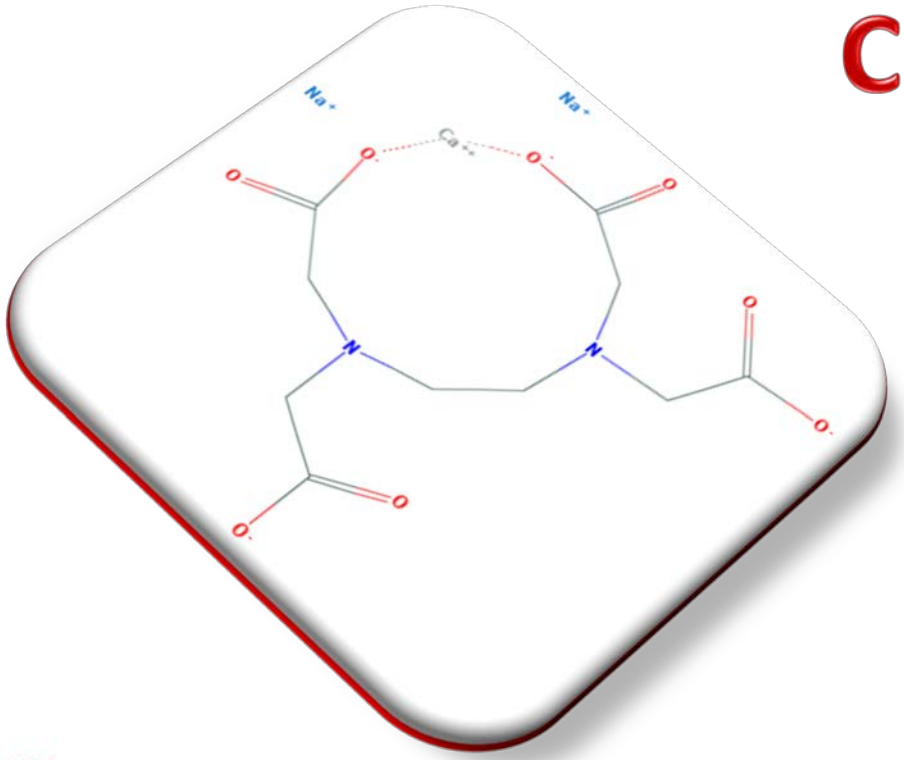
EDETATO CALCICO DISODICO

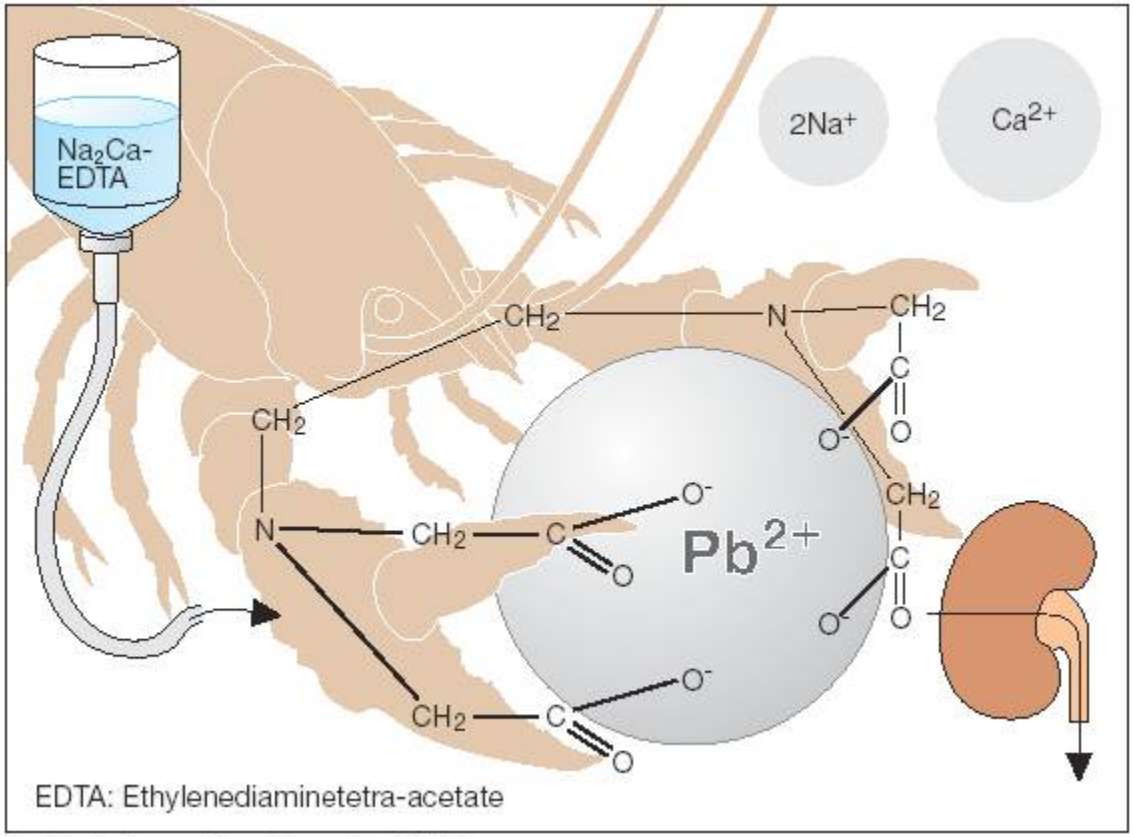
$CaNa_2EDTA$



Núria Corominas

S. Farmacia Hospital Clínic Barcelona

EDETATO CALCICO DISODICO, $CaNa_2EDTA$



Antagonista de metales pesados que quela plomo

EDETATO CALCICO DISODICO

