

## A Rare Entity of Bottle Gourd Toxicity with Multiorgan Dysfunction Syndrome

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### Abstract

A 59 years old male was presented to our Emergency Department with complaints of multiple episode of vomiting and fresh blood in vomitus, loose stools and reddish coloured urine after consuming some home made bottle gourd juice. Later he was diagnosed as bottle gourd toxicity with a shock which led to MODS. He was aggressively managed with IV fluids, pantoprazole infusion, antibiotics and other supportive medications. He improved and was discharged in a stable condition after 7 days of hospitalization.

**Keywords:** Bottle Gourd; Bitter Juice; Toxicity; Shock; Multi Organ Dysfunction Syndrome (MODS).

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### Introduction

Bottle gourd, (*Lagenaria siceraria*), also called white-flowered gourd or calabash gourd, opo-squash, long-squash, etc in the west and doodhi, lauki or ghia in the Indian subcontinent, family (Cucurbitaceae), is consumed in various forms worldwide.

It has many medicinal values in treating hypertension, diabetes mellitus, liver disease, constipation and recommended by the dietician in weight control programs and also it is considered as natural antioxidants.

The juice of the bottle gourd is used in the treatment of stomach acidity, indigestion and ulcers. But if the bitter juice is consumed, it causes a toxic reaction in the gut, leading to abdominal discomfort, vomiting, hematemesis and hypotension in rare cases [1,2].

We report a previously healthy 59 year old male who presented with multiple episode of vomiting and fresh blood in vomitus, loose stools and reddish colour urine after consuming some home made bottle gourd juice. He was diagnosed to have bottle gourd toxicity with severe MODS and was managed aggressively.

### Case Report

A 59 years old male was presented to our Emergency Department around afternoon time with complaints of multiple episodes of vomiting with fresh blood in vomitus, loose stools and reddish coloured urine since that morning. He was fine when he woke up in the morning and he had some home-made bottle gourd juice and his symptoms developed after about an hour of its consumption.

He was a known case of DM and HTN and had no known allergies to any medications. On arrival, his vitals were; heart rate of 130 beats/min, BP 60 mmHg systolic, respiratory rate 18 breaths/min, Spo2 on RA of 95%, a temperature of 98.6 degree F and random blood sugar of 332mg/dl. Physical examination revealed that the patient was mildly drowsy but responding to verbal commands with no focal neurological deficit. On systemic examination his tongue was dry, but no cyanosis, edema or rash, his abdomen was soft and no tenderness, bowel sounds were present and no organomegaly. He was started on 2 litres of IV fluids (and was continued), IV pantoprazole infusion, 1 gm of injection tranexamic acid and injection insulin 10 unit. Ryle's tube was inserted for gastric lavage in which 20 ml of dark

gastric content came out. Also foley's catheterisation was done in which 100 ml of dark colour urine passed. Since BP did not improve after fluid bolus, inotropes had to be started. All routine investigations like CBC, LFT, KFT, ABG, coagulation profile were sent.

His ABG showed metabolic acidosis with pH of 7.25.

He passed around 500-600 ml of urine since that morning in total.

The laboratory report showed leukocytosis (TLC of 18.7), and impaired renal and liver function (urea of 166mg/dl, creatinine 3.8, SGOT 268 U/L, SGPT 290.6 U/L), and HbA1c 9.9%.

Urgent Gastroenterologist and Nephrology references were done and he was shifted to ICU, with a provisional diagnosis of bottle gourd toxicity with MODS and shock.

His repeat ABG after 1 hour was worse severe metabolic acidosis with pH of 7.18.

Interestingly, his wife gave the history that they have started taking home-made bottle gourd juice for 3 days, but that day the juice was bitter in taste. They both started having similar symptoms with the wife having milder symptoms.

His wife was also advised admission and investigations, but she agreed only for investigations.

#### *Course in the Hospital and Outcome*

The patient was shifted to ICU with BP of 90mmHg systolic on inotropic support.

He underwent endoscopy which revealed diffuse ulceration in the stomach involving cardia, body and antrum and also diffuse ulceration in 1<sup>st</sup> part of duodenum.

