New Psychoactive Substances and Stimulants

Gilberto Gerra
Chief
Drug Prevention and Health Branch
<table>
<thead>
<tr>
<th>Drug</th>
<th>Million</th>
<th>%</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heroin</td>
<td>53.3</td>
<td>1.08</td>
<td>53.3</td>
</tr>
<tr>
<td>Prescription opioid</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cocaine</td>
<td>18.0</td>
<td>0.37</td>
<td></td>
</tr>
<tr>
<td>Amphetamines</td>
<td>28.9</td>
<td>0.59</td>
<td>68.2</td>
</tr>
<tr>
<td>Ecstasy</td>
<td>21.3</td>
<td>0.41</td>
<td></td>
</tr>
</tbody>
</table>

Past year, World Drug Report 2019
Stimulants among NPS

Methyl-meth-cathinone (Mephedrone)

Phenethylamines

Benzylpiperazine

Synthetic cannabinoids
Services for people affected by stimulants use disorders and NPS use:

- Not available
- Unprepared
- Empty
- Not appealing
- Laboratory inability
- Counselling
- Psychosocial interventions only
Among 189 cases of drug intoxications at emergency departments and intensive care units in Sweden

50 substances identified:
- synthetic cannabinoid receptor agonists ("Spice")
- piperazines
- substituted phenethylamines
- synthetic cathinones
- hallucinogenic tryptamines

Helander et al., 2014
New psychoactive substances as adulterants of controlled drugs. A worrying phenomenon?

173 samples believed to be MDMA, amphetamine, cocaine, mescaline, or methamphetamine.

The NPS adulterant most frequently observed 2-(4-bromo-2,5-dimethoxyphenyl)ethanamine (2C-B)

- 69 different combinations of substances were detected:
  - 20 involving a controlled drug combined with an NPS
  - 49 involving one or more NPS that substituted the controlled drug

Giné et al., 2014
Users attributed greater risks to the use of new drugs and preferred the effects of traditional drugs:
- depression (55.2% of users),
- concentration difficulties (44.0%),
- feelings of fear and anxiety (39.4%),
- tingling in the arms or legs (34.4%).
Mephedrone, 4-methylethcathinone (4-MMC) or 4-methylephedrone:

Releasing dopamine/norepinephrine
Dopamine transporter inhibitor
Stimulant effects

Teeth grinding, cardiovascular problems, behavioural undercontrol

**Bath salts** containing substituted cathinones
Phenethylamine, β-phenethylamine, or phenylethylamine

Monoamines uptake inhibitors. Stimulant effects 2C series.

Inhibitors of Mono Amine Oxidasis
Piperazine
organic compound

GABA (γ-aminobutyric acid) receptor agonists
Serotonin agonists
Piperazines

Clozapine

Olanzapine

4-Bromo-2,5-dimethoxy-1- benzylpiperazine (2C-B-BZP)

1-Benzylpiperazine (BZP)

2,3-Dichlorophenylpiperazine (DCPP)

4-Chlorophenylpiperazine (pCPP)

Sold as ecstasy

Stimulant / hallucinogenic effects
Synthetic Cannabinoids (Spice)

Agonists on cannabinoid receptors

Aminoalkylindole (Naphthoylindoles)

Psychosis – Cardiovascular disorders
Clin Toxicol (Phila).

A systematic review of adverse events arising from the use of synthetic cannabinoids and their associated treatment.
Tait et al., 2016

**Major complications:**
myocardial infarction
ischemic stroke and emboli
acute kidney injury
generalized tonic-clonic seizures
psychiatric presentations
first episode psychosis
paranoia
self-harm/suicide ideation
hyperemesis
Australas Psychiatry.

**Signs and symptoms associated with synthetic cannabinoid toxicity: systematic review.**
Courts et al., 2016

Clinicians in emergency services should consider synthetic cannabinoid toxicity when evaluating young adult patients presenting with unexplained agitation and/or cardiovascular symptoms.
Tryptamines: monoamine alkaloid found in plants, fungi and animals

Binding serotonin receptors – hallucinogenic effects

Psilocybin (O-phosphoryl-4-hydroxy-N,N-dimethyltryptamine)
α-methyltryptamine
N,N-diisopropyltryptamine
4-hydroxy-N-methyl-N-ethyltryptamine
Marijuana, alcohol, "Molly" (MDMA), cocaine.

