

## Case Report

## Severe Renal Failure Following Ophidian Envenomation in Niger

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**Abstract: Introduction:** Data on kidney lesions during ophidian envenomation in Niger are rare. The aim of the study was to describe a case of severe renal failure secondary to ophidian envenomation occurring in our hemodialysis nephrology department. **Observation:** This is a 53-year-old patient, resident in a rural town near the city of Niamey. She was referred to us from the National Hospital's Internal Medicine Department for severe renal impairment secondary to a snakebite. Clinical examination showed poor general condition, impaired consciousness with a Glasgow 10/15, severe uremic syndrome, hemorrhagic syndrome and metabolic dyspnea. On biology, severe anemia was noted at 5.3 g/dl, thrombocytopenia at 32,000 elements/ $\mu$ l, white blood cells at 18,109/L, urea level at 50 mmol/l and serum creatinine at 1009  $\mu$ mol/l i.e. an eGFR= 4 ml/min. Despite the initiation of hemodialysis and transfusions, the patient died in a picture of septic and hemorrhagic shock. **Conclusion:** ARF secondary to ophidian envenomation is accompanied by a considerable risk of mortality, especially in the event of delay in treatment.

**Keywords:** Kidney failure; Ophidian envenomation; Niger.

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## INTRODUCTION

Snakebites are a neglected public health problem in many countries in the tropics and subtropics. There is significant mortality and morbidity, particularly in sub-Saharan Africa, Asia and Latin America [1].

In Niger, there are few data on ophidian envenomations [2]. An old epidemiological study dating from 2002 on ophidian envenomations conducted in the Niamey region found an annual morbidity of about ten envenomations per 100,000 inhabitants and a hospital lethality of between 5 and 7% [3].

In Niger, there is a delay in care linked to the difficulty of access to health establishments, and sometimes to cultural beliefs. Indeed, rural populations often use devices such as tourniquets, traditional plants, escharification, suction cups, etc. in an attempt to reduce the effects of the venom. Most of these interventions are ineffective and, in some cases, deleterious. Polyvalent anti-venom is only available in private pharmacies in Niamey.

Kidney injury is a known but infrequent complication of ophidian envenomation, but can lead to acute kidney failure requiring dialysis in some cases [4]. We have very few studies on renal lesions during ophidian envenomation, hence the purpose of this case description.

## OBSERVATION

This is a 53-year-old patient, with no notable medical-surgical history, a housewife in N'dounga (rural commune Kollo about fifty kilometers from Niamey). She was referred to our center for severe renal impairment secondary to a snakebite. Indeed, in the history of the disease, we find a nocturnal snake bite (viper type) on the foot that occurred in full sleep. The patient had consulted at the National Hospital of Niamey a week after the accident where she had been hospitalized and received treatment, in particular an antivenom serum. Faced with the worsening of her general condition and the severe deterioration of her renal function, she was referred to our department. The clinical examination on admission found a patient in poor general condition, altered consciousness with a Glasgow 10/15, severe uremic syndrome, hemorrhagic syndrome made up of epistaxis and metabolic dyspnoea. Biology showed severe anemia at 5.3 g/dl,

hyperleukocytosis at 18,109/L, and severe thrombocytopenia at 32,109/L. renal function was severely impaired with a urea level at 50 mmol/l and serum creatinine at 1009  $\mu$ mol/l. PT and INR were normal. CPKs and D-Dimers were not performed.

Therapeutically, she had benefited from several whole blood transfusions coupled with hemodialysis sessions (three in total), dual antibiotic therapy including a third-generation cephalosporin.

The evolution was marked by the persistence of the hemorrhagic syndrome and the occurrence of shock, sepsis and the death of the patient.

## DISCUSSION

Ophidian envenomations remain a real public health problem in the tropical regions of the world and particularly in Africa. They are responsible for a significant mortality rate and sequelae [1]. In Niger, the majority of bites occur during the rainy season, the victims are predominantly male and the average age of patients is 29 years. They are mostly farmers bitten during the work of the fields. On the other hand, lethality is high at 15%, due to the very low use of modern health centers and their under-equipment [2]. Antivenom serum is concentrated in the city, in Niamey in particular, and unavailable in peripheral health facilities [3].

Acute renal failure is a severe complication of ophidian envenomation, which can lead to dialysis in some cases [4], its incidence is estimated between 5 and 42% according to Indian and Sri Lankan studies [5, 6, 8]. There is no consensus regarding a single mechanism to explain ARF pathology in envenomation. The mechanism is complex, combining renal ischemia, direct nephrotoxic action, formation of microclots in the renal vasculature and deposition of myoglobin and hemoglobin in the renal tubules [7]. The higher the stage of the AKI, the greater the probability of mortality. Patient mortality can reach 21.5% in cases of ARI [8]. A third of patients with ARI will develop long-term complications such as chronic kidney disease, hypertension during the follow-up period [8]. Advanced age and severe renal impairment are established risk factors for CKD progression [9].

## CONCLUSION

ARF secondary to ophidian envenomation is accompanied by a considerable risk of mortality. The

combination of severe kidney damage, shock and a coagulation disorder is a factor of poor prognosis.

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