Alta afinidad por el metal tóxico

Baja toxicidad

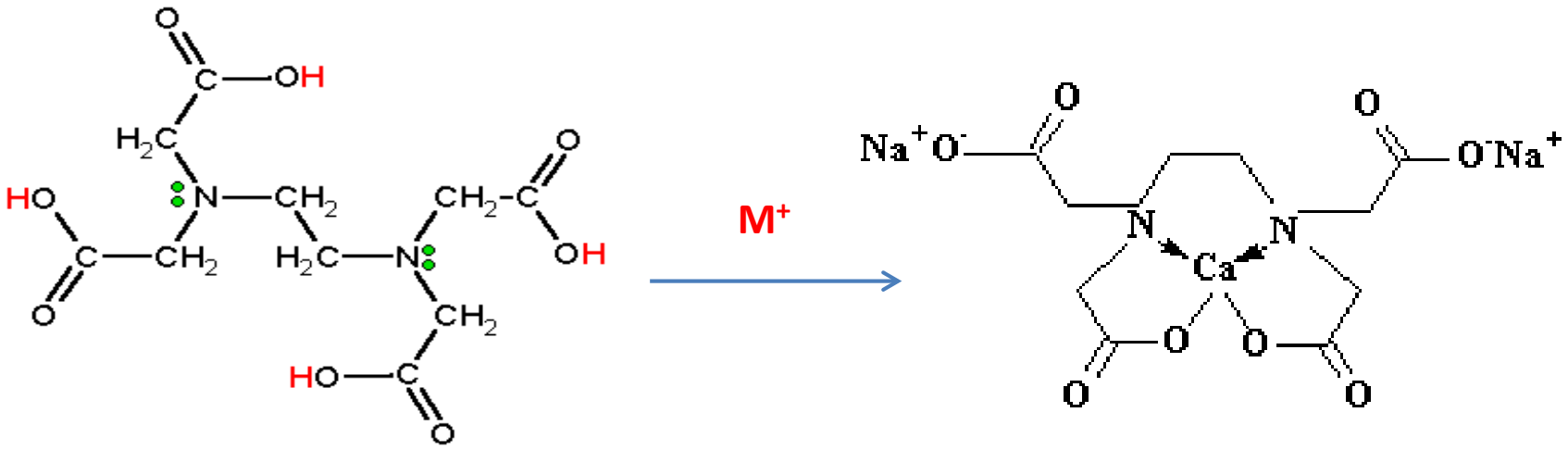
Mínimo metabolismo

Rápida eliminación del metal

Penetración intracelular

Buena absorción por el tracto GI

EDETATO CALCICO DISODICO, $CaNa_2EDTA$ (ETILENDIAMINOTETRAACETATO DE CALCIO Y DISODIO)



