



Artemisia Herba -Alba Severe Intoxication Case

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ABSTRACT :

Chih is widely used in traditional medicine in the Mediterranean Sea against several pathologies, including diabetes, colds, coughs, intestinal disorders.

We will report a case of a 74-year-old man that presented an acute kidney failure due to the ingestion of massive quantities of artemisia 's infusion

The exact mechanism, the component and the minimal dose that led to these still questions on the table

Key-words: acute renal failure, Artemisia herba-alba, osmotic nephrosis, ICU, Chih, white wormwood

Introduction:

The white wormwood (Chih), is a perennial shrub in the genus Artemisia that grows commonly on the dry steppes of the Mediterranean regions in Northern Africa (Saharan Maghreb), Western Asia (Arabian Peninsula) and Southwestern Europe (1).

Artemisia herba-alba« Chih » is a Common medicinal herb in Algeria. It is used in folk medicine as an anthelmintic, antispasmodic, antirheumatic, and antidiabetic agent (2). Many other species are used in Afro-Asian countries.

According to the World Health Organization (WHO) data, 80% of the world's population choose traditional medicines to meet their healthcare needs (3). It's due to the public opinion that judges it safe.

Case report:

We will report the case of a 74-year-old male that was admitted to our ward on April, 20th with a severe kidney failure with serum creatine at 51 g /L with oliguria 0.14cc/kg/h severe hyponatremia 109meq/L and franc hematuria.

It's a patient with a medical history of diabetes type II under metformin 850 mg for the past 20 years, benign prostatic hyperplasia and chronic ingestion of infusion of artemisia herba alba (2500mL /day). Add in it all daily drinks as coffee, tea... during 1 month.

On April 18th, he had fever, asthenia, anorexia, and bilateral lumbalia and anuria. So, he had a urinary catheterization that quantified a hematuria of 200/mL.

On physical examination, the patient presented jaundice, a blood pressure of 100/70 mmHg, and an oliguria of 200 mL/24 hours.

Pelvic ultrasounds were performed that didn't find any signs of bladder bleeding

Thorax radiography was normal. The AKG showed a sinusal rhythm of 68bpm

Blood gas at the admission showed a metabolic acidosis with pH =7.11 HCO₃⁻= 4.9 Pco₂ = 16 lactate was not available.

Serology: HBV, HCV, leptospirosis and HIV were negative

Biological checklist: (tab)

Hypoalbuminemia at 19 and hypocalcemia 68 meq /l

The rest of biology was unremarkable.

He was put under ciprolon and claforan at the admission and was dialyzed 6 times, resuscitated, transfused with 8 CUP and 5 GC during his hospitalization

The nephrologists labelled the kidney failure as an acute tubule-nephropathy that led to a kidney failure

In the case of our patient, no cause of acute tubular injury was found (shock, medicine intoxications).

The patient died due to severe hyperkalemia 8meq/l, with hypotension at 70/40 and hyperglycemia up to 4g/l

Discussion:

Artemisia herba-alba belongs to the Asteraceae family. It is a perennial, silvery greenish dwarf shrub that grows in arid and semi-arid climates in the North Africa, and the Middle East (4).

It's used in traditional medicine against: diabetes, colds, coughs, intestinal disorders, and in the treatment of human and livestock injuries (5) ...

The essential oil of this plant is well studied for its antibacterial, antifungal, anti-acetylcholinesterase, and also antiproliferative (6-7). The known renal effect of Artemisia herba-alba is a diuretic effect (8)

literature reported mild hydropic degeneration in proximal convoluted tubules in rabbits and mice having an aqueous extract of Artemisia herba-alba (0.39 g/kg) (9). Also was reported small fatty vacuoles in the cells of the renal proximal convoluted tubules in rats fed on a diet consisting of 10% Artemisia (10).

The same lesions were reported in 2010 in a similar case from Monastir due to an aqueous extract (two cups a day for two consecutive days) of Artemisia herba-alba. (11)

We didn't perform a kidney biopsy for our patient. However, the clinical and biological similarities and the fact that they both presented an acute tubular necrosis (where the biopsy is not usually practiced)

Artemisia herba-alba, essential oil contains in majority: cis-chrysanthenyl acetate (25.12%); 3,5-heptadienal- 2-ethyliden-6-methyl (8.39%); α -thujone (7.85%); myrtenyl acetate (7.39%); verbenone (7.19%), chrysanthenone (4.98%) (12) which has an effect on oxidative stress by its strong antioxidant activity due to its major phytochemical compounds chrysanthenone and camphor, which may act as singular oxygen and hydrogen donors (13.14)

In our clinical report, the patient was drinking huge amount of an aqueous extract of Chih which may lead to an unsteadiness of the oxidative balance. The blood gas can comfort this possibility since it showed a metabolic acidosis on a tubular necrosis.

Conclusion:

There is no study that determinate neither the component of Chih in charge of the acute tubulopathy nor the exact mechanism of it. However, the hypothesis of the effects it antioxidative agents on tubular function can be highlighted to explain the mechanism of the nephropathy.

The question that still remains is at what dose, Chih leads to kidney injuries.

