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Lead Toxicity among Oral Opium Addicts with Abdominal Pain: A Case Series of 17 Cases

Esmaeil Farzaneh[1], Afshin Habibzadeh[1], Omid Mehrpour [2, 3]

[1]Department of Internal Medicine, Ardabil University of Medical Sciences, Ardabil, Iran, [2]Atherosclerosis and Coronary Artery Research Center, Birjand University of Medical Sciences, Birjand, Iran, [3]Medical Toxicology and Drug Abuse Research Center (MTDRC), Birjand University of Medical Sciences, Moallem Avenue, Birjand, Iran

ABSTRACT

Objective: Lead toxicity is a common health problem worldwide. It is usually occupational but sometime non-occupational toxicities are reported. Opium-related lead toxicity has been reported in recent years. Here we evaluated common clinical findings among oral opium addicts with proven lead toxicity.

Methods: We evaluated 17 cases of opium addict male patients (mean age of 49.82±11.52 years) with abdominal pain and anemia visiting Imam Khomeini Hospital, Ardabil, Iran during April and May 2016. Clinical manifestations, laboratory findings and treatment outcome were studied.

Results: The duration of addiction was 14.58±7.46 years. Mean lead level was 93.36±27.84 µg/dL (48.4-144 µg/dL). All patients had anemia, abdominal pain and reduced appetite. Common manifestations were irritability and sleep disturbance (76.5%), fatigue (70.6%), Constipation (64.7%), vomiting (58.8%), abdominal cramp (52.9%) and muscle weakness (29.4%). Basophilic stippling was seen in 11 out of 17 cases. All patients were treated with D-Penicillamine 250 mg three times a day and significant improvement of symptoms was observed during the first week of treatment. **Conclusion:** In conclusion, Lead poisoning should be considered in patients with a history of opium abuse who present with abdominal pain and anemia. Proper treatment should be initiated for these patients.

Keywords: *Lead toxicity, Opium, Addiction, Abdominal pain, Treatment.*

INTRODUCTION

Lead is available in the environment widely [1-4]. Lead poisoning is a medical condition caused by occupational or environmental exposure to sources of inorganic lead. The most common sources are lead-containing paint, water, leaded pipes from public water supply, Asian herbal remedies, lead-glazed ceramics, and lead shot game [5].

Corresponding author:
Omid Mehrpour MD
Medical Toxicology and Drug Abuse Research Center (MTDRC), Birjand University of Medical Sciences, Moallem Avenue, Birjand, 9713643138 Iran.
Email: omid.mehrpour@yahoo.com.au

Opium addiction is one of the most prevalent forms of addiction in Iran [6]. It has been shown that adulteration of lead in opioids could result in severe lead toxicities [4, 7]. There are various case reports and case series regarding lead poisoning due to opium use [8-15].

Lead is toxic to multiple organ systems and can have a variety of presentations including abdominal pain, constipation, irritability, and anemia. Fatigue, myalgia, arthralgia, renal failure, and neurologic deficits may also be seen [5, 16].

Lead exposure occurs mainly through the respiratory and gastrointestinal systems. It is reported that lead is available in opioids used in Iran. It is still unknown whether it is added to it during the process of opium preparation or it is added to increase the opium weight during opium trading [6]. Most reports regarding

opium related lead toxicity were before 2010. There was a rise in the cases of acute persistent abdominal pain among oral opioid users in our region. We hypothesized possible lead toxicity and here we report a case series of opioid related lead toxicity.

MATERIAL AND METHOD

In this case study, we evaluated all oral opioid users presenting with acute and persistent abdominal pain visiting Imam Khomeini Hospital, Ardabil, Iran during April and May 2016. Patients who had noted GI pathologies as a cause of abdominal pain, and patients who were occupationally placed at the setting of increased lead level were excluded. We also included only those cases with admitted oral opioid use. The protocol of study was approved by the Ethics Committee of Ardabil University of Medical Sciences. Authors adhered to Helsinki declarations during the study period.

Demographic data, duration of opioid use, lead toxicity manifestations or symptoms including constitutional, gastrointestinal and musculoskeletal as well as laboratory findings were recorded. Results were reported using descriptive analysis.

FINDINGS

Here we report 17 cases of lead toxicity presented with abdominal pain. All cases were male and oral opium addict. Eight patients were first evaluated by surgeons and gastroenterologist for acute abdominal pain causes and even 3 cases had undergone laparatomy with normal findings. The duration of addiction was 14.58±7.46 years. Patients' laboratory and clinical presentation findings are shown in table 1. Their mean age was 49.82±11.52 years. Mean lead level was 93.36±27.84 µg/dL with the minimum and highest level of 48.4 and 144 µg/dL. All patients had anemia, abdominal pain and reduced appetite. Common manifestations were irritability and sleep disturbance (76.5%), fatigue (70.6%), Constipation (64.7%), vomiting (58.8%), abdominal cramp (52.9%) and muscle weakness (29.4%). Other manifestations included aggressiveness and headache each in 17.8% and HTN crisis, numbness and memory loss in 11.8%. Peripheral blood smear were evaluated for all patients and basophilic stippling was reported in 11 out of 17 cases.

