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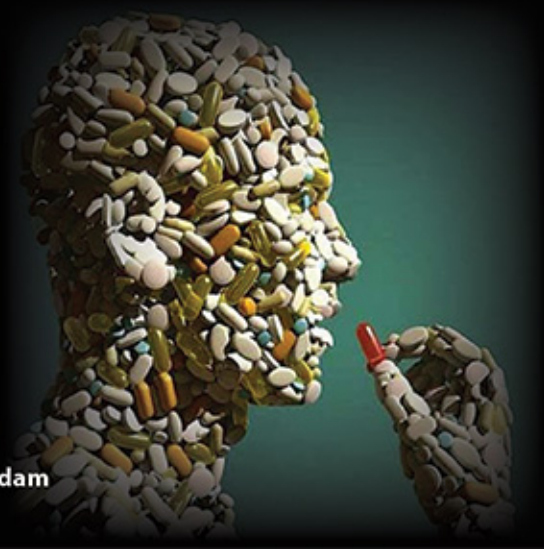
Diagnosis & Treatment of Poisoning and Drug Overdose Made Easy®

TV Devarajan



Foreword
KV Thiruvengadam

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Chapter 4

Antiarrhythmic poisoning

Lethal toxicity from proarrhythmic effects occurs in 5–15 percent of patients treated by antiarrhythmic drugs. This toxicity can also occur due to accidental or suicidal overdose. The knowledge of arrhythmia, and its underlying heart disease, antiarrhythmic drugs and its pharmacokinetics, drug interactions and supportive care for toxicity is vital in therapy.

Actions of antiarrhythmic drugs

- **Class Ia (Quinidine):** Depresses conduction, increases PR and QRS interval on surface ECG.
- **Class Ib (Tocainide):** Depresses conduction further in abnormal tissue.
- **Class Ic (Flecainide):** Significant increase in PR and QRS interval on surface ECG.

Class 1a and 1c drugs can cause Torsades de pointes. The margin of safety between the antiarrhythmic dose resulting in arrhythmia suppression and that resulting in toxicity is narrow. An underlying heart disease can get aggravated during toxicity. Incessant ventricular tachycardia can occur in people with history of ventricular arrhythmias or poor left ventricular function. Hypokalemia, hypomagnesemia and bradycardia may aggravate serious ventricular arrhythmias.

General management

Toxicity due to therapeutic dosing can be diagnosed with the clinical and electrocardiographic assessment and managed with dosage adjustment. Plasma drug levels should be monitored whenever necessary. In toxicity due to acute overdosage the signs and

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symptoms and management of overdose toxicity are more or less same in most of the antiarrhythmic drugs. We follow the following schedule in the management.

Class Ia agents

Quinidine and procainamide are used to suppress chronic ventricular ectopy, lethal ventricular arrhythmias and primary atrial tachyarrhythmias. Oral quinidine causes gastrointestinal disturbances and cinchonism with tinnitus, visual changes and hearing loss. Severe poisoning causes hypotension, seizures and depression of cardiac conduction. In one case intra-aortic balloon pump was necessary. Repeated doses of activated charcoal and intravenous hypertonic sodium bicarbonate are to be given for response.

Procainamide poisoning causes gastrointestinal intolerance, leukopenia, arthralgia, pleuritis, fever and pericarditis. In toxic doses, it can cause hypotension, QRS widening and ventricular arrhythmias. Hypertonic sodium bicarbonate is useful in procainamide toxicity.

Class Ib agent

Lidocaine is used in treatment of ventricular arrhythmias and toxicity occurs by errors in dosing and administration. Neurological symptoms precede cardiotoxicity, visual disturbances, drowsiness, confusion, seizures, coma, respiratory arrest and cardiovascular collapse occurs. Life-threatening toxicity can result in hypotension and 3rd degree AV block. A temporary pacemaker is useful for bradyarrhythmias, diazepam for convulsions, fluids and pressor amines for hypotension and sometimes extracorporeal circulatory support may be required.

Class Ic agent

Flecainide poisoning producer CNS symptoms like dizziness and ataxia. In acute poisoning ventilatory support, pressor amines, cardiopulmonary resuscitation and repeat cardioversion may be necessary. Hypotonic sodium bicarbonate may be necessary.

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Class III agents

a. Amiodarone can cause long time toxicity leading to pulmonary fibrosis. Amiodarone can cause elevation of T4 causing hyperthyroidism. Corneal deposits, peripheral neuropathy, blue-gray skin discoloration are chronic obligations. Overdosage of amiodarone may require hemoperfusion and repeated doses of activated charcoal.
b. **Sotalol:** Side effects of sotalol are similar to beta blocker toxicity. Bradycardia, hypotension, prolonged QT interval and Torsades de pointes have developed in sotalol toxicity. Hemodialysis and supportive therapy with glucagon is advised.

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Diagnosis & Treatment of Poisoning and Drug Overdose Made Easy®

This book *Diagnosis and Treatment of Poisoning and Drug Overdose* was long-awaited by medical students, postgraduates, general practitioners, casualty medical officers and ICCU doctors. This book has been prepared keeping in mind the necessity for guiding junior doctors and doctors in CCU to give first-aid, investigate and give proper antidote for drug overdose. Detailed descriptions have been given with charts and figures for diagnosis and treatment of poisoning and drug overdose. Specific antidotes have also been mentioned. A chapter on 'Envenomation by Snakes' has also been given. Initial assessment of the patients and appropriate antidote in saving patients, who have been brought to the emergency with history of consuming poison or drug for suicidal purpose or accidentally, have been discussed. One chapter has been added for diagnosis and treatment of poisoning and drug overdose by pregnant women. This book will be definitely useful in the armamentarium of emergency medical care.



TV Devarajan is a Senior Consultant Physician, Apollo Hospitals, Chennai, India. He Has served as honorary teacher in medicine for 27 years in Madras Medical College teaching undergraduates and postgraduates in medicine, and has been a Professor of Medicine, Aarupadai Veedhu Medical College (AVMC), Puducherry, India. He has a brilliant academic career, winning gold medals and prizes in MBBS. He completed his MD from Stanley Medical College, Chennai, in 1974. He was awarded 'Dr BC Roy National Award' as eminent medical teacher by the Medical Council of India, and was conferred by the President of India in 2003; and also awarded 'Padmashree' by the President of India. He was awarded FRCP by Glasgow University, UK, in 2007; and DSc (Honors) by Dr MGR Medical University in 2009. He is the author of the books *Clinical Medicine Made Easy, Medicine in Nutshell* and *Makal Nalan Maruthuva Arivu*.

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