- 1935: EDTA se sintetiza en Alemania por el químico F. Münz
- 1950: Edetato cálcico disódico se autoriza para uso médico en EEUU

EVIDENCIA CIENTIFICA

...Años 50

Effects of Calcium Disodium Versenate ($CaNa_2EDTA$) Moderate Childhood Lead Poisoning

Morri E. Markowitz, MD; Polly E. Bijur, PhD; Holly Ruff, PhD; and John

ABSTRACT. ***Background.*** **For children with asymptomatic moderate lead poisoning (Blood lead level [BPb] 25 to 55 µg/dL [1.21 to 2.66 µmol/L]), treatment with the chelating agent calcium disodium versenate ($CaNa_2EDTA$) is recommended for all those children with a BPb level >45 µg/dL (2.17 µmol/L) and for those with a BPb level of 25 to 44 µg/dL (1.21 to 2.13 µmol/L) who also have a positive lead mobilization test. However, controlled studies demonstrating its efficacy at inducing a sustained reduction in BPb level or lead-related toxicity have not been performed in children with moderate lead poisoning. This study assesses the relationship between $CaNa_2EDTA$ chelation and measures of lead burden and toxicity in children with moderate lead poisoning.**

ABBREVIATIONS. $CaNa_2EDTA$, BPb, blood lead; LMT, lead mobilization test; EP, erythrocyte protoporphyrin; LXRF, Lα-x-ray fluorescence; CNET, corrected net counts; HES, home environment scale.

The introduction of chelation therapy in the 1940s for the management of symptomatic lead poisoning resulted in decreased mortality.[1] The combined use of the chelating agents British Antilewisite and calcium disodium versenate ($CaNa_2EDTA$) further improved outcomes.[2] From the 1960s onward, the institution of mass screening of high-risk children, coupled with the reduction in allowable concentra

TREATMENT OF CHRONIC LEAD-POISONING WITH CALCIUM DISODIUM VERSENATE

BY

A. C. MARKUS, B.M., B.Ch.

AND

A. G. SPENCER, M.D., M.R.C.P.

(From the Medical Unit, University College Hospital, London)

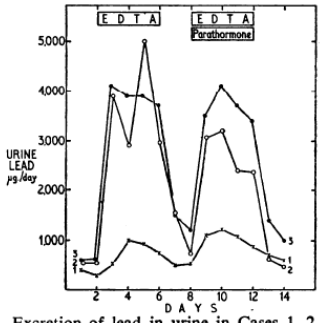
The treatment of lead-poisoning by the use of intravenous calcium disodium ethylenediamine tetra-acetic acid (E.D.T.A.; versenate) has been described by several authors in America, both in children (Byers and Maloof, 1954; Bessman *et al.*, 1952, 1954; Karpinski *et al.*, 1953) and in adults (Belknap, 1952; Sidbury *et al.*, 1953; Hardy *et al.*, 1954). The first report from this country has been published recently (Giles *et al.*, 1955). All authors agree that treatment with versenate gives prompt relief from the distressing symptoms of lead-poisoning.

Calcium disodium versenate is a synthetic chelating agent that removes lead from the body by the formation of a soluble non-ionized lead complex which is excreted in the urine. The pharmacology and mode of action of versenate are described in detail by Karpinski *et al.* (1953).

In chronic lead-poisoning lead is stored in the bones, and this may subsequently be released by infection or the central nervous system other than a coarse tremor of the hands. Before treatment he was observed to have several attacks of colicky pain in which the abdomen became rigid.

Laboratory Tests.—Hb, 80%. Punctate basophil count, 11,200 per million red blood cells. Urine: albumin +; sugar 0; no excess of amino-acids. Qualitative tests for coproporphyrins ++. Blood urea, 48%; urea clearance, 106%. Urine lead, 400 and 300 µg. a day.

Two four-day courses of versenate were given, separated by two rest days. Dosage: 2 g. of versenate dissolved in one litre of normal saline given intravenously over nine hours (0.3 g./30 lb. (13.6 kg.) body weight a day). Parathor-mone, 150 U.S.P. units a day intramuscularly, was given during the second course. The excretion of lead in the urine is shown in the Chart. The headaches, tremor, and colic were rapidly relieved. The lead colic returned on the third day of para-thor-mone injections, but was again relieved within 30 minutes of starting the versenate drip, and did not return. The excess urine coproporphyrins had disappeared by the end of treatment.



