



Contents lists available at ScienceDirect

Indian Journal of Medical Specialities

journal homepage: www.elsevier.com/locate/injms



Review article

Acute recreational drug toxicity: An update

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ARTICLE INFO

Article history:

Received 27 March 2018
Received in revised form 3 April 2018
Accepted 4 April 2018
Available online xxx

Keywords:

Acute recreational drug toxicity
Drug intoxication
New psychoactive substances
Recreational drugs
Harm reduction

ABSTRACT

Toxicity due to recreational drug use is now considered more of a public health problem. There is a paradigm shift in usage from classical recreational substances like alcohol, cannabis, opioids, cocaine and benzodiazepines to new psychoactive substances like ecstasy, lysergic acid diethylamine, ketamine, gamma hydroxybutyrate and flunitrazepam. There is varied presentation with symptoms of toxicity due to drug use. This is so, as different types of drugs are coming up and it happens that more than one drug is taken at a time by users. Laboratory detection of these recreational drugs may be difficult in some cases as they remain for shorter time in body. There is significant morbidity and mortality associated with drug use. This may consist of hyperthermia, hypertension, electrolyte imbalances, seizures, intra-cerebral bleed, respiratory depression, cardiac arrest, acute renal injury, agitation, panic attacks, acute psychosis, delirium and coma. Management of cases of toxicity is mostly supportive as antidotes are available with few drugs only. Management consists of maintaining airway and oxygenation, hydration, calming the patient and treating the complications seen. As total abstinence from recreational use of drug is a utopia, harm reduction approach may be a useful option but this needs further research

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Contents

1. Introduction	00
2. Epidemiology	00
3. Classification of recreational drugs	00
4. Clinical effects	00
4.1. Alcohol	00
4.2. Cannabis	00
4.3. Heroin and other opioid derivatives	00
4.4. Cocaine	00
4.5. 3,4-Methylene dioxymethamphetamine	00
4.6. Lysergic acid diethylamide	00
4.7. Gamma hydroxy butyrate	00
4.8. Flunitrazepam (Rohypnol)	00
4.9. Solvents	00
5. Management	00
6. Harm reduction	00
7. Conclusion	00
Competing interests	00
References	00

1. Introduction

Recreational drug use is a growing problem in modern societies. Recreational drugs when consumed occasionally may not have any

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addictive potential. However, an individual may develop tolerance very soon with most of them and can become subsequently dependent on them. Recreational drug may be defined as “a drug used without medical justification for its psychoactive effects often in the belief that occasional use of such substance is not habit forming or addictive” [1].

As per the World Drug Report 2017, around 29.5 million people suffer from drug use disorders globally. This constitutes 0.6% of the total world population [2]. Cases with drug toxicity present to emergency department (ED) and intensive care unit (ICU) facilities and in 85% cases, the reason for drug use is recreational [3]. The classic recreational drugs like alcohol, cannabis, heroin, cocaine and benzodiazepines continue to be the most commonly used substances that present to ED. But in recent years, the use of new psychoactive substances (NPS) has been emerging. This is due to the loopholes in legal measures in place and the demand of market for different varieties of substances which are cheaper and having desired pharmacological effect [3]. Some 739 NPS were reported to United Nations Office on Drugs and Crime (UNODC) from 106 different locations during the period 2009–2016 [2]. These NPS stay in the body for a lesser time and not detectable in usual drug screening assays. Hence, they can dodge the existing legal regulations and provide the similar effect like the existing other recreational drugs [2].

The toxic manifestations of recreational drug use may present as respiratory, cardiac or musculoskeletal problems, cognitive defects, and hypoxic injury to brain, renal problems and physical injuries. Deaths are reported rarely and it is seen mostly with intentional drug overdose. The management of such cases is done mostly in ED itself and a small proportion of those may be admitted to ICU. There are very few specific antidotes available, so management is symptomatic and consist of respiratory support, hemodynamic stabilization and procedures that clear out the substance from the body. Things become difficult to manage when an unknown substance is taken or a cocktail of drugs are taken [3,4].

