

## Glue thistle: a cause of an acute kidney injury

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**Abstract:** *The ingestion of the gummifera Atractylis plant or glue thistle, common in the Mediterranean area, causing an intoxication which is characterized by the diversity of its affections mainly by a liver damage often lethal. Renal damages remain less frequent. We report the case of a suicide attempt by glue thistle with an acute kidney failure requiring dialysis and hepatic impairment with good evolution.*

*The toxicity of Atractylis gummifera resides in atractyloside and carboxyatractyloside, capable of inhibiting mitochondrial oxidative phosphorylation and responsible of cellular toxicity of various organs, especially renal impairment, the acute tubular necrosis remains the most likely etiology. The diagnosis is carried by the toxins research in the gastric fluid or the urine.*

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### I. Introduction

The glue thistle, its Latin name *Atractylis Gummifera* is a plant belonging to the Asteraceae family, which lives in North Africa: Morocco, Algeria and Tunisia), minor Asia and Southern Europe, (1) Known for its lethal toxicity, it is most commonly ingested accidentally by children or by pregnant women in an abortion attempt (2). We report the case of glue thistle intoxication at Elghassani intensive care unit in Fez, Morocco, by focusing on the renal damage caused by this poisoning.

### II. Clinical case

Mr EM, aged 48, who is known to be suffering from a bipolar syndrome under no treatment, is admitted to the emergency department of the Elghassani hospital unconsciousness. The family reports the notion of taking an Addad plant (Thistle) for the attempt of suicide, 24 hours earlier.

On admission, the physical examination reveals a patient with a Glasgow score of 13, polypneic, with a blood pressure at 140 / 90mmhg, heart rate at 90b / min, a temperature of 36.5 ° C, there is no abnormality in auscultation, the abdomen is soft, the patient is anuric.

The biological check-up done in the emergencies shows blood glucose at 0.8, hepatic cytolysis (ALAT: 240 U / L, ASAT at 260 U / L), advanced renal failure with hyponatremia (urea at 1.37 g / L, creatinine at 103mg / L, low sodium at 128 mmol / L, serum potassium at 4.6 mmol / L), the prothrombin level is unclotted. Hemoglobin: 10.6, platelets: 119,000, white blood cells: 27.530.

The renal ultrasound shows kidneys of 13.5cm on both sides with a hyperechoic aspect of the cortex and pyramids protrusion.

After conditioning, the patient is admitted to the Intensive care unit (ICU), placed under rehydration by a saline serum of 0.9% depending on the blood volume, and perfusion of 30% glucose serum, he is putting under furosemide, transfused with frozen fresh plasma with monitoring the Hemodynamic and respiratory status and close monitoring of blood glucose level. Having not restarted the diuresis under diuretic the decision of putting dialysis is taken on day 4 of his hospitalization.

The patient was dialyzed 3 days in a row following which he has had a recovery of diuresis without normalization of the renal function.

### III. Discussion

#### Botanical description:

The Thistle (Addad), an endemic northern African thistle, is an herbaceous, perennial, thorny plant with a large root. The leaves form a rosette close to the ground. The flowers are pink, purple purple or pinkish, confusing with Spanish thistle and wild artichoke



*Atractylis gummifera* (19)

**Known use:**

The plant is present mainly in the rural areas.

Several erroneous therapeutic uses have been reported to stop haemorrhage, facilitate childbirth (by inhalation of the thistle smoke), also used as a narcotic. External use appears to be in the treatment of scabies, acne and boils (3, 1, 4).

**Toxic Effects:**

The glu thistle is incriminated in several cases of severe poisoning; often accidental (confusion with wild artichoke) but it can be volunteers in attempts of autolysis (5, 6). The poison control center in Morocco reported 344 between 1992 and 2008, whose age is less than 20 years old in 82.5% of the cases (7, 8), which is undoubtedly underestimated for undiagnosed or not reported cases to the Pharmacovigilance Center.

The plant is toxic in its totality, but essentially the root as its potassium atractylate content, and gummiferin (carboxyatractiloside) (8, 9). These substances inhibit oxidative phosphorylation by inhibiting the formation of ATP from ADP. Atractiloside causes hepatocyte apoptosis by increasing the permeability of the mitochondrial membrane by the creation of pores transport, and this is due to the release of cytochrome C. whereas carboxyatractiloside inhibits the transformation of ADP into ATP (8, 10).

The clinical table is characterized by its diversity making the diagnosis difficult if the notion of taking this plant is not reported. The diagnosis is based on the interrogation of the entourage and the patient and sometimes the presence of toxins in the gastric liquid or in the urine (11, 12)

The Atractyloside research is carried out by chromatography on thin layer of silica gel (13).

In general, two forms of intoxication can be distinguished according to the severity of the damage, a benign form made up of digestive signs, good prognosis and recovery without sequelae and a serious form, as its the case of our patient, characterized by Neurovegetative, hepatic or renal involvement (5)

After the plant ingestion, there is a phase of latency, variable from 6 to 36h which could delay the support, and even monitoring in the absence of signs of severity then proves necessary.

In addition to the general signs (headache, dizziness ...), digestive signs, present in 80% of the cases, are made of predominantly epigastric abdominal pain associated with vomiting (yellowish-green, blackish), or even haemorrhagic), diarrhea with blackish and fetid stools (7).

The status phase is manifested by the appearance of hepatic involvement with the most frequent jaundice associating hepatocytic necrosis and micro vesicular steatosis (14, 15). Neurological disorders, hypothermia, cardiovascular disorders such as tachycardia, rhythm disorders and blood pressure irregularity are encountered in 30% of cases. Respiratory disorders can also be seen in 29% of cases (7). Renal involvement is seen in 2% of all reports (7), varying gravity from mild renal insufficiency, renal impairment with anuria, hematuria may also be seen (13). The damage is usually acute tubular necrosis (16) or secondary to rhabdomyolysis (12).

**Treatment:**

Treatment is mainly based on symptomatic support, antidote therapy does not exist to date, but given the frequent hepatic impairment, administration of N Acetyl Cysteine would improve the Table. Some authors report the benefit of taking activated charcoal which may reduce intestinal absorption at the initial phase (17). While in vitro studies have tried to evaluate the efficacy of a solution containing glucose, dinitrophenol, ATP and cytochrome C, this treatment has corrected the blood glucose and the hypotension while administered has an early delay (18).

Gastric lavage is effective within 60 minutes after the ingestion. Induced vomiting is contraindicated

Continuous blood glucose monitoring and perfusion of glucose serum is necessary in view of the hypoglycaemia risk. Sometimes the correction of hydrolysis and acidosis is not sufficient and dialysis is used. The fight against pulmonary congestion and the contribution of Coagulation factor is sometimes necessary.

#### IV. Conclusion

Intoxication by the glue thistle remains severe despite early support, hepatic damage and neurovegetative affects its prognosis, while the renal damage remains less frequent and poorly documented further studies must be conducted in order to Determine the mechanisms.

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