Excretion of lead in urine in Cases 1, 2, and 3.

Two months later the patient said that he still felt better than he had for years, and had gained

Acute Lead Poisoning In an Infant

M. Madhusudhanan,[1] S.B. Lall [2]

Abstract

A case of acute lead poisoning in an infant without overt clinical manifestations of encephalopathy is reported for the first time in Oman. The case was diagnosed at Rustaq Hospital on the basis of (i) history by the mother of giving the child a traditional remedy for treating constipation (ii) X-ray of abdomen showing radio-opaque speckles and (iii) detection of high blood lead levels (83.3 µg/dL) at the toxicology laboratory of the poison control centre. The source of lead was confirmed by high content of inorganic lead (20.2%) found in the sample of the traditional remedy (bint al dahab). The blood lead levels significantly decreased, after the intravenous calcium edetate (EDTA) therapy was given to the baby. The case highlights that early detection and treatment of acute le in children can prevent morbidity and sequelae ass encephalopathy. It also indicated the need for aw prevention programme for parents on this issue.

Received: 17 April 2007
Accepted: 26 September 2007
From [1]Laboratory Medicine, Rustaq hospital, South Batinah Regio Control Centre, Directorate of Environmental Health and Malaria E Ministry of Health.
Address correspondence and reprint request to: S.B. Lall. [2]Poiso Centre, Directorate of Environmental Health and Malaria Eradicati Ministry of Health.
E-mail: shyamlall@hotmail.com

Introduction

Acute lead poisoning in children is uncommon and is

Case Report

A two month Omani male infant was referred from a

Toxicology and Industrial Health 2009; **25**: 137–1
http://tih.sagepub.co

Successful treatment of extreme acute lead intoxication

J Mikler[1], P Banovcin[1], M Jesenak[1], J Hamzikova[1] and D Statelova[2]

[1]*Department of Pediatrics, Jessenius School of Medicine, Comenius University in Bratislava, University hospital in Martin, Martin, Slovak Republic*
[2]*Department of Stomatology and Maxilofacial Surgery, Comenius University in Bratislava, University hospital in Martin, Martin, Slovak Republic*

Severe acute lead intoxications are rare and are associated with accidental or purposeful ingestion. There were only few cases of severe to fatal poisonings reported in literature in children. We report a case of acute lead intoxication in a child with extremely high lead blood level of 20.4 µmol/L (422.7 µg/dL), who was treated with chelation and in whom significant organ dysfunction did not develop. Documented significant high level above 3.37 µmol/L (corresponding to 70 µg/dL) in this patient persisted for approximately 24 h. Adequate, single or combined chelatation therapy in early phase of acute lead poisoning is essential for the further patient's outcome. *Toxicology and Industrial Health* 2009; **25**: 137–140.

ELSEVIER DOYMA
MEDICINA CLINICA
www.elsevier.es/medicinaclinica

Nota clínica

Brote de saturnismo asociado a un tratamiento basado en la medicina ayurvédica

Sara Fernández [a], Gerónimo-Antonio Pollio [a], Verónica Domínguez [a], Santiago Nogué [b,*], Mercè Torra [c] y Francesc Cardellach [a]

[a] *Servicio de Medicina Interna, Hospital Clínic, Barcelona, España*
[b] *Sección de Toxicología Clínica, Hospital Clínic, Barcelona, España*
[c] *Sección de Toxicología Analítica, Hospital Clínic, Barcelona, España*

INFORMACIÓN DEL ARTÍCULO

Historia del artículo:
Recibido el 6 de septiembre de 2013
Aceptado el 12 de septiembre de 2013
On-line el 20 de febrero de 2014

