Case study

Acute Kidney Injury Due To Wild Mushroom Consumption: Hemodialysis And Ozonotherapy Combination A Therapeutic Asset (About One Case)

Abstract

Objective: to assess the value of ozone therapy in the management of acute toxic kidney injury due to the ingestion of wild mushrooms.

Even if severe intoxications by ingestion of wild mushrooms are rare, they can be fatal following the attacks of several organs with very serious complications. One of the complications is acute toxic kidney injury requiring emergency hemodialysis sessions. Extra renal purification can be effective if it is well conducted and associated with other treatments. This is the case of a multidisciplinary management of acute toxic renal failure by ingestion of wild mushroom whose management was done with hemodialysis associated with ozone therapy whose results were more interesting.

Key words : acute kidney injury, wild mushrooms, Benin

Introduction

The consumption of mushrooms is not rare. About 50 to 100 mushrooms are toxic to humans [1]. Poisoning by ingestion of mushrooms is not rare. Most situations are benign [1]. If these intoxications are often benign, severe intoxications are to be deplored [2]. The attacks can concern several organs and/or systems such as the liver, kidneys, heart, nervous system, skin. The onset canbe brutal or progressive [2,3]. Acute renal failure can occur with high mortality, especially in the presence of other complications, requiring extra renal purification sessions. Other treatments, such as ozone therapy, could be combined with dialysis to better treat patients. Among complementary medical approaches, ozone therapy is known all over the world but it is not yet practiced correctly everywhere because of the incomplete knowledge by improvised ozone therapists [4]. We report a case of acute renal failure due to wild mushroom consumption in which hemodialysis and ozone therapy were combined for better management at the Departmental Teaching Hospital of Borgou (Benin).

Presentation of Case

The patient was a 30-year-old male farmer living in a rural area more than 100 km from a referral hospital. The onset of symptoms was three days before his admission, marked by abdominal pain, diarrhea and vomiting, followed by anuria, dyspnea, jaundice following

ingestion of wild mushrooms, which prompted a consultation at the neares thospital where investigations revealed renalfailure, liver insufficiency, hepatic cytolysis syndrome and cholestasis. Thus, the patient was referred to the nephrology department of the Departmental University Hospital of Borgou, Benin, for better management.

On admission to the department, the patient was found to be in general condition, WHO stage III, severely dehydrated, with a blood pressure of 105/68 mmHg, icteric and dry mucous membranes, and a respiratory rate of 36 cycles per minute with an oxygen saturation of 82% in ambient air. The urine dipstick showed pH 5, specific gravity 1.030, uribinogen +.

The paraclinical examination of this day found: blood glucose 1.12 g/l, blood urea 3.40 g/l, creatinine 118.0 mg/l, natraemia 130.0 meq/l, kalaemia 3.4 meq/l, chloraemia 90.7, meq/l, total bilirubinemia 16.1 mg/l, conjugated bilirubinemia 12.5 mg/l, uricemia 74.1 mg/l, aspartate aminotransaminase 74 IU/l, alanine aminotransferase 224IU/l. Hemoglobin level 9.9g/dl microcytic and hypochromic and thrombocytopenia 59000/l.

The patient was put on treatment, oxygentherapy at 6 liters per minute, hydration with saline 9‰ at a rate of 3 liters per day, sodium bicarbonated 14‰ 500 ml per day, Ringer Lactate 500 ml per day, transfusion of two bag of blood, bethametasone 4mg twice a day and vitamin therapy with vitamin C and vitamin B complex.

48 hours later, there was an alteration of consciousness with a Glasgow score of 11 and encephalopathy. The paraclinical blood tests showed : blood glucose 1.36 g/l, blood urea 4.41 g/l, creatinine 125.7 mg/l, natraemia 115.0 meq/l, kalaemia 5.5 meq/l, chloraemia 80, meq/l, calcaemia 43.0 mg/l, phosphaemia 161.1 mg/l, magnaemia 31.0 mg/l, total bilirubinemia 56.1 mg/l, conjugated bilirubinemia 43,7 mg/l, aspartate-aminotransaminase 121 UI/l, alanine-aminotransferase 432 UI/l, prothrombin level 23.1% and INR 2.8, total cholesterol 1.38 g/l, HDL-cholesterol 0.33g/l, triglyceridemia 5.12 g/l, uricemia 141.1 mg/l.

