

Acute Renal Failure as a Result of Mushroom Poisoning

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Abstract

Mushroom poisonings may present with early findings in the first 2 hours and late findings between 6 hours and 20 days. In this article, it was aimed to emphasize that mushroom poisoning should be considered in the differential diagnosis of renal failure and coma, as in the patient whose history was learned to have eaten mushrooms 10 days ago.

Keywords: Acute Renal Failure, Mushroom Poisoning, Hemodialysis

Introduction

Mushroom poisonings may present with early findings in the first 2 hours and late findings between 6 hours and 20 days. Renal failure can be seen in the acute period in fungi containing orellin and allenic norleucine, and within 2-6 days in species containing cyclopeptide¹. Patients apply with complaints of nausea, vomiting, diarrhea, unconsciousness in the first 3 days after ingestion of mushrooms containing nephrotoxin, and oliguria and anuria within 3-20 days. Patients may need dialysis in addition to supportive treatment².

Case

Twenty-nine-year-old male patient was brought to the emergency room due to deterioration in his general condition and unconsciousness. In the patient's history, there were nausea and vomiting after eating mushrooms about 10 days ago, and antibiotic initiation in an external center. The mushroom was eaten 10 days ago and no treatment other

than antibiotics was given. On physical examination, the general condition was poor, unconscious, and Glasgow coma scale was 7. The patient who had sudden cardiac arrest in the emergency department was admitted to the intensive care unit after resuscitation. The patient's blood pressure was 130/90 mmHg, pulse: 112/min, fever: 36.5 C, respiration: 36/min. Other physical examination revealed no abnormality. In the laboratory tests of the patient: Hemoglobin 12.5 g/dL(12,2 -18,1), platelet $34610^3/\mu\text{L}$ (142 - 424), glucose 89 mg/dL(74 - 109), Urea 189 mg/dl(17 -43), Creatinine 14 mg/dL(0,5 - 1,2), sodium 127mmol/L(136 - 146), potassium 7.5 mmol/L(3,5 - 5.1), Aspartat Aminotransferaz 47 U/L(0 - 40), alanin Aminotransferaz 13 U/L(0 - 41), Calcium 8.3 mg/dL(8,6 - 10,2), Troponin I 2.39ng/ml, amylase 146U/L, kreatin kinaz 1279IU/L., kreatin kinaz -MB 121I U/L., Gama glutamil transferaz 11 U/L(12 -64), Lipase 35U/L and metabolic acidosis(pH=7.20) was detected in blood gas. The patient was taken to emergency hemodialysis. Hemodialysis was applied for 3 days. Control blood values normal. On the 7th day, the patient was extubated. On the 10th day, the patient recovered completely and was discharged voluntarily.

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Received: 08.03.2024 • **Revision:** 04.07.2024 • **Accepted:** 01.08.2024

Cite this article as: Karakuş A, Polat M. Acute Renal Failure as a result of Mushroom Poisoning. Eurasian J Tox. 2024;6(2): 38-39

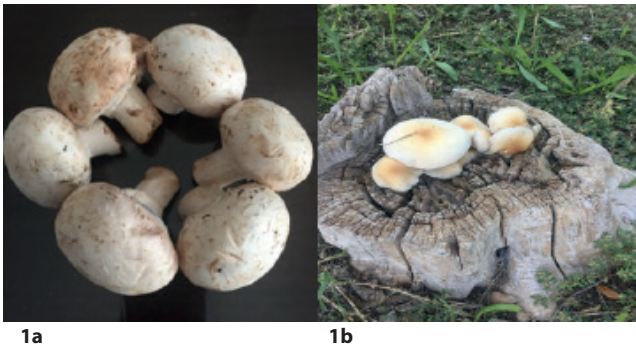


Photo 1a: Cultivated mushrooms (Taken from the archive of Prof. Dr. Ali Karakuş)

1b. Natural mushrooms (Taken from the archive of Prof. Dr. Ali Karakuş)

Discussion

Mushroom poisonings constitute 1.5-3.4% of all poisonings¹. Mortality from mushroom poisoning is high, especially in spring and autumn, and is often caused by amanita species. Amatoxin, which is mainly responsible for poisonings; It affects cells with rapid cell turnover, such as the liver, kidney and intestinal system. Although toxins affect the whole body, liver and kidney failure in particular are the main causes of mortality and morbidity in these patients. The average half-life of alpha-amanitin is 22 hours, 85% of which is excreted in the urine within six hours. Acute tubular necrosis (ATN) may occur as a result of the absorption of toxins from the proximal tubule². In our case, the fungal species was not specified. However, the history and clinical findings developed after mushroom ingestion and acute renal failure was observed.