Palabras clave:
Saturnismo
Intoxicación por plomo
Medicina ayurvédica

RESUMEN

Fundamento y objetivo: El saturnismo es una enfermedad de causa tóxica que es producida, habitualmente, por la inhalación repetida de plomo en un ámbito laboral. Pero este metal puede también ser absorbido por vía digestiva. En medicinas alternativas, como la ayurvédica, el plomo puede formar parte de algunos tratamientos y ser causa de intoxicación.
Pacientes y método: Se recogen los casos de saturnismo atendidos y tratados en el Hospital Clínic de Barcelona en relación con un tratamiento ayurvédico.
Resultados: Se han incluido 2 mujeres de 45 y 57 años que iniciaron un tratamiento ayurvédico que comprendía la ingesta de diversos medicamentos. El primer caso desarrolló anemia y dolor abdominal. La plumbemia fue de 74 µg/dl y la protoporfirina eritrocitaria de 163 µg/dl. Fue tratada con etilendiaminotetraacetato de calcio y disodio ($CaNa_2EDTA$) intravenoso y posteriormente con ácido dimercaptosuccínico (DMSA) oral, con buena evolución. El segundo caso presentó dolor abdominal y un ribete de Burton. La plumbemia fue de 52 µg/dl y la protoporfirina eritrocitaria de 262 µg/dl. Fue tratada con DMSA oral, evolucionando favorablemente. Las concentraciones de plomo en algunas de las pastillas

JKMS
CASE REPORT
Occupation & Environmental Medicine
https://doi.org/10.3346/jkms.2017.32.10.1713 • *J Korean Med Sci* 2017; 32: 1713-1716

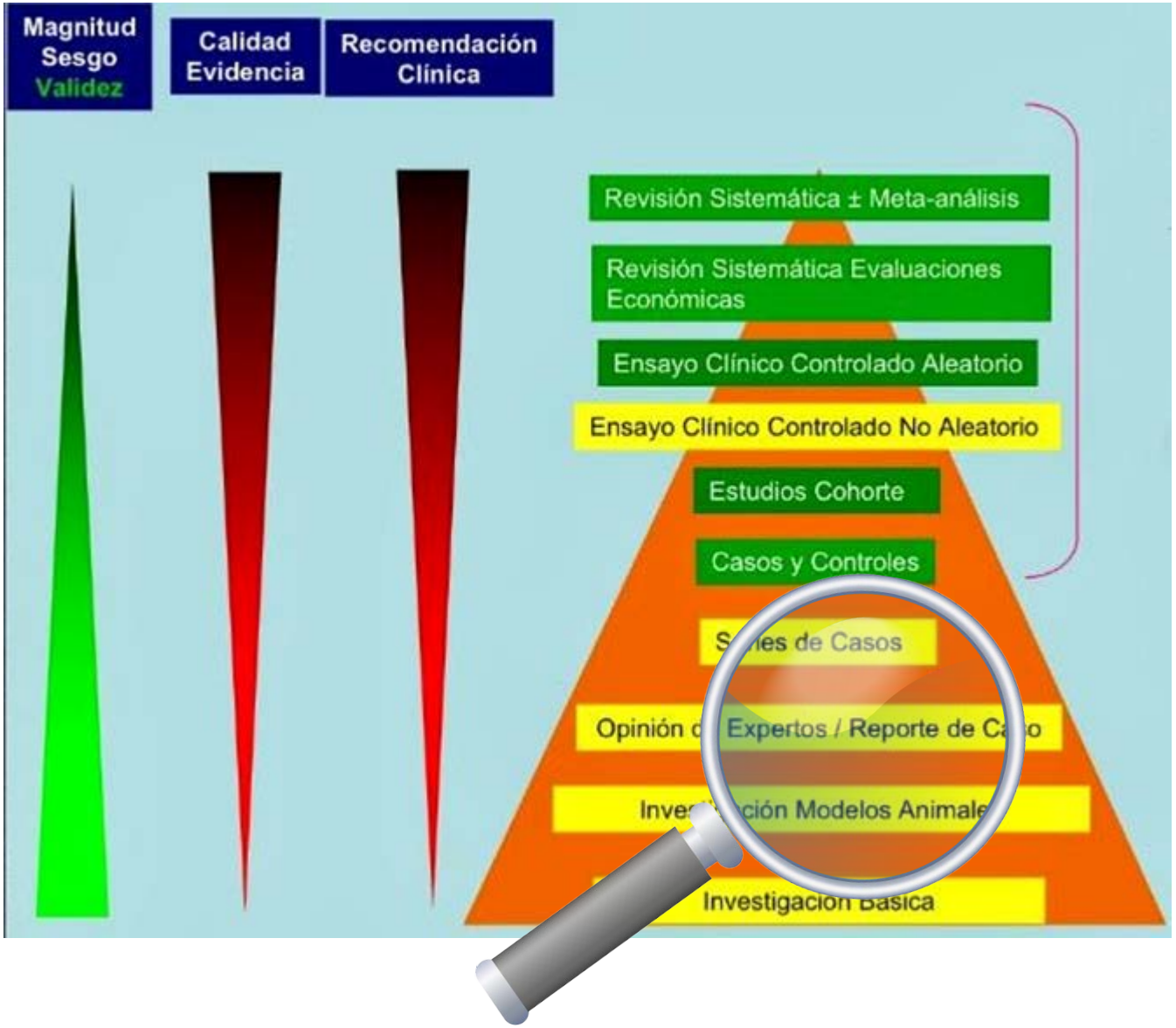
Lead Poisoning at an Indoor Firing Range

