A Case of Severe Mercury Intoxication with Unknown Source

Kaynağı Bilinmeyen Şiddetli Bir Civa İntoksikasyon Vakası

Civa Zehirlenmesi / Mercury Intoxication

Meşide Gündüzöz[1], Ceylan Bal[2], Murat Büyükşekerci[3], Özge Han[4], Engin Tutkun[5]
[1]Department of Family Medicine, Occupational Diseases Hospital, [2]Department of Biochemistry, Occupational Diseases Hospital,
[3]Department of Pharmacology, Occupational Diseases Hospital, [4]Department of Pathology, Güven Hospital,
[5]Department of Toxicology, Occupational Diseases Hospital, Ankara, Turkey

Özet

Makalemizde 43 yaşında civa maruziyeti olan erkek bir hastayı sunduk. Hastanın ilk muayenesinde; şiddetli uyku bozukluğu, kilo kaybı, metalik tat hissi ve ciddi tat bozukluğu gibi non-spesifik semptomlar saptandı. Civa maruziyet kaynağı saptanamadı fakat hasta hastaneye başvurmadan 10 gün öncesine kadar Çin Tıbbına ait kaynağı bilinmeyen çeşitli bitkisel ilaçları düzensiz olarak kullandığını ifade ediyordu ve uzun yıllardır dumansız tütün (Maraş Otu) kullanıcısıydı. Hastanın civa şelasyon tedavisi devam ederken, timoma saptandı ve timektomi uygulandı.

Anahtar Kelimeler

Civa; Bitkisel İlaç; Timoma

Abstract

In our article we presented a 43 year-old mercury exposed male. In his medical examination, we found non-specific symptoms like severe taste disorder, metallic taste in mouth, weightloss, severe sleep disorders. Origin of mercury exposure could not be detected, but the patient reported irregular usage of various herbal medicine with unknown source, belonging to Chinese Medicine, until ten days before admission and was also a user of smokeless tobacco (Maraş Powder) for long years. During chelation therapy for mercury intoxication, thymoma was diagnosed and thymectomy wa sapplied.

Keywords

Mercury; Herbal Medicine; Thymoma

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Corresponding Author: Ceylan Bal, Osmangazi Mah. Atlılar sok. No:45 06280 Keçiören, Ankara, Türkiye.
GSM: +905057458438 F.: +90 3125808404 E-Mail: ceylandemirbal@gmail.com

Introduction

Mercury is a heavy metal of known toxicity. Human toxicity varies with the form, dose and rate of mercury exposure. It can adversely affect many systems predominantly central and peripheral nerve system [1]. As a result, various manifestations of clinical features can be seen in exposed patients. Chronic and high-dose acute mercury exposed individual may experience rather vague and non-specific symptoms that could be indicative of a number of diseases [2].

Human exposure to mercury is mostly caused by outgassing of mercury from dental amalgam, ingestion of contaminated fish, or occupational exposure [3]. In the literature there has been some cases with undetectable origin of mercury exposure [4].

Here in, we present 43-year-old male of unknown origin mercury exposure with non-specific symptoms.

Case Report

Clinical Evaluation

A 43 year-old male patient presented with severe taste disorder and weight loss. He reported progressive symptoms, initially began with loss of bitter and finally sweet taste sensation. Also, he had a disturbance of metallic taste in mouth. In the past 6 months, the patient was complaining from severe sleep disorders. His weight loss was 10 kg for one year period. In neurological examination, only horizantal nystagmus and (+) Romberg was found. Electromyographic findings were normal. In Nuclear Magentic Resonance (NMR) imaging of brain, non specific signal alterations, including isodence lesions on T1-weighted images, hyperdense on T2-weighted images, were found. In physical examination of tongue, papillary atrophy was not inspected, but 4 amalgam fillings were seen. In routine laboratory examination, hepatic and renal function parameters and electrolyte, autoantibody, complement and immunoglobulin levels were found to be normal.