His repeat samples in the following morning showed some improvement, but he was still on inotropic support.



Fig. 1: Upper GI Endoscopy

The patient was managed aggressively with adequate fluid resuscitation and other supportive measures. His condition started improving after 48 hours of hospitalization and was shifted to ward

on the 4<sup>th</sup> day and got discharged in stable condition after 7 days. All routine investigations repeated and were found within normal limits.

His wife's initial reports also showed mild derangements in her liver and kidney function tests, but her repeat samples showed improvement.

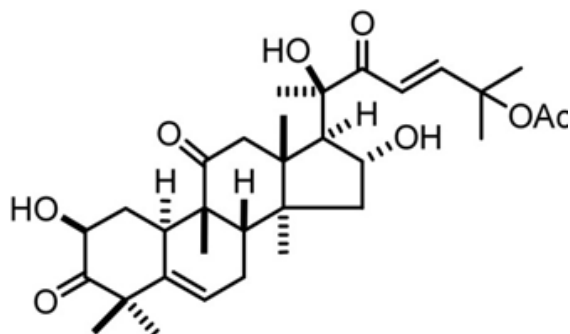
#### **Discussion**

We report a rare case of bottle gourd toxicity after consuming its bitter juice. The patient in this report presented with multiple episode of vomiting and fresh blood in vomitus, loose stools and reddish colour urine after consuming home made bottle gourd juice (Figure 2).



Fig. 2: Bottle Gourd Juice (Courtesy: Google Image)

The bottle gourd (*Lagenaria siceraria*) is popularly known as *lauki*, *ghia* or *dudhi* in India. Consumption of a glass of bottle gourd on an empty stomach is thought to work as a health tonic and also considered a remedy for diabetes, heart disease, hypertriglyceridemia, constipation, liver diseases, urinary problems, depression, etc. by the Ayurveda practitioners [1,3]. Bottle gourd, which belongs to the cucumber family (Cucurbitaceae) can be dangerous as it can also turn toxic. Cucurbitacins are complex compounds found in plants belonging to the Cucurbitaceae family. The tetracyclic triterpenoid Cucurbitacin compounds are responsible for the bitterness in bottle gourd and there are cucurbitacins types of B, D, G, and H. High levels of Cucurbitacin compounds which cause toxic effects are due to high temperature, wide temperature swings, low pH, very little water, low soil fertility, and also due to improper storage of vegetables or over-matured bottle gourd. The molecular formula is C<sub>32</sub>-H<sub>48</sub>-O<sub>8</sub> and the structure of tetracyclic triterpenoid cucurbitacin which is shown in Figure 2.



**Fig. 3:** Structure of Tetracyclic Triterpenoid Cucurbitacin (Courtesy: Google Image)

These toxins, when absorbed into the blood could cause hepatitis, pancreatitis, cholecystitis, and renal damage and finally it can lead to multiorgan dysfunction, which could be life threatening condition [3,4,5].

Adverse reactions appeared within 30 min after consumption of the bottle gourd juice, which was bitter in taste. The amount of juice should be less than 100ml and over 200 ml proved to be fatal, but in some cases even 50 ml of bitter bottle gourd juice can produce complications. Cucurbitacins have shown promising pharmacological properties in animals such as anti-tumorigenic effects (in-vivo, in-vitro), cytotoxic effects, and increased capillary permeability leading to hypotension and ascites and pleural effusions. An intraperitoneal lethal dose for pure Cucurbitacins reported in the mouse is 1.2 mg / kg. The intravenous lethal dose reported in cat is 1 mg / kg, and in rabbit 6 mg / kg, respectively [4,5].