Kyung Wook Kang[1,2] and Won-Ju Park[3,4]

[1]Department of Neurology, Chonnam National University Hospital, Gwangju, Korea; [2]Department of Neurology, Aerospace Medical Center, Republic of Korea Air Force, Cheongju, Korea; [3]Department of Occupational and Environmental Medicine, Chonnam National University Hwasun Hospital, Hwasun, Korea; [4]Department of Occupational and Environmental Medicine, Aerospace Medical Research Center, Republic of Korea Air Force, Cheongju, Korea

Received: 2 February 2016
Accepted: 2 June 2016

In March 2014, a 39-year-old Korean male presented with a 6-month history of various nonspecific symptoms including dizziness, fatigue, asthenia, irritability, elevated blood pressure, palpitation, eyestrain, and tinnitus. His occupational history revealed that he had been working as an indoor firing range manager for 13 months; therefore, he was subjected to a blood lead level (BLL) test. The test results showed a BLL of 64 µg/dL; hence, he was diagnosed with lead poisoning and immediately withdrawn from work. As evident from the workplace environmental monitoring, the level of lead exposure in the air exceeded its limit (0.015–0.387 mg/m^3). He received chelation treatment with calcium-disodium ethylenediaminetetraacetic acid (1 g/day) for 5 days without any adverse effects. In the follow-up results after 2 months, the BLL had decreased to 9.7 µg/dL and the symptoms resolved. This report represents the first occupational case of lead poisoning in firing ranges in Korea, and this necessitates institutional management to prevent the recurrence of poisoning through this route. Workplace environmental monitoring should


Magnitud
Sesgo
Validez
Calidad
Evidencia
Recomendación
Clínica
Revisión Sistemática ± Meta-análisis
Revisión Sistemática Evaluaciones Económicas
Ensayo Clínico Controlado Aleatorio
Ensayo Clínico Controlado No Aleatorio
Estudios Cohorte
Casos y Controles
Series de Casos
Opinión de Expertos / Reporte de Caso
Investigación Modelos Animales
Investigación Básica

Presentación

Amp 500 mg/10 mL

Dosificación

- **Adultos**

1g /12 h durante 5 días (max. 75 mg/kg/dia)

- **Niños**

Si [Pb] sangre >70 mcg/dl: 35 a 50 mg/Kg/día, c/12h durante 5 días.

Si [Pb] sangre = 45-70 mcg/dl: 25 mg/kg/dia

Encefalopatía: administración IM, 250 mg/m^2/4h durante 5 días conjuntamente con dimercaprol

Forma de administración IV

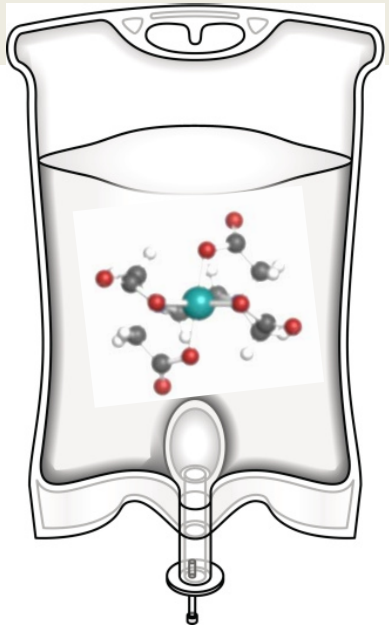
1g en 500 mL de SSF o SG5% a pasar en 6 h. (Concentración máxima: 5 mg/mL)

