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### **Acute Kidney Injury Associated with Consumption of Starfruit Juice**

Thajudeen MZ *et al.* Starfruit induced acute kidney injury.

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## **Abstract**

### **BACKGROUND**

The study aims to highlight the potential serious complications of acute kidney injury (AKI) resulting from the consumption of excessive amounts of star fruit, a common traditional remedy.

### **CASE SUMMARY**

A 78-years-old male with a past medical history of hypertension, diabetes mellitus and hyperlipidaemia without prior nephropathy presented to the emergency department (ED) with hiccups, nausea and vomiting and generalized weakness. In the preceding 1 wk, he had consumed 3 bottles of concentrated juice self-prepared from 1 kg of small sour star fruits. His serum creatinine was noted to be 1300 UMOL/L from baseline normal prior to his ED visit. He was diagnosed to have AKI secondary to excessive starfruit consumption

### **CONCLUSION**

Consumption of star fruit can cause acute renal failure, with good outcomes when promptly identified and treated

**Key Words:** Acute kidney injury; Acute renal failure; Star fruit; Haemodialysis.

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**Core Tip:** Physicians should have a high index of suspicion on possible interactions and toxicities that may occur with use of traditional medications in combination with prescription drugs in susceptible patients. This report highlights the toxicity of starfruit when consumed as a traditional remedy for diabetes mellitus resulting in acute kidney injury.

## **INTRODUCTION**

The starfruit (*Averrhoa carambola*) is a popular fruit in tropical countries for its nutritional and medicinal benefits<sup>[1]</sup> and used to treat various ailments such as diabetes mellitus, rheumatism, and cough. The starfruit is used as a traditional remedy in Asian countries such as Malaysia and Indonesia to treat diabetes mellitus due to its hypoglycemic properties<sup>[2]</sup>.

Despite its frequent consumption, many people are unaware of the dangers of overindulging in starfruit. When consumed in large quantities, the fruit contains high levels of oxalic acid, which can be nephrotoxic. Starfruit-induced neurotoxicity and nephrotoxicity, which manifests as acute kidney injury (AKI) in individuals with underlying renal dysfunction, is well documented<sup>[3,4]</sup>. AKI in individuals with normal renal function is rare. We present a case report of AKI following consumption starfruit.

## **3 CASE PRESENTATION**

### ***Chief complaints***

A 78-year-old male presented to the emergency department (ED) with hiccups, nausea, vomiting and generalized weakness.

### ***History of present illness***

In the preceding week, he had consumed 3 bottles of concentrated juice which were self-prepared from 1 kg of star fruits. After the ingestion of the third bottle of the fruit juice, he had developed bouts of severe nausea and vomiting without abdominal pain or diarrhoea.

### ***History of past illness***

He had a past medical history of hypertension, diabetes mellitus and hyperlipidaemia.

### ***Personal and family history***

No significant family history

### *Physical examination*

On arrival in ED, his vital signs were stable (temperature was 36.8 °C, pulse rate 60/min, respiratory rate 18/min, and blood pressure 161/78 mmHg) and there was no pitting oedema. Examination of his cardiovascular, respiratory, abdominal and neurological systems were normal

### *Laboratory examinations*

file attached

### *Imaging examinations*

no imaging

## **MULTIDISCIPLINARY EXPERT CONSULTATION**

renal medicine.

## **FINAL DIAGNOSIS**

Acute Kidney Injury

## **TREATMENT**

Haemodialysis

## **OUTCOME AND FOLLOW-UP**

The patient's renal function returns back to normal.

## **DISCUSSION**

Starfruit has several toxins including caramboxin, an excitatory CNS stimulant and oxalate a nephrotoxic agent<sup>5,6,7</sup>. The sour type of starfruit has higher levels of oxalate than the sweet type. Homemade and medicinal supplements often have high

levels of oxalate. When consumed in large amounts, especially when fasting or dehydrated, deposits of calcium oxalate crystals in the renal tubules lead to kidney damage (6).<sup>2</sup> Chronic kidney disease has been identified as a major risk factor for starfruit-induced kidney toxicity. Starfruit juice volume of about 25 mL is known to cause nephrotoxicity in patients with chronic kidney disease. Other known risk factors include dehydration, the amount of starfruit ingested, and taking it on an empty stomach.

Patients with starfruit toxicity show gastrointestinal symptoms such as nausea, vomiting, and abdominal discomfort immediately after ingestion.<sup>1</sup> These are believed to be due to direct corrosive effects of dietary oxalates rather than systemic effects (9). This may be followed by a decrease in urinary output, which can lead to renal dysfunction and acute renal failure. Typical histological findings are the intraluminal and intraepithelial deposition of colourless oxalate crystals. There is no specific treatment for acute kidney damage from starfruit. In patients requiring renal replacement therapy, hemodialysis and hemoperfusion are preferred (8).

Our patient had no evidence of pre-existing renal failure or other contributory factors predisposing to AKI such as sepsis, dehydration, nephrotoxic drugs or obstructive urological causes based on clinical evaluation and tests done. In addition, over the course of four sessions of haemodialysis, he had gradual restoration of his renal function. The temporal relationship between the ingestion of large amount of fruit juice and the onset of symptoms in this case strongly suggests starfruit intoxication as the transient and reversible aetiology likely from resolving oxalate nephropathy.

## CONCLUSION

In Asian countries where starfruit is commonly consumed as a traditional remedy, it is imperative for emergency physicians to be aware of starfruit toxicity in patients with unexplained acute kidney injury. This will help identify and treat these patients promptly to prevent starfruit induced nephrotoxicity.<sup>1</sup> The history is the key to reach an early diagnosis. It is essential to prevent starfruit nephrotoxicity by educating the public

and especially diabetics on the risks of consuming starfruit in excess. Consumption of starfruit as a traditional remedy to control blood sugar levels in diabetics should be discouraged by educating public.

## ORIGINALITY REPORT

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## PRIMARY SOURCES

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