A 59 years old scientist, Sushil Kumar Saxena, a Deputy Secretary at the Council for Scientific and Industrial Research (CSIR), New Delhi who died after consuming the Bottle Gourd juice mixed with bitter gourd (Karela in hindi), spurred an investigation into the consumption of bottle gourd juice that is bitter. He was taking this juice to control his diabetes. His diabetic 56-year old wife, who also took the bottle gourd juice and karela juice has barely survived. She was in hospital for a week. Similarly, in this case also the patient's wife had also consumed the same juice, but she had milder symptoms and not so serious as her husband. The death of Mr. Sushil Saxena led to the information by an expert, committee on the safety of consumption of vegetable juice with special reference to the bottle gourd. The matter was discussed in the Parliament, and Department of AYUSH, Ministry of Health and Family Welfare, gave an assurance in Lok Sabha states that the entire matter

will be investigated by a team of medical officers and scientists. Hence, after so many research and committee meeting, in 2011, Indian Council of Medical Research (ICMR) stated that "Do not drink the Bottle Gourd juice if it tastes bitter, it could kill you" [6,7,8,9].

Dr. Charu Dua, chief nutritionist at the Max Superspeciality Hospital, said, "It's of vital importance that people check the lauki (Bottle Gourd) before drinking its juice. If bitter, it carries a highly toxic compound called Tetracyclic Triterpenoid Cucurbitacins that cause serious side effects and even death. However, as a vegetable it is healthy because it contains a lot of water. This makes it very low in calories [7]."

### Management

Any case that comes with the symptoms of any discomfort like nausea, vomiting and gastrointestinal bleeding after consumption of bottle gourd juice should be treated immediately, and details of quantity of juice and its taste should be recorded. Since there is no specific antidote available, treatment is all supportive management, intravenous fluids, crystalloids/blood products/fresh frozen plasma should be given to maintain the hemodynamic and electrolyte balance and also Proton pump inhibitors should be given to patients with gastrointestinal mucosal injury. Gastric lavage should be done by inserting a Ryle's tube to assess gastrointestinal (GI) bleed and the aspirate should be preserved. As in this case also, management were gastric lavage and supportive [1,3,4,9].

### Investigation

Prothrombin time, platelet counts, serum amylase, blood sugar, X-Ray chest, echocardiogram (ECG), ultrasound, and endoscopy should be done at the earliest [4,5].

### *In this Case Report we Considered Some of the Differential Diagnosis*

- Sepsis with multi-organ dysfunction with septic shock with the focus of infection in the gastrointestinal tract. But in this case there were no fever and no any growth on urine, blood and stool culture.
- GI bleeds (bleeding peptic ulcer, esophageal variceal bleeding, etc.) with haemorrhagic shock and organ dysfunction but there was no previous predisposing factors.

- Food poisoning or foodborne illness due to preformed toxins of *Staphylococcus aureus*, or *Bacillus cereus* in which symptoms start 1 to 6 hours and 10 to 16 hours after ingestion of food infected with *Staphylococcus aureus* and *Bacillus* respectively.
- Cardiac cause for the hypotension/shock, but again there was no cardiac signs and symptoms like chest pain, palpitations and echocardiography shows a normal ejection fraction [5].

### Conclusion

Bottle gourd toxicity is a rare case, but if it occurs, can lead to severe gastrointestinal bleeding, shock and Multi Organ Dysfunction Syndrome (MODS) and it can be fatal. Hence being an emergency physician should know the signs and symptoms of bottle gourd toxicity and its complication and should take immediate resuscitative measures to maintain the hemodynamics. Patients should be asked if the plant tasted unusually bitter and should also ask the amount consumed [1,4,5].

As the bottle gourd is commonly consumed and considered as a tonic for many medical illnesses, A public awareness should be assured and the following advised should be given.

- It is advisable to consume cooked bottle gourd. Once cooked, the bottle gourd becomes harmless, offering health benefits.
  - A small piece of bottle gourd should be tested before extracting the juice to ensure that it is not bitter.
  - If bitter, it should not be consumed at all instead it should be discarded as bitter taste is due to the toxic compound tetracyclic triterpenoid Cucurbitacin.
  - Bottle gourd juice should not mix with any other vegetable juice.
- In case of any discomfort (abdominal pain, cramps, nausea, vomiting, diarrhoea or any feeling of uneasiness) after consuming the bottle gourd juice, should immediately rush to the nearby Emergency Department as it can be a bottle gourd toxicity which is highly fatal if not treated in time [1,4,9,10].

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