2. Epidemiology

A quarter of the world population has history of lifetime drug use. Knowing the epidemiological determinants is important from public health point of view.

It is seen that 0.35–2.1% of persons with acute recreational drug use may present to ED with toxicity. In 3.86–19% of the cases who are presenting to the ED, are admitted to ICU for intensive care and close monitoring [3,5–7]. The most common age group for presentation is 20–39 years. Males outnumbered females and constituted up to three quarter of presentations. The presentation of persons seeking treatment was seen more on weekends and least on Tuesdays. The persons presented to emergency mostly from 8:00 pm to 8:00 am and peak time was around mid night to 1:00 am. There appears seasonal variation and more cases were seen in summer than winter months [3,5,7]. The prevalence of recreational drug use is as high as 44.2–52.5% in vulnerable

populations like those on HIV treatment and Men who have sex with Men (MSM) population [8,9].

In more than three fourth of the cases presenting to emergency were discharged from there only and those admitted to ICU, the average duration of stay ranged mostly from 24 to 48 h. Deaths are reported in 0.2–4% of cases who were admitted to ICU [3,10,11].

3. Classification of recreational drugs

This can be broadly divided into classical recreational drugs and new psychoactive substances (NPS). The classic recreational drugs consist of alcohol, cannabis, heroin & other opioid derivatives, cocaine and benzodiazepines. The new psychoactive substances include 3,4-methylene dioxymethamphetamine (MDMA), Gamma hydroxybutyrate (GHB), Ketamine, Lysergic acid diethylamine (LSD), Rohypnol (flunitrazepam) and Methamphetamine [4].

Based on chemical effects recreational drugs may be classified as Stimulants, depressants, opioid and related derivatives and hallucinogens. The characteristics are shown in Table 1.

There is a wide variability in the NPS group. Based on chemical structure they can divided into three groups: the piperazines, phenethylamines and tryptamines. Their neurochemical actions are shown in Table 2.

4. Clinical effects

4.1. Alcohol

The effects associated with alcohol are dose dependent as shown in Table 3.

The appearance of the clinical effects depends upon factors like alcohol concentration, amount of alcohol taken, time taken to ingest alcohol, body weight and tolerance of the individual.

Alcohol intoxication may result in gastrointestinal problems like nausea, vomiting, abdominal pain leading to dyselectrolytemia like hyponatremia, hypokalemia, hypomagnesemia. It may also lead to metabolic imbalances like lactic acidosis, hypoglycemia. Diaphoresis, tachycardia and acute cardiac effects like ventricular arrhythmia and new onset atrial fibrillation may be seen in severe intoxication. Respiratory depression is a life threatening condition. This is also associated with decreased sensitivity of respiratory tract to foreign bodies, decreased ciliary clearance and aspiration adding up to more risk [15,16].

4.2. Cannabis

9 delta tetrahydrocannabinol (9 delta THC) in cannabis acts as partial agonist on cannabinoid 1 (CB1) receptor which is distributed across various parts of brain. Synthetic cannabinoid (SC), were originally synthesized for research purpose but were later used recreationally. They are more potent than 9 delta THC in cannabis and are partial or full agonist at CB1 receptor causing more severe and lasting intoxication. [13,17]

Table 1
Classification of recreational drugs based on neurochemical effects [12,13].

Drug	Example of drug	Characteristic features
Stimulants	Cocaine, mephedrone, MDMA	Makes feel energetic, alert, talkative, active and excited.
Depressants	Benzodiazepines, alcohol	Makes feel relaxed, chilled out, mellowed
Opioid and related derivatives	Heroin, Codeine syrups, Buprenorphine.	Makes feel drowsy, rush of pleasure and dreamy state.
Hallucinogens	LSD, Ketamine, Cannabis.	Makes feel detached from your surroundings, mood swings, altered time and space, perceptual disturbances and mystical or religious experiences.

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