Extensive T wave inversions on electrocardiogram following *Kaneru* (*Thevetia peruviana*) poisoning

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Deliberate self harm with the ingestion of *Kaneru* seeds has become a popular method of suicide in rural areas of Sri Lanka. Its poisoning causes varying degrees of conduction defects in cardiac tissue. We report a 17-year-old young girl who presented with extensive T wave inversions on ECG which prevailed for four months duration following acute yellow oleander poisoning.

Keywords: plant poisoning; Kaneru; yellow oleander; *Thevetia peruviana*; digoxin

Introduction

Kaneru or yellow oleander (*Thevetia peruviana*) and *Niyagala* (*Gloriosa superba*) are two common plant poisoning in Sri Lanka.^{1,2} Ingestion of *Kaneru* seeds was a popular suicidal method in northern Sri Lanka in last 2-3 decades.^{2,3,4} Yellow oleander is a small ornamental tree of the apocyanaceae family which grows all over Sri Lanka and India. It is wildly grown in gardens for its beautiful yellow flowers. The active poisonous substance of yellow oleander is digoxin, a cardiac glycoside which mainly causes conduction defects in heart. Therefore, clinical profile of its poisoning is very similar to digoxin overdose. All parts of the plant such as fruits, seeds, flowers, milk and leaves (Figure 1) are poisonous. But seeds contain high amount of cardiac glycosides.³

Case report

A 17-year-old previously healthy school girl was transferred from a local hospital for further management of yellow oleander poisoning. She had ingested four *Kaneru* seeds and was admitted to the local hospital around one hour after the ingestion.

She found the plant from her neighbouring home garden. She was given gastric lavage and a single dose of activated charcoal at the local hospital.

(A)

(B)

On admission to the medical unit she had no complaints; her blood pressure was 110/70 mmHg; pulse rate was 94 beats/min. Bilateral lung fields were clear. Other examination findings showed no abnormality.

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(C)

(D)

Figure 1: (A), (B) Yellow oleander (*Thevetia peruviana*) plant (C), (D) Its fruits, flowers, seeds, and leaves

Her laboratory investigations were K^+ - 3.8 mmol/L (3.5-5.1), Na^+ - 138 mmol/L (135-145), WBC - $9.4 \times 10^3/\mu L$, neutrophils- 74%, Lymphocytes - 22.3%, platelets- $314 \times 10^3/\mu L$, Hb - 13.3g/dL, blood urea- 2.2mmol/L, serum creatinine - $61\mu mol/L$, SGOT- 26U/I, SGPT- 18.5U/I, ALP- 240U/I, Total bilirubin- serum creatinine - $61\mu mol/L$, SGOT- 26U/I, SGPT- 18.5U/I, ALP- 240U/I, Total bilirubin- $15.8\mu mol/L$.

On admission ECG showed T wave inversions on Lead II, III, aVF and V_1 - V_6 (Figure 2).

Figure 2: Extensive T wave inversions on ECG

(on admission) -12 hours after the poisoning

She was immediately given multiple dose activated charcoal and continuous cardiac monitoring was carried out with serial ECGs. But troponin I or 2D-echo could not be done at this stage. Following day, she was clinically normal and her serum K^+ level was 3.7mmol/L and Na^+ level was 137mmol/L. But same ECG changes were present throughout the hospital stay. She was discharged on the 4th day of the ingestion after having psychiatric assessment and closely followed up ECGs with cardiac assessment. Two months after the ingestion, her ECG showed disappearance of T inversions of Lead II, V_5 and V_6 (Figure 3). However, her ECG was completely normal only after about four months of the poisoning.

Figure 3: ECG-Two months after the poisoning (T wave inversions on lead III, aVF and V₁-V₄)

Discussion

Cardiac glycosides of *Kaneru* seeds (digoxin) are toxic to cardiac myocytes and autonomic nervous system.⁵ It inhibits Na⁺ / K⁺ ATPase transport mechanism in myocardial and cardiac conducting tissues and causes reduction of the conduction velocity in nodal and myocardial tissue. As a result, conduction defects affecting the sinus and AV nodes may occur. The lethal dose is about 4 to 7 seeds.^{3,6} Varying degrees of heart blocks, arrhythmias, bradycardia, ischaemic changes (T wave changes and ST depressions), atrial and ventricular ectopics have previously been reported following *Kaneru* poisoning.^{3,5,7,8} In addition, patients may get hypotension, hyperkalaemia, yellow vision, convulsions, nausea and vomiting due to its poisoning.⁹ The seeds are highly irritant and cause discomfort to gastrointestinal tract inducing persistent vomiting and diarrhoea in severe poisoned patients. Hyperkalaemia exacerbates cardiac arrhythmias and is a marker of poor outcome in yellow oleander poisoning.⁵ However, our patient had normal serum K⁺ levels throughout hospital stay. She only got extensive T wave inversions on limb and chest leads and they remained on the ECG for about four months following the poisoning. However, there are no data available in literature regarding followed up ECG findings for these patients. Therefore, it is advisable that these patients should be followed up in view of assessing cardiac functions.

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