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Original Article

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Chronic Lead Poisoning Secondary to Herbal Remedies- A Case Study

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ABSTRACT

Since 1920, there has been knowledge of the harmful effects that lead exposure has on humans. The issue of lead poisoning is not new. Scientists have known for more than a century that the naturally occurring metal can have catastrophic effects on physical and developmental processes but has no significant biological function that can promote human health. Lead toxicity, however, continues to be a problem for public health despite the knowledge of the harm it causes.

Conventional medicines may contain lead as an active ingredient or contaminant, and numerous incidents of poisoning in adults and children have been reported. These drugs can be used for a variety of conditions such as gastrointestinal disorders, skin disorders, infertility, erectile dysfunction, epilepsy, and diabetes, or they can be taken as tonics and aphrodisiacs. According to a report by NITI Aayog and the Council of Scientific & Industrial Research (CSIR), India is the country with the largest economic and health costs associated with lead poisoning.

Key Words: *lead poisoning, anaemia, lead colic, herbal remedies, chelation therapy*

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CASE PRESENTATION

History of Present Illness:

A 65 years old businessman residing at Kolkata got admitted with complaints of Loss of appetite, Pain in lower abdomen, Constipation, Generalised weakness and Weight loss for last 2 months. Abdominal pain was intermittent and colicky in nature and not associated with any vomiting. Constipation was unrelieved even after taking several laxatives. Patient almost lost 10 kg of weight over last 2 months. Patient had no history of fever, cough, bleeding P/R and joint pain. There was no history of alcohol intake, smoking and family history had no significant contributions.

Past History:

Patient was diagnosed with Type 2 Diabetes mellitus 6 months back, for which he was taking some herbal medications. He was also on anti hypertensive medication(Telmisartan 40mg) and medications for hypothyroidism for which he was taking (Tab.Thyroxine 100mcg).For his symptoms he underwent upper GI endoscopy and CECT whole abdomen as advised by his general physician.Upper Gastro Intestinal Endoscopy revealed esophageal candidiasis with duodenal ulcer (Picture 1).CECT W/A-Shows normal study except mild hepatomegaly.

He was treated with antifungal & Proton Pump Inhibitors by the local physician but his symptoms were not relieved so he was admitted in our hospital for further work up.

Picture 1: Features of Esophageal candidiasis

Examination at admission with investigations:

Patient was conscious, cooperative during admission although patient looked little depressed and lethargic. Vital signs:- BP-150/80 mm of Hg,Pulse-90/min, Temperature-98.6°F, Respiratory rate(RR)-20/min. General physical examination revealed mild pallor but no cyanosis, jaundice, clubbing or oedema. Abdominal examination showed abdomen soft and non tender. Other systemic examination revealed no abnormality.

ROUTINE INVESTIGATION

DATE	11/02/22	15/02/22	17/02/22	18/02/22	24/02/22
Hb(gm/dl)	7.5	6.7	6.4	6.2	6.7
TLC(/cumm)	9300	6800	18100	6900	7600
NEUTROPHILS(%)	80	80	89	85	70
MCV(fl)	81	82	85	83	83
PLATELET COUNT	400	300	250	210	310
CREATININE (mg/dl)	1.42	1.33	1.68	1.41	1.10
TOTAL BILIRUBIN(mg/dl)	2.7	2.2	2.2	2.0	1.30
SGOT	39	105		75	
SGPT	38	37		65	
ALP	114	39		127	
ALBUMINE	4.25	3.72		3.34	