In view of these results, the patient was put under hemodialysis on three successive progressive doses with an adequate filling and also a session of oxygen-ozonotherapy at the end of each dialysis session and two complementary sessions of great auto-haemo-transfusion of ozone at the rate of one session per day. The Great Oxygen-Ozone Auto-Hemotherapy consists in reinjecting into the blood stream blood taken from the patient (about 200 ml) in a sterile bag containing an anticoagulant and mixed with the oxygen-ozone added to the vacuum container.

At the end of the three sessions of hemodialysis coupled with oxygen-ozone therapy, a progressive improvement of the state of consciousness and a progressive disappearance of dyspnea, asthenia and regression of jaundice were noted. The paraclinical examinations at the

end of the two complementary sessions of great auto-haemo-transfusion found : blood glucose 1.10 g/l, blood urea 0.65 g/l, creatinine 25.6 mg/l, natraemia 137.0 meq/l, kalaemia 4.6 meq/l, chloraemia 100.3 meq/l, calcaemia 83.2 mg/l, phosphaemia 43.1 mg/l, magnesaemia 17.0 mg/l total bilirubinemia 12.2 mg/l, conjugated bilirubinemia 5.5 mg/l, uricemia 41.7 mg/l, aspartate transaminase 29 IU/l, alanine transaminase 45 IU/l, hemoglobin level 12g/dl, platelets 174000/l

The continuation of the treatment was done without the hemodialysis sessions but with the great auto-hemo-transfusion sessions at the rate of two sessions per week and over two weeks.

Discussion

Wild mushrooms are highly toxic and responsible for the majority of fatal poisonings. Ingestion of wild mushrooms leads to irreparable destruction of the liver and other organs such as the kidneys [3]. Moreover, the toxicityis not reduced by cooking, freezing or drying [5]. No definitive antidote has yet been found, but some specific treatments appear to increase survival. Other methods to increase toxin removal have been tested: hemodialysis, hemoperfusion, plasmapheresis, and peritoneal dialysis and have occasionally shown efficacy but, overall, do not appear to significantly improve outcomes [6-10].

The combination of ozone therapy may reduce toxicity for several reasons that remain to be better documented. It is reported to activate the immune system, improve oxygen utilization, and stimulate the release of growth factors and other mediators that may reactivate the immune system [11,12]. In response to ozone concentration, the release of platelet-derived growth factor (PDGF)-AB, transforming growth factor (TGF) b-1 and IL-8 has been measured[12]. Ozone finally acts as a useful messenger through three processess chematically indicated as: detoxification, dilution, and excretion [13]. Therefore, the normalization of the antioxidant-redox cycle and the detoxification system slowly promotes tissue regeneration [13]. As recently established ozonetherapy is able to specifically treat oxidative stress-related diseases. The improvement also depends on the age of the patients and the presence of comorbidities that may delay healing. This is not surprising because even for oxygen, as well as glucose and uric acid levels, a change in physiological concentrations is not good [14]. Based on the mechanisms of action, ozone therapy appears to be a safe, economical and effective treatment for patients with cardiovascular disorders, based on the following biological responses [14]. Ozone therapy improves blood flow and oxygen delivery to ischemic tissues as well as general metabolism; it upregulates antioxidant enzymes, induces a

slight activation of the immune system and enhances the release of growth factors and has an excellent disinfectant activity [15].

Conclusion

Wild mushroom ingestion has serious and fatal consequences. The management is multidisciplinary and sometimes requires extra renal purification sessions. But the association of ozone therapy makes symptomatic treatments more effective.

Consent for Publication

All authors declare that informed consent was obtained from patient for publication of this study.

Ethics Approval and Consent to Participate

" All authors hereby declare that all ozone therapy had been examined and approved by the board of ethics committee of Faculty of Medicine, University of Parakou in accordance with the ethical standards laid down in 1964 Declaration of Helsinki"

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