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Case Report

Venomous Animal Exposure and Renal Risk in Remote Paraguay: A Spider-Bite Case Contextualised by Four Previously Reported Severe Cases

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Abstract

We report a 58-year-old man from Horqueta, northern Paraguay, who works periodically on cattle ranches in the remote Paraguayan Chaco and presented with a bite from a locally named 'ñandupé' spider (reportedly Selenops sp.) followed by limb oedema. He had pre-existing chronic kidney disease and microscopic haematuria: serum creatinine was 2.24 mg/dL before the bite and 1.65 mg/dL at later follow-up, with no oliguria, hyperkalaemia, acidosis or acute creatinine rise. We contrast this case with four previously published severe renal cases from the same regional centre — probable Loxosceles bite, multiple wasp stings, Bothrops snakebite and decompensated chronic kidney disease — all of which required haemodialysis and two of which were fatal. Together, these cases show that venomous animal exposure in rural workers warrants early renal surveillance, but temporal association alone should not be equated with nephrotoxicity, particularly when chronic kidney disease coexists.

Keywords: Acute kidney injury; Chronic kidney disease; Haemodialysis; Paraguay; Rural health; Spider bite

Introduction

Venomous animal injury is both a toxicological and a rural-health problem. In Paraguay, 1651 snakebite envenoming cases were notified between 2015 and 2021; men accounted for 68% of cases, and 47% of patients with occupational information were working in agricultural or livestock settings. Alto Paraguay, in the Chaco, had the highest cumulative rate reported nationally, and Concepción also contributed substantial case numbers [1]. Earlier Paraguayan work similarly described a concentration of clinically important ophidism among men in agricultural regions bordering Brazil [2].

Kidney complications can determine prognosis after envenomation. A 2026 systematic review estimated acute kidney injury (AKI) in approximately 23% of snakebite patients, with renal replacement therapy required in about 28% of those who developed AKI [3]. Multiple wasp stings can cause AKI through direct venom toxicity, haemolysis and rhabdomyolysis [4], and systemic loxoscelism can also involve the kidney, although less frequently than its characteristic local manifestations [5]. The rural pathway to severe disease is not explained by venom alone: staged care and limited local resources can shape outcomes after severe envenomation [6,7].

Our group previously published four severe venom-related renal cases from the Hospital Regional de Concepción [8]; those patients are not republished here. We report a previously unpublished fifth patient whose occupational exposure occurred in a remote cattle-ranch environment but whose renal course did not support venom-induced AKI, and use this contrast to examine how rural exposure should be documented and how causal over-attribution can be avoided when chronic kidney disease is already present.

Case Report

A 58-year-old man living in Horqueta, northern Paraguay, was under nephrology follow-up for chronic kidney disease. His work periodically required travel to cattle ranches in remote areas of the Chaco; this residence–workplace distinction was clinically relevant, since his home district did not describe the environmental setting of exposure.

At follow-up, he reported that approximately 10 days earlier he had been bitten by a spider locally called 'ñandupé', reportedly Selenops sp.; the specimen was unavailable for taxonomic confirmation. He described oedema of the affected lower limb. An ulcerated lesion was later seen in the area, which he attributed

to a separate traumatic event rather than the bite; the ulcer is therefore not classified as venom-induced necrosis.

Renal impairment clearly pre-dated the exposure. On 30 January 2026, haemoglobin was 13.5 g/dL, urea 53 mg/dL and creatinine 2.24 mg/dL, with microscopic haematuria (8–10 red blood cells per high-power field). On 23 August 2026, haemoglobin was 11 g/dL, urea 50 mg/dL and creatinine 1.65 mg/dL, with persistent haematuria (6–8 red blood cells per high-power field). Using the 2021 CKD-EPI equation, these values correspond to an estimated glomerular filtration rate of approximately 33 and 48 mL/min/1.73 m², respectively.

There was no documented oliguria or anuria, severe hyperkalaemia, major metabolic acidosis, or acute creatinine rise temporally linked to the bite; renal replacement therapy was not indicated. The later creatinine was lower than the previously documented value, making clinically significant venom-induced AKI unlikely. Evidence on human Selenops bites is sparse, limited to an older case report, and insufficient to infer a characteristic nephrotoxic syndrome from the local name alone [9]. At later review, the patient also described a longstanding foot wound from a mechanical injury approximately 12 years earlier, with intermittent oedema and purulent secretion when irritated by footwear; this chronic wound was a separate problem, unrelated to the reported spider exposure.