In the chest radiography, upper mediastinal widening and homogeneous density in the right mediastinum localised retrosternally was reported by radiologists. In thorax computarized tomography, 93 x 60 mm, with definite margins, lobulated mass (thymoma ?) was characterized (Figure 1). In the abdominal ultrasonography, a 28 mm hipodens lesion (hemangioma) was detected. On the 7th day of chelation therapy, the patient was operated and thymoma was surgically removed with open thoracotomy. The pathological examination revealed the diagnosis of Type B1 thymoma. Microscopic examination of sections from the mass showed an encapsulated tumor tissue comprised of many lobules of variable size seperated by thin fibrous septa were seen. A few epithelial cells without atypia among abundant lymphocytes resembling normal thymic tissue (Figure 2a). The epitheliel cells did not form cellular agregats or sheets...There were numerous scattered pale medullary foci in tumor tissue. (Figure 2b). Diagnosis was accepted as thymoma, type B1

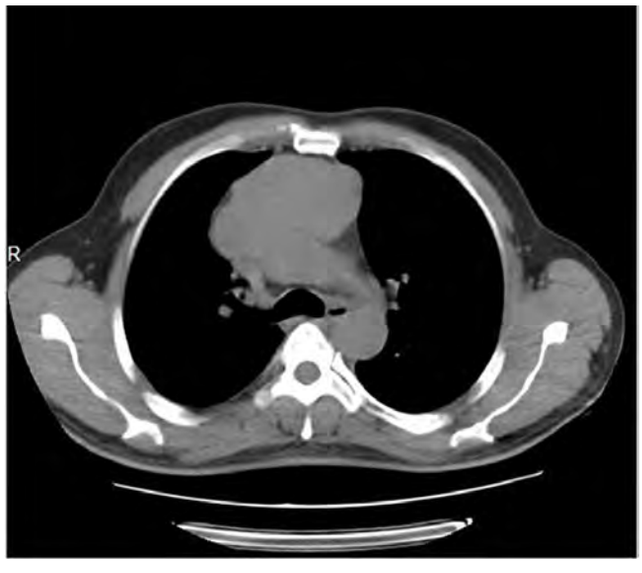


Figure 1. Thorax CT : 93 x 60 mm, with definite margins, lobulated mass (thymoma ?)

Toxicological laboratory analysis, including urinary solvent parameters (phenol, mandelic acid, metilhippuric acid, , trichloroacetic acid, 2-5 Hexanedione) were within normal range. In toxic metal analysis (Table 1); urine concentration of total chromium was 16.3µg/L. The concentrations of the mercury in urine and in blood were 1724 µg/L (1289 µg/gr creatinine) and 275 µg/L, respectively. These values were higher than proposed biological exposure indices by American Conference of Governmental Industrial Hygienists (ACGIH-USA).

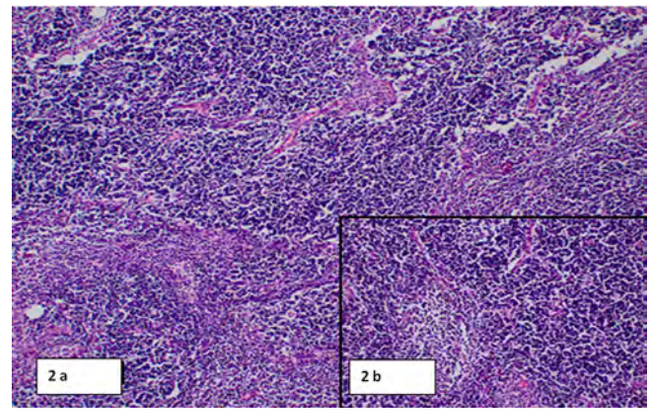


Figure 2. A few epithelial cells without atypia among abondant lymphocytes resembling normal thymic tissue (H&Ex100)(A). Pale staining medullary differentiation foci (H&Ex100)(B).

Table 1. Urinary and Whole Blood Toxic Metal Levels

Urinary toxic metal	Measured values	Biological Exposure Index*
Mercury (ug/g creatinine)	1289	35
Arsenic (ug/L)	25,52	35
Chromium (ug/L)	16,33	10
Whole blood metal	Measured values	Biological Exposure Index*
Mercury (ug/L)	275	15
Cadmium (ug/L)	0,1	5

*Cited from ACGIH 2011

Exposure History

Probable sources of mercury exposure were asked to the patient. There was no history of occupational exposure or accidental contact. One month prior to addmission, there was no history of fish eating. The patient reported using smokeless tobacco (Maras Powder) which is a traditional habit widely seen in Southeastern Region of Turkey for long years. The patient also reported using various herbal medicine irregularly with unknown source, belonging to Chinese Medicine, for ten days before admission.