While fungi can cause mild symptoms such as nausea and vomiting, they can also cause serious symptoms such as kidney and liver failure. The duration of signs and symptoms varies depending on the type of toxin contained in the mushroom. Mushroom poisonings are classified into two groups: ‘those with early symptoms (first 6 hours)’ and ‘those with late symptoms (later than 6 hours)’. The Amanita group causes acute gastroenteritis syndrome within a few hours and delayed-onset renal failure within a week. Three to six days after mushroom consumption, patients begin to experience symptoms of renal failure, particularly oliguria and anuria. Alpha-amanitin and beta-amanitin, the most poisonous amatoxins, are held responsible for hepatorenal syndrome³. Our case was a case with late symptoms and signs of acute renal failure.

The most serious mushroom poisonings occur with hepatotoxic species, the nephrotoxic ones being Cortinarius orrelanus and Paxillus involutus⁴⁻⁶. In order to minimize toxic damage to highly sensitive cells, detoxification treatment should be started early⁷.

Dialysis is often necessary in case of ingestion of Amanita group mushrooms to restore kidney function. Supportive dialysis is typically required for two to five weeks, but in one case was required for six months. If large amounts of fluid cannot be removed with such conservative

methods, ultrafiltration or dialysis treatment may be required⁸. Dialysis does not accelerate the recovery of acute renal failure. Initial studies did not provide data indicating that early dialysis improved prognosis⁹.

It was stated that in Amanita proxima poisoning, which included fifty-three cases, acute renal failure developed in 14 of the patients and hemodialysis was successfully performed in 10 of them. However, the hemodialysis procedure performed here is not for the removal of the toxin, but for the treatment of acute renal failure¹⁰. Since the patient had acidosis, an emergency hemodialysis catheter was installed and he was hemodialyzed. After 1500 uf was made. Medical treatment has started. Our case was discharged with full recovery after follow-up and treatment.

Conclusion

As a result of mushroom poisoning, late clinical kidney failure can be seen. Mushroom poisoning should not be forgotten in patients brought to the emergency room with coma. If it is not possible to follow-up these patients after the complaints that occur in the first days, they should be informed about possible late complications. Cultivated mushrooms should be preferred to prevent poisoning.

References

1. Kalkan Ş, Tunçok Y, Güven H. Cases reported to the Drug and Poison Information Center. Dokuz Eylül University Faculty of Medicine Journal 1998;12:275-83.
2. Taban S, Dursun B. Severe acute renal, hepatic and cardiac failure in the setting of rhabdomyolysis due to mushroom poisoning Cukurova Med J 2019;44:1515-9.
3. Logarenger A, Tuchweber B, Gicquaud C: Toxicity of peptides of Amanita virosa mushrooms in mice. Fundam appl Toxicol 1985; 5: 1144-52.
4. Kohn R, Motovska Z: mushroom poisoning, classification, symptoms and therapy. Vnitr Lek 1997; 43: 230-3.
5. Tunçok Y, Kalyoncu NI. Mushroom Poisoning. T.R. Ministry of Health Poisoning Diagnosis and Treatment Guidelines for Primary Care: 137-42. Ankara, Republic of Turkey Ministry of Health Refik Saydam Hygiene Center Directorate of Hygiene School. 2007.
6. Eren SH. Mushroom poisoning: retrospective analysis of 294 cases. Clinics (Sao Paulo) 2010;65:491
7. Evrenkaya TR, Atasoyu E. Extracorporeal techniques in the treatment of mushroom poisoning Turkish Journal of Nephrology Dialysis and Transplantation I Official Journal of the Turkish Society of Nephrology 2001;10(1):14-18.
8. Horoz M, Özgür Ö. Acute Renal Failure. Harran Medical Faculty Der 2004;1:48-63.
9. Fischer RP, Griffen WO Jr, Reiser M, Clark DS. Early dialysis in the treatment of acute renal failure. Surg Gynecol Obstet 1966;123:1019-23.
10. de Haro L, Jouglard J, Arditti J, David JM: Acute renal insufficiency caused by Amanita proxima poisoning: experience of the poison Center of Marbeille. Nephrology 1998; 19:21-4.