Contraindicación

Anuria, enfermedad renal activa, hepatitis

Butlletí d'antídots de Catalunya. Nº1. febrer-maig.2018 www.redantidotos.org

EFECTOS ADVERSOS



- Episodios febriles, malestar general, vómitos, cefaleas,

(*Relacionados con una velocidad de perfusión demasiado rápida*)

- Hipotensión transitoria
- Congestión nasal i lagrimeo
- Glucosuria
- Leve elevación de concentración sérica de AST y ALT

- Arritmias cardíacas, cambios en ECG, tromboflebitis

(*Relacionados con una concentración de la infusión iv >5 mg/mL)*)

- Nefrotoxicidad: necrosis tubular renal

(*Relacionado con dosis mayores a las recomendadas)*

- Excreción de metales esenciales como Fe, Mg o Zn

(*Relacionado con tratamientos crónicos)*

FARMACOCINETICA

- Absorción: Oral <5%
- Inicio de acción: quelación del Pb en 1h, vía endovenosa
- Distribución: Fluido extracelular
  (*mínima penetración en SNC*, aprox. 5%)
- Metabolismo: metabolización insignificante
- Semivida de eliminación: 20-60 minutos
- Excreción: urinaria

DMSA (Succimero)

Indicación: Toxicidad por Hg i Pb

Dosificación:

10 mg (350 mg/m^2)/kg/8h, durante 5 días por semana

DMPS

Indicación: Toxicidad por Hg i Pb

EDTA Redistribution of Lead and Cadmium Into the Soft Tissues in a Human With a High Lead Burden – Should DMSA Always Be Used to Follow EDTA in Such Cases?

Walter J. Crinnion, ND

Abstract
Intravenous sodium calcium ethylene diamine tetra acetic acid (EDTA) and oral 2,3-dimercaptosuccinic acid (DMSA) have both been used to reduce the burden of lead in humans. Each of these agents enhances the mobilization of lead from different areas of the body – EDTA from the trabecular bone and DMSA from the soft tissue. A study of Korean battery workers revealed that EDTA appeared to increase the soft tissue burden of lead, resulting in increased levels of aminolevulinic acid and greater subsequent lead mobilization with DMSA. This case report discusses a patient with a higher-than-normal lead burden who exhibited increased tissue lead burden after intravenous EDTA. The elevated tissue burden of lead was still present, albeit lower, after five consecutive days of oral DMSA therapy. If this single case is representative of a typical human response to the use of intravenous (IV) EDTA for lead, then it suggests that all persons undergoing such treatment should be administered oral DMSA for a minimum of one week after EDTA treatment.
(Altern Med Rev 2011;16(2):109-112)

Sodium calcium ethylene diamine tetra acetic acid (EDTA) has been the main therapeutic agent for lead poisoning for the last 50 years. It is generally administered intravenously (IV) because it is poorly absorbed from the gastrointestinal tract following an oral dose[3] and because intravenous administration has been shown to accelerate lead excretion. Trabecular bone lead appears to be the prime target for IV EDTA.[4] One concern with EDTA for lead chelation is the possibility that some of the lead will be redistributed from bone to soft tissue targets like the brain or kidneys.[5]

2,3-Dimercaptosuccinic acid (DMSA) is also a lead chelator and, like EDTA, has been used to treat lead intoxication. It is thought to be effective in removing lead from soft tissue and the blood, but to be ineffective for chelating bone lead.[5] Redistribution of lead from bone to soft tissue targets is not thought to occur with DMSA.[5]

Changes in blood lead levels following EDTA are

Table 1. Results of Heavy Metal Testing of Five Ayurvedic Products

Metal (ppm)	1GB	4P	2ST	3LT	5TIP
Al	471	1,027	3731	60.3	96.1
As	7.28	0.829	99.9	1.53	<dl
Cd	0.487	0.442	5.94	0.079	0.076
Pb	8.71	7.54	56,185	10.49	1.12
Hg	21.9	4.66	6,333	6.81	0.574
Ni	2.79	5.45	11.8	0.269	1.68
Th	0.01	0.017	0.017	<dl	<dl
Sn	609	0.935	256.4	0.624	0.035