Medical Treatment

Chelation therapy with intravenous (2,3-dimercaptopropane-1-sulfonate (DMPS) was initiated with 100 mg twice a day dose regimen. The excretion of mercury was monitored with 24 hour urine and blood mercury levels (Figure 3). On the 7th day of therapy, chelation was stopped because of surgical operation for thymoma. The chelation therapy was re-started on 21st day with 100 mg three times a day orally and continued for 20 days.

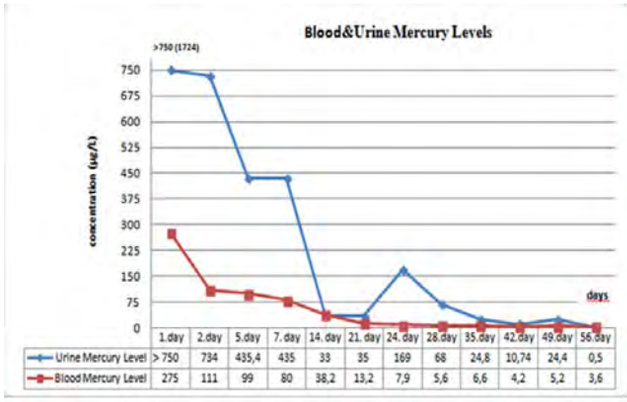


Figure 3. Blood and urinary mercury levels in chelation therapy

Discussion

Mercury, which exists as organic and inorganic forms, is a well-known heavy metal because of its toxic properties . Besides occupational exposure, many other types of exposure have been reported in the literature [4].Due to herbal medicine use in patients' history, toxic metal was measured in biological specimen.In literature, toxic metal exposure have been reported in Chinese herbal and Ayuverdic medicine many times. [6,7].The concentrations of the mercury in urine and in blood were 1724 µg/L (1289 µg/gr creatinine) and 275 µg/L ,respectively,

There are only a few mercury intoxication cases with such mercury levels in the literature. Erkek N. et al [8] reported that a 10 year old girl had been referred to hospital with gastroenterological symptoms and later her blood and urine mercury concentrations were 5380 µg/L and 91 µg/L respectively. Urine mercury concentration of a patient who was poisoned with metalic mercury vapour in England was measured as 1213 ug/g creatinin by Forman J et al. [9].

In the literature, we couldn't find any publication which relates mercury exposure to thymoma. Mercury exposure has been known to effect immune system, but the exact relation is obscure. Mercury exposure alter human immun system either by increasing or decreasing the immune activity where this effect depend on individiuals' genetic predisposition. [10,11]. Further studies should be done which investigates the relationship between immune system, thymoma and mercury exposure.

In our case, the source of mercury exposure could not be identified thoroughly. The mercury levels of family members and work friends were measured and found to be within normal range. There was no clue, even after repeated questioning of family members. The most suspicious source of exposure was smokeless tobacco (Maras Powder).Maras Powder or Nicotiana rustica Linn is composed of powder form of wild tobacco plant and ashes of oak, walnut and vine stems, with a ratio of one-half or one-third. In traditional use, a small amount of this mixture is packaged with cigarette rolling paper and put into space between lower lip and gingiva. Then, it is spat out. This application is repeated continously during all day and it is known that, in case of severe addiction, some people sleep with this powder. It is produced by villagers of rural areas of Southern Region of Turkey [12,13]. In the vicinity, it is known that, in the absence of stem ash, producers use "coke coal ashes" in low quality and cheap production series. It is strongly probable that, in the near past use of patient, he was exposed to mercury from such kind of low quality production [14,15].

As a conclusion, there many common, but also extreme sources of mercury exposure and mercury intoxication should be remembered in the presence of different symptoms by the clinician.

Competing interests

The authors declare that they have no competing interests.

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