	16/4	18/4	20/4	21/4	22/4	23/4	24/4	25/4	26/4	27/4	29/4
hb		11.74	10.1	9.2	8.4	9		6.9	6.7	7.9	
plq		67	11	16	7	10		32	54	65	
gb		10.96	20.63	14.2	20.45	17.59		15	16.5	13.51	
uree	0.62	0.88	2.04	2.36	2.64	2.59	3.81	2.74		2.93	3.9
creat	9	15.5	51	94	58	54	78	56		60	72
asat			45		110	99	29.43				
alat			18		5.47	4.76	12.9				
tp			65		69						
tck			25		27						
Na+		120	109	109	110	117	119.1	131.3		137.2	134
K+		3.66	4.54	5.04	5.47	6.6	6.79	4.44		5.6	7.56
crp		117	2.56	213	162	162		93.74			
gly	1.94		1.94	2.56	2	2.06	3.18	2.5		4.56	
bt			81		89		45.24	47.71			
db			76		82		40.31	44.96			

Tab: biological checklist of the patient before and during the hospitalization

Bibliography:

1. Phytogeographical and cytogeographical history of Artemisia herba-alba (Asteraceae) in the Iberian Peninsula and North Africa: mirrored intricate patterns on both sides of the Mediterranean Sea Youcef Bougoutaia, Teresa Garnatje, Joan Vallès, Meriem Kaid-Harche, Ahmed Ouhammou, Mostefa Daria, Abderrazak Tlili and Daniel Vitales. Botanical Journal of the Linnean Society, 2021, 195, 588–6
2. Artemisia herba alba: A Popular Plant with Potential Medicinal Properties December 2012 Pakistan Journal of Biological Sciences 15(24):1152-9 DOI:10.3923/pjbs.2012.1152.1159

3. WHO. WHO Traditional Medicine Strategy 2014–2023; World Health Organization: Geneva, Switzerland, 2013; Available online: https://www.who.int/medicines/publications/traditional/trm_strategy14_23/en/ (accessed on 23 January 2021)
4. Vernin, G.; Merad, O.; Vernin, G.M.F.; Zamkotsian, R.M.; Parkanyi, C. GC-MS analysis of *Artemisia herba alba* Asso essential oils from Algeria. In *Developments in Food Science*; Elsevier: Amsterdam, The Netherlands, 1995; Volume 37, pp. 147–205. ISBN 0167-4501.
5. Bailey, C.; Danin, A. Bedouin Plant Utilization in Sinai and the Negev. *Econ. Bot.* 1981, 35, 145–162
6. Tilaoui, M.; Mouse, H.A.; Jaafari, A.; Aboufatima, R.; Chait, A.; Zyad, A. Chemical Composition and Antiproliferative Activity of Essential Oil from Aerial Parts of a Medicinal Herb *Artemisia Herba-Alba*. *Rev. Bras. Farmacogn.* 2011, 21, 781–785.
7. Younsi, F.; Trimech, R.; Boulila, A.; Ezzine, O.; Dhahri, S.; Boussaid, M.; Messaoud, C. Essential Oil and Phenolic Compounds of *Artemisia Herba-Alba* (Asso.): Composition, Antioxidant, Antiacetylcholinesterase, and Antibacterial Activities. *Int. J. Food Prop.* 2016, 19, 1425–1438.
8. Marrif HI, Ali BH, Hassen KM. Some pharmacological on *Artemisia herba-alba* (Asso.) in rabbits and mice. *J. Ethnopharmacol.* 1995; 49:51–55.
9. Adam SEI, Al-Qarawi AA, Elhag EA. Effects of various levels of dietary *Artemisia abyssinica* leaves on rats. *Lab Anim.* 2000; 34:307–312.
10. Zeggwagh NA, Farid O, Michel JB, Eddouks M. Cardiovascular effect of *Artemisia herba-alba* aqueous extract in spontaneously hypertensive rats. *Methods Find Exp Clin Pharmacol.* 2008;30(5):375–381.
11. An exceptional case of acute renal failure: is there a renal toxicity of *Artemisia herba-alba*? Sabra Aloui, Hbib Skhiri, Ahmed Ltaief & Mezri Elmay, 32:8,1009-1011, DOI: 10.3109/0886022X.2010.501932
12. Bezza L, Mannarino A, Fattarsi K, Mikail C, Abou L, Kaloustian J. Composition chimique de l'huile essentielle d'*Artemisia herba-alba* provenant de la région de Biskra (Algérie). *Phytothérapie.* 2010; 8:277–81
13. Prophylactic effects of Wormwood on lipid peroxidation in an animal model of lead intoxication O. Kharoubi, M. Slimani, A. Aoues, and L. Seddik *Indian J Nephrol.* 2008 Apr; 18(2): 51–57.doi: 10.4103/0971-4065.4233
14. *Artemisia herba-alba* Essential Oils: Chemical Analysis, Antioxidant Potential and In Vivo Anti-Inflammatory, Analgesic Activities, and Acute Toxicity El Ouahdani, K.; Es-safi, I. Mechchate, H.; Al-zahrani, M.; Qurtam, A.A.; Aleissa, M.; Bari, A. Boust, *Molecules* 2021, 26, 6780. <https://doi.org/10.3390/molecules26226780>.