

Teaching Point
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Severe acute renal failure in two hand-drummers after the same rhythmic session

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Introduction

We describe two cases of acute renal failure (ARF) (Caucasian man and one of African origin) occurring after the same prolonged rhythmic session with hand-played drums.

The possible mechanisms of renal failure and the clinical consequences are discussed here.

Case 1

A 35-year-old Caucasian man, with a personal history negative for renal diseases, arrived at the first aid department with severe ARF; 4 days earlier, he had continuously played for ~6–8 h in a summer music festival as a hand-drummer of the bongo-djembe maintaining poor hydration and having a modest cannabis consumption.

After drumming, he showed rust urine emission, transient fever (38.5°C), lumbar pain and vomiting, and following his general practitioner's prescription, he started a non-steroidal anti-inflammatory drug (NSAID) (Nimesulid 200 mg) with no benefits.

After 2 more days, oliguria occurred and the patient was admitted to the emergency department.

At presentation, clinical examination was unremarkable while investigations revealed creatinine 858 µmol/L, urea 50.7 mmol/L, haemoglobin 7.27 mmol/L, white cell count 9000/mm³, platelets count 170 000/mm³; urinalysis positive for haemoglobin without the presence of erythrocytes in the sediment, microalbuminuria 247 mcg/mg creat; transaminases, creatine phosphokinase, complementaemia, immunoglobulin dosing, serology for vasculitis and connectivitis, viral markers, Widal–Wright's reaction and anti-streptolysin-O titres were all unremarkable. Haptoglobin was 201 mg/dL (normal range 30–200 mg/dL), and blood

samples were negative for the presence of toxic substances (cannabinoids, opioids, cocaine, amphetamine).

Ultrasonography revealed a slight enlargement of both kidneys (13.1 cm on the left and 13.4 cm on the right).

After hydration and furosemide, the patient completely recovered renal function during the following weeks. No renal biopsy was performed.

Two months later, serology confirmed the normalization of creatinine (83.9 µmol/L), microalbuminuria and urinalysis.

Case 2

A 38-year-old African man, with no cardiovascular or renal disease and a medical history with repeated emission of rust urine after intense drumming on a bongo-djembe, was admitted to the emergency department with nausea, flank pain and rust urine emission.

Two days before, the patient had played in a prolonged hand-drumming session (the same musical event previously described) maintaining poor hydration with a karkade-based infusion imported from Senegal.

At presentation, the blood chemistries were notable for creatinine 1043 µmol/L, urea 65 mmol/L with no abnormalities in the dipstick urine specimen, haemoglobin 8.5 mmol/L, platelet count 157 000/mm³, leucocytes 4920/mm³, uric acid 0.59 mmol/L, calcium 2.1 mmol/L, phosphorus 2 mmol/L and cholesterolaemia 5.43 mmol/L.

Further investigations revealed 24-h proteinuria of 0.3 g and hepatitis serology positive for HBV infection with no anti-HBs antibodies.

Serology for rhabdomyolysis, vasculitis and connectivitis, complementaemia and immunoglobulin dosing were all in the normal range.

Blood samples were negative for the presence of substances derived from drug consumption, and biochemical analysis in the karkade beverage did not reveal any nephrotoxic contaminants/herbs. Renal ultrasound and chest X-ray were unremarkable.

The patient first underwent renal replacement therapy with haemodialysis in an emergency setting and was subsequently rehydrated.

As a result, a polyuria phase lasting 2–3 days preceded a rapid renal function improvement, and control chemistries performed 1 month later confirmed the complete normalization of serum creatinine (88 $\mu\text{mol/L}$).

Discussion

The two cases of severe ARF reported here (which must be added to the other six cases already described in the literature) developed in young men with different ethnicities after the same rhythmic session with bongo-djembe (Western African hand-drum).

Both patients showed an initial episode of brown urine (rust urine) emission accompanied by an important renal failure to the extent that in one case haemodialysis was necessary.

In the literature, there is extensive documentation on haemoglobinuria and macrohaematuria induced by physical activity, and there are reports of haemoglobinuria (or 'pigmenturia') derived from the use of manual percussions dating back to the early 1970s [1–3] but only one of these works showed an episode of renal failure without oliguria [2].

These episodes are currently increasing, and since 2005 at least six cases of severe (albeit transient) ARF, two of which have required the use of renal replacement therapy [4–6], have been described. In a recent study, Tobal *et al.* [7] evaluated the onset of urinary abnormalities and/or renal function alterations in a population of 45 percussionists during the Montevideo Carnival.

By the end of the event, about 64% of the subjects studied had urinary abnormalities (microhaematuria, rust urine or proteinuria), and a significant proportion had a transient worsening of renal function often closely associated with rust urine; there were no reports of severe renal insufficiency.

From our conversations with habitual percussion players it emerged that rust urine emission after a rhythmic session is a common phenomenon, but as usually isolated and spontaneously remitting, it does not induce the affected players to further clinical investigations.

Indeed, the manual repeated trauma can determine an intense intravascular haemolysis [4,7] and a renal damage from haemoglobin's intrinsic toxicity for the proximal tubule cells.

Although haptoglobin was found to be in the normal range in our patients, its determination occurred only days after the patients' admission to hospital and then at some distance from the acute kidney damage.

In our patients, other possible clinical risk factors (dehydration, the use of NSAIDs and opioids) probably contributed to the severity of ARF that is not always present in the other cases reported.

As some authors have suggested [7], we believe that the introduction of appropriate behavioural standards must be observed prior to any rhythmic session, such as abundant hydration, the avoidance of therapy with NSAIDs and opioids consumption in order to minimize the acute renal damage from 'hand-drumming'.

Similarly, we believe that it is reasonable to provide a nephrological follow-up to those patients who, although asymptomatic, often report episodes of 'hand-drum pigmenturia' because they are probably more susceptible to kidney damage.

Teaching points

- (1) The use of hand percussion instruments is an underestimated and emerging cause of ARF.
- (2) Drum-related renal damage can achieve a significant degree of severity especially in the presence of factors such as a prolonged rhythmic session, poor hydration, the use of NSAIDs and drug intake.
- (3) Critical to the diagnosis is the association of kidney failure with a history of hand-drumming and rust urine emission.

Conflict of interest statement. None declared.

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