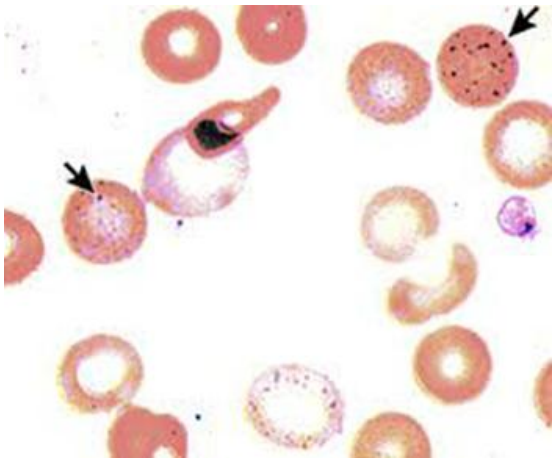
SPECIAL INVESTIGATION

SERUM IRON	95
SERUM FERRITIN	926
VITAMIN B12	325
RETICULOCYTE COUNT	7.7%
LDH	224
COOMBS TEST	(NEGATIVE)
STOOL FOR OBT	(NEGATIVE)
SPEP	NO M BAND SEEN
Kappa/lambda ratio	0.98
ANA	(NEGATIVE)
P/C- ANCA	(NEGATIVE)
URINE R/E	ALBUMIN+,PUS CELL:(2-4)

Colonoscopy	Within normal limits

Further investigations were done which included Bone marrow biopsy as a part of anaemia workup, which revealed basophilic stippling with erythroid hyperplasia(Picture2). So we went back to the history and as the patient had a history of herbal medication intake for 4 months as a treatment for type2 diabetes mellitus, therefore, heavy metal poisoning was

suspected. Blood for lead level was sent and it showed 65 microgram/dl.Patient was therefore having symptoms of chronic lead poisoning manifested as anaemia, renal insufficiency, constipation, pain abdomen(lead colic).



Picture 2: Peripheral blood smear of the patient showing a picture of microcytic hypochromic anaemia with basophilic stippling of the red blood cells(arrow)

Management and Follow-up:

In our case, patient had blood lead level >45 mcg/dl with pain abdomen, myalgia, generalized weakness &nephropathy. So our patient was an ideal candidate for chelation therapy, and we started with d-Penicillamine 250mg 4 times daily.

During Hospital stay, patient's haemoglobin dropped to 6.4 gm/dl for which one unit of packed red blood cell was given.After one month on follow up his blood lead level came down to 40mcg/dl, and his haemoglobin increased to 9.5 gm/dl and creatinine dropped to 0.9 mg/dl.

On Follow up after 2 & 4 months, blood lead level gradually came down to 30mcg/dl and 20mcg/dl respectively, Haemoglobin went up to 13.5 gm/dl, Creatinine was 0.8 mg/dl and patient became clinically asymptomatic.

DISCUSSION

Nearly half of the 2 million lives lost in 2019 as a result of exposure to known chemicals, according to the World Health Organization's 2021 update of Public health impact of chemicals: knowns and unknowns, were caused by lead exposure. According to estimates, lead exposure causes 21.7 million years of disability-adjusted life years (DALYs) lost due to disability and death worldwide, contributing 30% of the burden of idiopathic intellectual disability, 4.6% of the burden of cardiovascular disease, and 3% of the burden of chronic kidney diseases [1,2,3].

BLOOD LEAD LEVEL

- **Normal Blood Lead Level:- <5 mcg/dl**
- **Definition of Elevated Blood lead level:- ≥ 5mcg/dl**
- **Adult lead toxicity :- Mean BLL:- ≥ 10mcg/dl**
- **When BLL >80 mcg/dl symptoms are most likely,**
- **BLL 40-80 mcg/dl symptom less severe and variable**
- **BLL <40 mcg/dl usually asymptomatic.**

TAKE HOME POINTS FROM THIS CASE

Indigenous herbal remedies have the potential to cause chronic lead poisoning, which results in recognizable symptoms, indicators, and laboratory characteristics. A strong index of suspicion and asking about prior drug use, are crucial for diagnosis. Chelation therapy and removing the source of the poisoning are essential treatment methods.

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2. End of leaded fuel use a "milestone for multilateralism" press release https://news.un.org/en/story/2021/08/1098792, (2021).
3. WHO Fact sheet on Lead poisoning (31st August,2022)

SUGGESTED FURTHER READING:

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DISCLOSURES

Contributors: SM was the Consultant, Chief Supervisor and head of the unit; AD and SM were involved in the daily management of the patient; AMS did the academic contributions.

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