

Intentional Self-harm Human Poisoning with Agricultural Micronutrient Foliar Spray: From Rural India of Southern Karnataka

Sir,
 Micronutrients and macronutrients are elements with specific and essential psychological functions in plant metabolism. Compared to macronutrients, micronutrients are essential for plant growth in smaller amounts and play an important role in balanced crop nutrition.^[1] Foliar sprays are widely used to supply micronutrients.^[2] We are reporting a patient who presented with intentional self-harm using fatal toxicity of plant micronutrients [Figure 1].

A 36-year-old female, homemaker, was brought to emergency department of a tertiary care hospital with chief complaints of altered sensorium and breathlessness. The patient had a history of alleged consumption of approximately 400 ml poison “Micro Magic –micronutrient foliar spray” (label claims it consisting of Zn [3.00%], Fe [2.00%], B [0.50%] [Figure 2], and Mn [1.00%]) 5 days ago and was treated at a local hospital. She was initially treated symptomatically with gastric lavage and was started on antibiotic cefoperazone. On the 5th day, her renal and hepatic functions were deteriorated, and she was shifted to tertiary care hospital.

During the admission, a patient was in altered sensorium and was hypoxic (94% oxygen saturation). Her pulse rate was 108/min and blood pressure was 150/100 mmHg. Laboratory data revealed renal failure with urea 207 mg/dl and creatinine 10 mg/dl and abnormal liver function (aspartate aminotransferase - 603 IU/L, alkaline phosphatase - 282 IU/L, and alkaline phosphatase (ALP) - 143 IU/L) with mild thrombocytopenia (109,000 mcL). Chest X-ray was suggestive of pulmonary edema and cardiac echocardiography

showed left ventricular dysfunction. She also had metabolic acidosis (pH - 7.25, PCO₂-19.2, PO₂-80, SpO₂-94%, and HCO₃-10.7). Electrocardiography showed sinus tachycardia; however, there was increased troponin T (0.299) and NT-proBNP (4999) suggestive of myocarditis probably due to Micro Magic consumption.

The patient was treated symptomatically along with supportive and general nursing care in the absence of any known antidote. In view of worsening hypoxia and acidosis, she was ventilated and also underwent multiple episodes of hemodialysis in view of worsening renal failure. Injection levosimendan infusion was started in view of left ventricular dysfunction with low ejection fraction. During a course of hospital stay, the patient developed ventilation-associated pneumonia, for which she was started on injection meropenem. However, patient condition progressively deteriorated and was expired on 7th day of hospital admission due to sepsis and multiorgan dysfunction.

The alleged poison sample was collected for toxicological analysis. No definite results regarding contents were found, except those mentioned on the label.

This case report demonstrates a clear relationship between micronutrient toxicity and the development of multiple organ dysfunctions. A literature search revealed no case reports evidencing such kind of poisonings. The literature does reference similar toxic effects with the heavy metal poisoning with iron, copper, and lead can cause toxic myocarditis.^[3] Severe iron overload can manifest as iron-induced myocarditis,



Figure 1: Micronutrient foliar spray



Figure 2: List of spray contents

cardiac failure, and acute hepatic dysfunction.^[4] Renal failure probably associated with other trace elements such as lethal doses of zinc and boron.^[5]

With the increasing use of micronutrients in agriculture, awareness regarding safety handling and appropriate labeling precautions of such products has to be carried out through proper channels.

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Conflicts of interest

There are no conflicts of interest.

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