HKU and North District Hospital Identifies Long-term Ketamine Abuse Damages the Biliary System

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Speakers

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Drug Abuse in Hong Kong (2015)

- Reported drug abusers: 8,598 persons
  - Average age: 38 years
- Reported first-time drug abusers: 2,103 persons
  - Average age: 29 years
- Duration of abuse among “first-timers”: 5.8 years
- Age of starting drug abuse:
  - 20 years or below: 77%
  - 15 years or below: 35%

*Narcotics Division, Security Bureau*
*The Government of the HKSAR*
Drug Abuse in Hong Kong (2015)

Methamphetamine (Ice) 23.1%
Ketamine 39.0%
Sedatives
Cocaine
Cannabis
Cough Medication

All ages
Below 21 years

@Data not released

Narcotics Division, Security Bureau, The Government of the HKSAR
Besides Bladder Function

Ketamine Abuse also Affects the Biliary System

Research Article

Cholestasis and Autoimmune Diseases

Magnetic resonance cholangiogram patterns and clinical profiles of ketamine-related cholangiopathy in drug users

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Background & Aims: Recreational ketamine use has emerged as an important health and social issue worldwide. Although ketamine is associated with biliary tract damage, the clinical and radiological profiles of ketamine-related cholangiopathy have not been well described.

Methods: Chinese individuals who had used ketamine recreationally at least twice per month for six months in the previous two years via a territory-wide community network of charitable organizations tackling substance abuse were recruited. Magnetic resonance cholangiography (MRC) was performed, and the findings were interpreted independently by two radiologists, with the findings analyzed in association with clinical characteristics.

Results: Among the 343 ketamine users enrolled, 257 (74.9%) were recruited. The mean age and ketamine exposure duration were 28.7 (±5.8) and 10.5 (±3.7) years, respectively. A total of 159 (61.9%) had biliary tract abnormalities on MRC, categorized as diffuse extrahepatic dilatation (n = 73), fusiform extrahepatic dilatation (n = 64), and intrahepatic ductal changes (n = 22) without extrabiliary involvement. Serum alkaline phosphatase (ALP) level (odds ratio [OR] 1.0007; 95% CI 1.0002–1.0012), lack of concurrent recreational drug use (OR 1.59; 95% CI 1.11–2.21), and white emergency treatment for urinary symptoms (OR 1.50; 95% CI 1.02–2.23) had high predictive values for biliary abnormalities on MRC. Among male ketamine users, ALP level had an AUC of 0.849 in predicting biliary abnormalities, with an optimal level of 613 U/L having a positive predictive value of 85.4%. Cholangiographic abnormalities were reversible after ketamine abstinence, whereas decompensated cirrhosis and death were possible after prolonged exposure.

Conclusions: We identified distinctive MRC patterns in a large cohort of ketamine users. ALP level and lack of concurrent drug use predicted biliary abnormalities, which were reversible after abstinence. The study findings may aid public health efforts in combating the growing epidemic of ketamine abuse.

Lay summary: Recreational inhalation of ketamine is currently an important substance abuse issue worldwide, and can result in anomalies of the biliary system demonstrated by magnetic resonance imaging. Although prolonged exposure may lead to further clinical deterioration, such biliary system anomalies might be reversible after ketamine abstinence.

Clinical trial number: NCT02165840.

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Introduction

Recreational inhalation of ketamine is emerging as a major global social and health issue. Although ketamine, an N-methyl-D-aspartate receptor antagonist, has medical uses in anesthesia and chronic pain control, its highly addictive nature has led to a massive increase in recreational consumption worldwide. Because of the ease of production and low cost, the nonmedical use of ketamine is increasing especially in East and South-East Asia, with its lifetime prevalence in the general population ranging from 0.2% to 2.0%, comprising up to 20.7% of total recreational drugs users in these regions. The self-reported recreational use of ketamine in Western countries, including the UK, Australia, and Canada, is also increasing. From 2008 to 2014, law enforcement seizures of ketamine worldwide increased by more than threefold.

Long-term heavy use of ketamine is associated with different medical problems, including cognitive impairment and psychological issues. Damage to the urinary system is also well documented, with many ketamine users developing a large variety of urinary problems, ranging from lower urinary tract symptoms and bladder incontinence to nephrocalcinosis, renal impaction, and papillary necrosis. Urinary tract damage was common in a proportion of patients who used ketamine. Long-term ketamine use is also associated with deranged liver biochemistry and biliary tract anomalies.

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Research Method

- Supported by the Beat Drug Fund, HKSAR Government
- Participants recruited via territory-wide non-government organizations

Only a gross depiction of the catchment area of different organizations. Organizations have recruited participants outside the depicted areas.
Research Method

- Participants:
  - Recreational used ketamine at least twice per month for 6 months in past 2 years
  - Participants underwent clinical assessment, blood taking and MRI of the biliary system
  - MRI findings interpreted independently by two radiologists in research team
Study Results

- Recruited participants: 257 persons
- Average age: 28.7 years
- Average duration of ketamine abuse: 10.5 years

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concomitantly abused other drugs</td>
<td>31.5%</td>
</tr>
<tr>
<td>Emergency attendance for urinary symptoms</td>
<td>45.9%</td>
</tr>
<tr>
<td>Emergency attendance for abdominal pain</td>
<td>72.4%</td>
</tr>
<tr>
<td>Elevation of liver enzymes</td>
<td>60.3%</td>
</tr>
</tbody>
</table>
Study Results

159 participants (61.9%) had biliary anomalies on MRI

- Dilated common bile duct: 137 (53.3%)
- Abnormal intrahepatic ducts: 91 (35.4%)

If:
- ALP (a certain liver enzyme) elevated
- No concomitant drugs
- Urinary problems

Chances of biliary anomalies will increase.
Study Results

- Continued ketamine abuse
  - Liver cirrhosis
  - Liver failure

- Quitted ketamine
  - Biliary system normalized
Conclusion

• Many ketamine abusers develop biliary damage

Say No to Drugs!

• Ketamine abusers with high-risk of biliary damage should be referred for appropriate screening

• Educational promotion against drug abuse should emphasize:
  - Biliary damage will reverse after quitting ketamine
  - Longstanding ketamine abuse can lead to cirrhosis
Sharing of experience

An individual who has quitted ketamine
Question and Answer Session