For contextual comparison, Table 1 summarises this case alongside four previously published regional cases [8]: three patients without advanced chronic kidney disease who developed dialysis-requiring AKI after probable Loxosceles bite, multiple wasp stings or Bothrops snakebite, and a fourth patient with advanced chronic kidney disease who developed severe uraemic and metabolic decompensation during a probable spider-associated soft-tissue infection. The two fatal AKI presentations occurred after delays of approximately 15 and 18 days before definitive regional care. The first four rows of Table 1 are not new data.

Discussion

This case illustrates why rural exposure history and renal causality should be considered separately. Mobile rural work can be invisible if only residence is recorded: the patient lived in Horqueta but periodically worked on remote Chaco ranches, and national data confirm that agricultural and livestock occupations are central to snakebite risk in Paraguay [1]. Clinical history-taking and rural surveillance should therefore record the place and activity at the time of exposure, not only the municipality of residence.

Exposure does not equal renal causality. Chronic kidney disease and microscopic haematuria were present before the bite, and renal function subsequently improved rather than deteriorated; a plausible environmental exposure can coexist with chronic renal abnormalities without causing AKI. This distinction is particularly important when species identification depends on a local name or patient recollection rather than specimen confirmation.

By contrast, the previously published regional cases show that delayed definitive assessment can coincide with severe renal presentation: the two fatal cases followed approximately 15 and 18 days of delay before definitive care [8], consistent with reports emphasising coordinated multilevel care and timely transfer after snakebite [6]. These observations cannot prove that earlier treatment would have prevented death, but they support the principle that timely recognition, transfer and serial biochemical assessment matter in rural settings.

Regional dialysis capacity is part of emergency rural care: four of the previously published cases required repeated haemodialysis [8], within a service that already manages substantial acute and chronic illness. A previous study at the same centre reported 18 deaths among 101 haemodialysis patients over six months, with sepsis accounting for 77.8% of deaths and severe acute renal failure contributing importantly to mortality [10]. Emergency dialysis capacity should therefore be considered part of regional preparedness for severe envenomation, not a separate tertiary concern.

Preserved urine output is not sufficient reassurance, since severe renal dysfunction requiring haemodialysis occurred in

Table 1: Current case compared with four previously published regional cases [8].

Case / exposure	Rural or access feature	Renal phenotype	Haemodialysis	Outcome
Published case 1: probable Loxosceles bite	~15-day delayed presentation; prior care elsewhere	Severe AKI with preserved diuresis; necrotising soft-tissue infection and septic shock	10 sessions	Renal biochemical improvement; death after transfer
Published case 2: multiple wasp stings	~18-day delayed definitive presentation	Anuric AKI, severe hyperkalaemia and metabolic acidosis	9 sessions	Death
Published case 3: Bothrops snakebite	Presented 3 days after bite	Severe AKI with thrombocytopenia	12 sessions	Partial renal recovery; discharge
Published case 4: probable spider-associated soft-tissue infection	Resident of a northern Paraguayan district; regional referral care	Severe decompensation of pre-existing stage 5 CKD	At least 12 sessions	Progression towards maintenance dialysis
Current case: probable 'ñandupé' (Selenops sp. reported)	Lives in Horqueta; works on remote cattle ranches in the Chaco	Pre-existing stage 3 CKD; no demonstrable AKI	None	Later creatinine lower than pre-exposure value

AKI, acute kidney injury; CKD, chronic kidney disease. The first four rows summarise previously published data [8] and are shown only for contextual comparison.

previously reported patients who retained substantial diuresis [8]. When clinically significant envenomation is suspected, creatinine, urea, potassium and acid-base status should be checked early and repeated according to severity, even where laboratory capacity is limited. A pragmatic rural pathway should document the animal and certainty of identification, record the occupational and geographic exposure setting, establish time from exposure to care, screen for pre-existing kidney disease, obtain early renal and metabolic testing, and define transfer routes to centres with haemodialysis, preserving terms such as 'probable' or 'reported' when identification is uncertain.

Conclusion

This case shows why rural exposure history and renal causality should be separated conceptually. A worker may have genuine environmental exposure in a remote setting yet no venom-related kidney injury, while previously published patients from the same region developed catastrophic AKI or decompensated chronic kidney disease after venomous animal encounters. For rural and remote services, the priority is not to assume nephrotoxicity but to detect it early when it occurs, recognise limited renal reserve, and ensure timely access to regional haemodialysis.

Declarations

Ethics approval and consent to participate: The project was approved by the Research Ethics Committee of the National University of Concepción Faculty of Medicine, in accordance with minutes number 11, folio 31.

Consent for publication: The data were obtained from the medical record.

Competing interests: The authors declare no conflicts of interest.

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Prior publication: Four comparator cases were previously published in Jana Nexus: Journal of Health and Medicine [8]. They are cited and summarised only as published regional context. The current case has not been published previously.

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