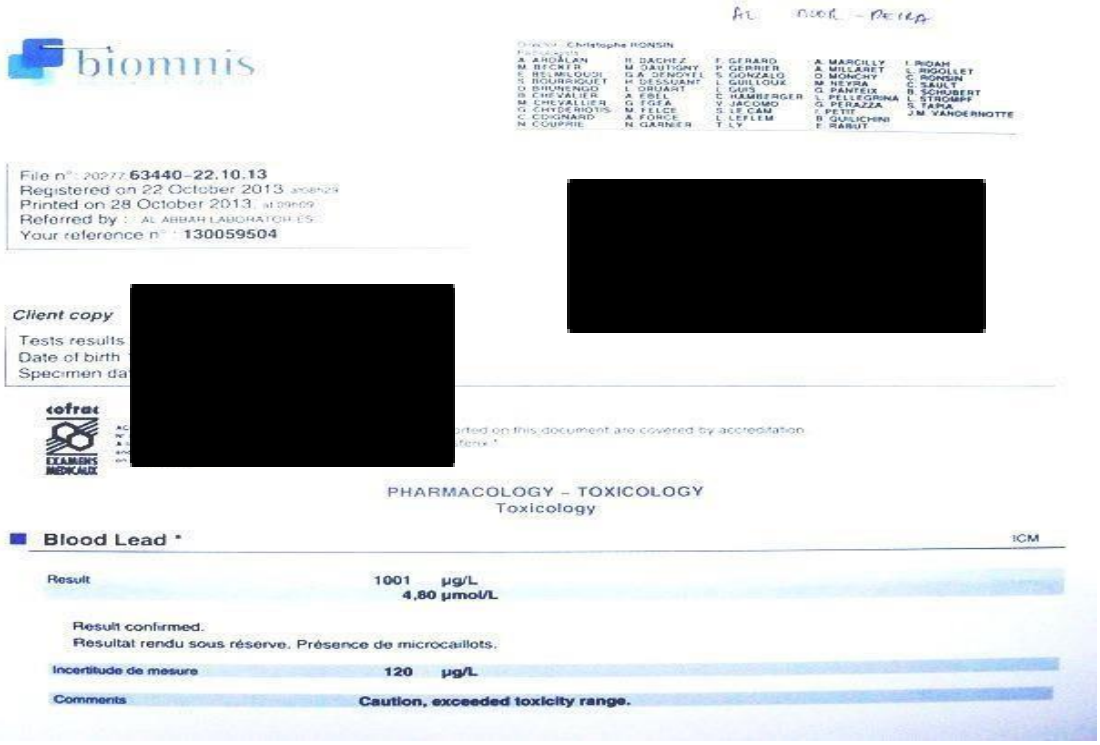

Figure 1 : Blood lead level

History Review: - Medical history was reassessed in order to identify the source of lead toxicity. The patient did not give any history of occupational exposure but revealed a history of taking some alternative medications for infertility. These medications taken by the patient were analyzed for lead content. (fig 2).A total of five medicines were analysed.They were labelled as sample A to E. Analysis revealed high content of lead in medications labelled as A and E. (figure 3 and figure 4 and Table 1)

Toxicology testing of the tablets revealed lead content of **64100 ppm** (6.41%) in sample A and **300 ppm** (0.03%) in sample E

Table 1: lead content in all samples

Sample	**Lead content**	**Limit**
A	6.41% (64100ppm)	Not more than 10ppm
B	<0.01ppm	Not more than 10ppm
C	<0.01ppm	Not more than 10ppm
D	<0.01ppm	Not more than 10ppm
E	0.03%(300ppm)	Not more than 10ppm

Figure 2: Medications taken by the patient for infertility

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TEST REPORT

Page : 1 of 1

Report No. : AU/2014/02/0025	Report Date : 06/02/2014
Issued to : [redacted]	Customer Reference: Letter
MD(Internal Medicine), Al Noor Polyclinic, Deira Dubai UAE	Date of Receipt : 05/02/2014
Sample Nature/ Name : SAMPLE-A	Date of Start of Test : 06/02/2014
	Date of Completion of Test : 06/02/2014
	Job Order No. : AU/2014/02/0025
Sample Condition : Satisfactory	Sample Particulars : NA

SL. No.	PARAMETERS	RESULTS	LIMITS (As per API Part II)	PROTOCOL
	Description	Brown coloured circular biconvex uncoated tablets filled in plastic bottle.		
1	Lead as Pb	6.41 %	Not more than 10.0ppm	AA - 7