dl = detection limit

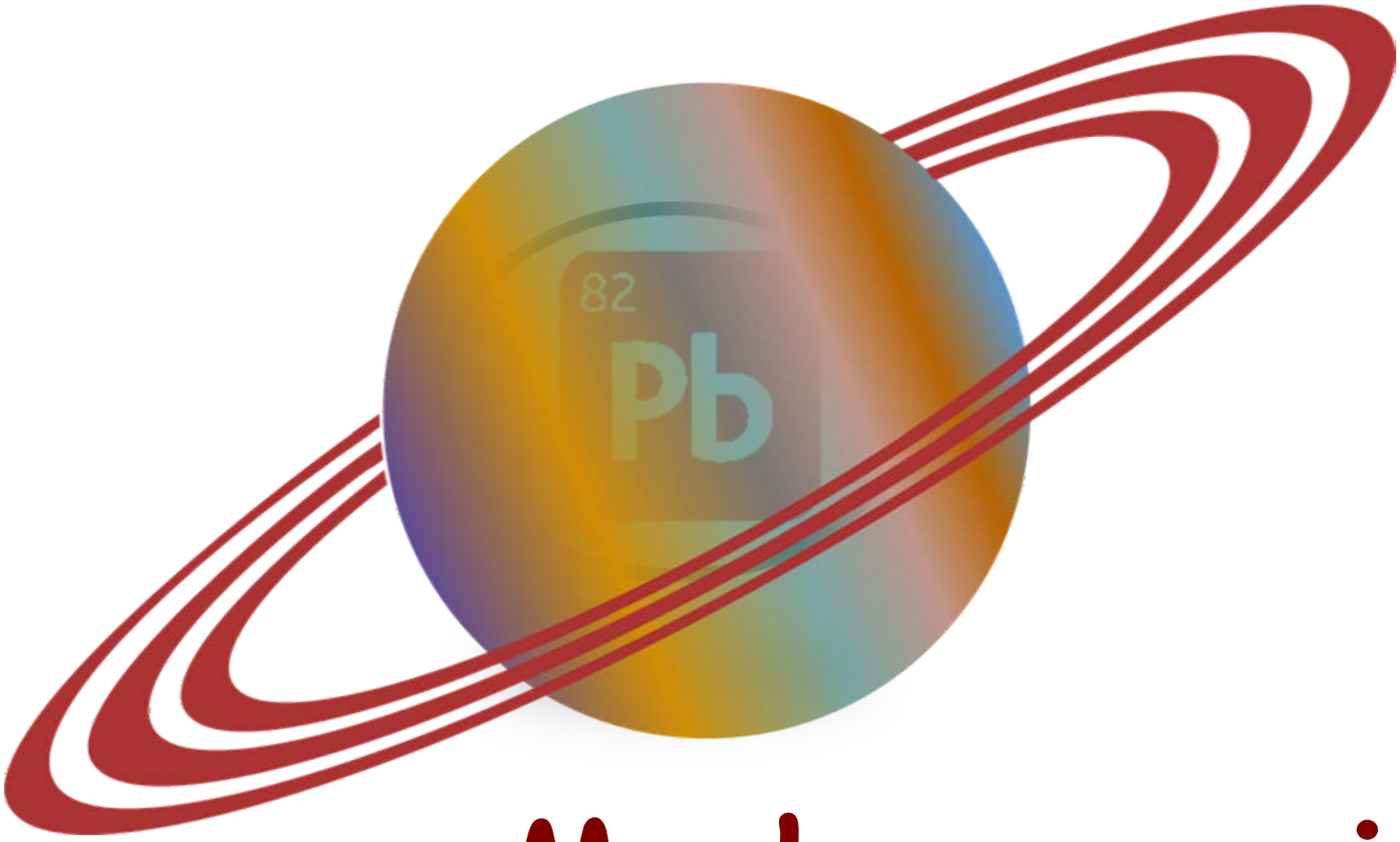
Crinnion W. Altern Med Rev 2011;16:109-112

CONCLUSIONES

Una amplia experiencia, de mas de 60 años, avala el uso de edetato cálcico disódico en la intoxicación por plomo mostrando contundencia de resultados favorables

El edetato cálcico disódico posee un buen perfil de seguridad si se respetan las recomendaciones de uso establecidas

DMSA se considera una alternativa a edetato cálcico disódico en circunstancias en donde la terapia oral se considere oportuna



Muchas gracias