75% of the participant: positive toxicological analyses

Of those positive samples, 36%: one or more NPS
higher levels of psychological distress

frequent binge drinking
Recent changes in the clinical features of patients with new psychoactive-substances-related disorders in Japan: Comparison of the Nationwide Mental Hospital Surveys on Drug-related Psychiatric Disorders undertaken in 2012 and 2014. Matsumoto et al., 2016

the number of patients dependent upon NPS increased

the number of those exhibiting social dysfunction increased
The main desired effects of NPS use were empathy and increased ability to socialise.
Addict Behav.

Characterizing users of new psychoactive substances using psychometric scales for risk-related behavior.

Vreeker et al., 2017

NPS users had

higher scores for sensation seeking impulsivity compared to drug users.

lower scores for risk perception compared to drug users.
NPS use was identified in 22.2% of admissions, contributing to psychiatric symptoms in 59.3%.

drug-induced psychosis was significantly more likely in NPS users.
The NPS use in patients with Severe Mental Illness is probably underestimated.

acute symptom exacerbation of pre-existing psychosis

Paranoid, mood, and aggression symptoms occur more frequently.
Mind navigators or chemicals' experimenters?
A web-based description of e-psychonauts.
Orsolini ...Schifano, 2015

Psychonauts typically considered themselves as "psychedelic researchers," "new Shamans," "philosophers," "alchemists."

- a set of key skills,
- attention to their inner "soul"
- high standards of knowledge about drugs' chemical and pharmacological issues
- high levels of both IT skills and verbal fluency
Evolutionary Considerations on the Emerging Subculture of the E-psychonauts and the Novel Psychoactive Substances: A Comeback to the Shamanism?
Orsolini... Schifano, 2017

Modified status of conscience
Self - transcendence

Reference to Shamanism
encompassing self-knowledge

auto-gnostic use of psychedelic drugs

self-enhancement by rehearsing personal coping strategies

spirituality
Values and beliefs of psychedelic drug users: a cross-cultural study.
Lerner and Lyvers, 2006

Psychedelic users scored significantly higher on:

- mystical beliefs: oneness with God and the universe
- life values of spirituality and concern for others
- coping ability
“the desert of the real” can be uncovered by swallowing the red pill

there exists a pill—or a particular substance encapsulated in a pill—that shows reality in its “true” form

Transcending mental boundaries: psychedelic drugs and demystification
Lifestyle use of drugs by healthy people for enhancing cognition, creativity, motivation and pleasure.

Increasing use of cognitive enhancers by healthy individuals raises safety, ethical and regulatory concerns, which should not be ignored.

Understanding the short- and long-term consequences of the use of NPS, as well as better understanding the motivations and profiles of users could promote more effective prevention.
Methamphetamine use significantly increased among treatment-seeking opioid users (+82.6%, p < .001)

synergetic high, balanced out the effects of opioids to function "normally"
296 (50.0%) reported injecting both drugs during the past 12 months.

Pattern characterized by injection of both methamphetamine and heroin

Injecting both heroin and methamphetamine was associated with a 2.8 fold increase in reported overdose.
The rate of dependent use had increased since 2009-10.

2.09% for regular non-dependent use
Increased use of methamphetamine among drivers: fatal accidents

Forensic Sci Int.
The occurrence of alcohol/drugs by toxicological examination of selected drivers in Hong Kong.
Cheng and Dao, 2017.
A Review of Risk Factors for Methamphetamine-Related Psychiatric Symptoms
Xiangwen Chang et al., 2018
Heart Lung Circ.
The Current Epidemiology of Injecting Drug Use-Associated Infective Endocarditis in Victoria, Australia in the Midst of Increasing Crystal Methamphetamine Use.
Wright et al., 2017
A significant proportion of people who inject drugs have switched to injecting synthetic cathinone in recent years.

Outbreaks of HIV and hepatitis C among people who inject drugs, partly due to the increased use of synthetic cathinone.
Methamphetamine users belong to the high-risk group for sexually transmitted infection in China.

Non-protected sex

Behavioural under-control
Methamphetamine induced arrhythmias
Heroin and Opioids
Stimulants and NPS
E-mail
gilberto.gerra@un.org

Twitter
@gilbertogerra