With the presumption of lead toxicity as the possible cause of abdominal pain in these patients, all were treated with d-Penicillamine 250 mg three times a day and during the first three days of treatment the symptoms were improved and after 1 week patients were free of pain. Patients continued treatment for 14 days. Patients were advised to either quit their habit or change the source of opium supply.

DISCUSSION

In recent years occupational lead poisoning as the main cause of lead toxicity has decreased, but new non-occupational causes have emerged [17]. In Iran opioids adverse effects is a major concern in recent decades[18-20]. Meanwhile, opium related lead toxicity has been reported in several case reports [8-15].

Lead is toxic to multiple organ systems and can have a variety of presentations. Common signs and symptoms of lead toxicity are mostly gastrointestinal-related including colicky abdominal pain (lead colic), constipation, anorexia, nausea as well as other organ related symptoms of joint pain, muscle aches, headaches, decreased libido, sleep disturbance, irritability, fatigue, anemia, nephropathy, confusion, encephalopathy, and seizures [5, 16, 21].

Opium related lead toxicity is usually present with abdominal pain and anemia. Opium addicts usually have constipation. Acute abdominal pain has a broad differential diagnosis and in addict patients presenting with abdominal pain along with main possible diagnosis, lead poisoning should be considered as another differential diagnosis [22].

In the last few months there was increased rate of acute and persistent abdominal pain among addicts in our region which increased the possibility of lead poisoning. We evaluated clinical and laboratory findings of 17 opium addict patients with the presentation of abdominal pain and with proven lead toxicity.

Unrecognized lead poisoning can be misdiagnosed and may lead to unnecessary gastrointestinal evaluations and even abdominal surgery. Among our cases, few patients had undergone laparatomy or other aggressive gastrointestinal evaluations, but the pain was still persistent.

The diagnosis is made with a blood lead level. However, we begun the treatment before preparation of laboratory results and due to the clinical symptoms. All

our patients had abdominal pain and anemia indicative of possible lead toxicity. Also, basophilic stippling was reported in almost half our patients. It is reported that basophilic stippling of erythrocytes may be seen on peripheral blood smear, but this is not always present [16].

Blood Lead levels in our patients ranged between 48.4 and 144 µg/dL (mean level of 93.36±27.84 µg/dL). A variety of symptoms were observed in our case series. Previous studies have mentioned that presentation of the symptoms is not related to the blood lead level. The appearance of clinical manifestations of lead poisoning is dependent on the acuity, age and individual variations [23].

Many of the toxic effects of lead are reversible if lead poisoning is identified early and exposure to the source of contamination removed. Elimination of the source of exposure should be the first step in the treatment of lead poisoning. Then, chelators are used to facilitate the excretion of lead from the body. It is reported that oral chelator therapy should be initiated in cases with blood lead levels < 40 µg/dL, cases with 40-79 µg/dL should be referred for prompt medical evaluation and in cases with blood lead levels more than 100 µg/dL parentral chelator therapy should be started in the hospital [24]. We advised all patients to stop using opioids during the treatment and they were given methadone 5 mg three times a day to prevent withdrawal effects. All patients received d-Penicllamine three times a day and all symptoms were improved following the treatment. The results of blood lead levels were came during the treatment and due to the observed response to treatment, it was not changed.

CONCLUSION

In conclusion, lead poisoning should be considered in any adult with a history of opium abuse who present with abdominal pain or altered mental status and anemia.

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Table 1. Patients' laboratory and clinical presentation findings of Lead toxicity resulting from chronic ingestion of opium

Cases	Age	Hb	Lead level (µg/dL)	Abdominal pain	Abdominal cramp	constipation	Reduced appetite	vomiting	Aggressiveness	Headache	Irritability	HTN crisis	numbness	Memory loss	Sleep disturbance	Muscle weakness	fatigue
1	69	10.5	68	+	-	-	+	-	-	-	-	-	-	-	+	-	-
2	46	9.1	95	+	+	-	+	+	-	-	+	-	-	-	+	-	+
3	30	9.7	112	+	+	+	+	+	+	-	+	-	-	-	+	-	+
4	56	9.9	56	+	-	-	+	-	+	-	+	-	-	-	+	-	+
5	39	8	122	+	+	+	+	+	-	-	+	-	-	-	+	-	-
6	62	8.5	89	+	-	+	+	-	-	-	+	+	-	-	+	-	-
7	51	8.2	117	+	+	+	+	+	-	-	+	-	-	-	+	+	+
8	49	10.2	67	+	-	-	+	-	-	-	+	-	-	-	+	-	-
9	64	9.4	71	+	-	+	+	-	-	-	-	+	-	+	-	-	+
10	39	8.6	86	+	-	+	+	+	-	+	+	-	-	-	+	-	+
11	40	8	132	+	+	+	+	+	+	+	+	-	-	-	+	+	+
12	41	8.2	144	+	+	+	+	+	-	-	+	-	+	+	+	+	+
13	38	9.5	75	+	-	-	+	-	-	-	-	-	-	-	-	-	+
14	54	8.6	92	+	+	+	+	+	-	-	+	-	-	-	+	+	+
15	63	8.8	124	+	+	+	+	+	-	+	+	-	-	-	+	+	+
16	43	10.9	88	+	+	+	+	+	-	-	+	-	+	-	-	-	-
17	63	9.2	48.4	+	-	-	+	-	-	-	-	-	-	-	-	-	+

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