64100ppm

Figure 3: Elevated lead level in sample A

Format No. BTH/QF/147 Revision Status : R1 Dt. : 15-09-2011

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TEST REPORT

Page : 1 of 1

Report No. : AU/2014/02/0029	Report Date : 06/02/2014
Issued to : [redacted]	Customer Reference: Letter
MD(Internal Medicine), Al Noor Polyclinic, Deira Dubai UAE	Date of Receipt : 05/02/2014
Sample Nature/ Name : SAMPLE : E	Date of Start of Test : 06/02/2014
	Date of Completion of Test : 06/02/2014
	Job Order No. : AU/2014/02/0029
Sample Condition : Satisfactory	Sample Particulars : NA

SL. No.	PARAMETERS	RESULTS	LIMITS (As per API Part II)	PROTOCOL
	Description	Silver coloured circular biconvex film coatd tablets packed in blisters.		
1	Lead as Pb	0.03 %	Not more than 10.0ppm	AA - 7

300ppm

Figure4: Elevated lead level in Sample E

Diagnostic Clues in this case : Normocytic anemia with elevated reticulocyte count - Negative Coombs test - History of alternative medication use - Markedly elevated blood lead level

Management

The patient was strictly instructed to discontinue the medications and was given oral chelation therapy for fourteen days with DMSA (dimercaptosuccinicacid) 10mg/kg thrice daily for 5 days and 10mg/kg twice daily for 14 days. After two weeks ,the patient was reviewed and showed symptomatic relief in the symptoms and his BLL showed a decrease in lead content.

Outcome and Follow-up: - Patient improved with cessation of exposure - Repeat BLL was planned to monitor clearance

Discussion

Alternative medicines may consist of herbs that are often intentionally combined with metals, such as lead, mercury, iron, and zinc, due to the belief that these metals contribute to their therapeutic disinfection .[1] Contrary to this belief, symptomatic lead toxicity following use of Ayurvedic medications has been reported repeatedly.[2-4]

For several years, cases of plumbism associated with ayurvedic medication have been published. The presence of heavy metals is not caused by accidental contamination but included in the belief that they have therapeutic capabilities. From 2000 to 2003, Centers for Disease Control reported 12 cases of lead poisoning in adults associated with ayurvedic medication intake occurring in five different states.[5] Some ayurvedic preparations have been found to contain lead and / or mercury at 100 to 10,000 times greater than acceptable limits.[6]

Adult lead toxicity can be categorized as either acute or chronic. Acute lead toxicity results from short-term, high dose lead absorption. Signs and symptoms often include normocytic or microcytic anemia, abdominal pain and constipation ("lead colic"), arthralgias and myalgias, and central nervous system impairment including headache, mood disorder and encephalopathy and can occur within weeks of the onset of sufficient exposure[7,9]. Chronic toxicity from lower doses of lead absorbed over longer durations results in more gradual increase in body burden and more variable symptoms, including decreased libido, impotence, infertility, anorexia, abdominal pain, weight loss, change in bowel habits, muscle weakness and pain, fatigue, depression, irritability, insomnia, paresthesias, headache, and nervousness.[10]

Lead inhibits heme biosynthesis, promotes hemolysis and shortens erythrocyte survival. This may eventually result in anemia, which is most often normochromic and normocytic. [11]The symptoms of lead toxicity may appear at a BLLs of 40-60 µg/dL in adults. [12]Anaemia may appear at blood lead levels higher than 50 µg/dL. [13] In adults, abdominal colic, involving paroxysms of pain, may appear at blood lead levels higher than 80 µg/dL.. [14]This patient manifested many of the known symptoms and signs of acute lead toxicity, including anemia, abdominal pain.

To date, there are no clinical trials that define the optimal management although it is accepted that the first step is to identify and remove the source of exposure. Chelation therapy should be initiated when the BLL is greater than 80ug/dL, and should be continued until the BLL is less than 50ug/dL. In this case, the patient was symptomatically better, after discontinuing the medicines and receiving oral chelation therapy .

Another paradox observed was that this patient was undergoing treatment for infertility, and the medications he was taking contained lead, which affects both male and female reproductive systems. In men, when blood lead levels exceed 40ug/dL, sperm count is reduced and changes occur in the volume of sperm, their motility and their morphology.[15] A pregnant woman's elevated blood lead level can lead to miscarriage, prematurity, and low birth weight. Lead is able to pass through the placenta and even into breast milk.

CONCLUSION

This case underscores the importance of considering lead toxicity in patients with unexplained anemia and abdominal pain. A detailed occupational and medication history, including herbal remedy use, is vital. Public awareness and regulation of alternative medicines are essential to prevent such toxic exposures.

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