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There's Something About Molly: The Under-Researched yet Popular Powder Form of Ecstasy in the United States

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Abstract

Molly has been the street name for powder or crystalline ecstasy (3,4-methylenedioxymethamphetamine [MDMA]) in the United States since at least 2008; however, few studies have examined Molly use or included Molly in the definition of ecstasy/MDMA. Prevalence of self-reported ecstasy use is being underreported on surveys due to the lack of inclusion of “Molly”, although Molly is often so adulterated with novel psychoactive substances such as synthetic cathinones (“bath salts”) that the name “Molly” may no longer adequately represent ecstasy/MDMA. The author recommends that Molly use and Molly purity be further studied to more adequately inform prevention and harm reduction.

Keywords

ecstasy; 3,4-methylenedioxymethamphetamine (MDMA); Molly

A Brief History of Ecstasy

Ecstasy, the street name for 3,4-methylenedioxymethamphetamine (MDMA), has been one of the most popular party drugs for over thirty years. Recreational use became prevalent among nightlife enthusiasts in the 1980s, but in 1985, the US Drug Enforcement Administration (DEA) placed ecstasy into Schedule I of the Controlled Substances Act, deeming the drug to be abusable and unsafe, with no legitimate medical value. The popularity of ecstasy, however, continued, and rates of use are believed to be highest in the late 1990s and early 2000s^{1,2} (e.g., with 12% of high school seniors and 15% of college students reporting lifetime use in 2001.¹

For decades, ecstasy typically came in pill form. Drugs similar to MDMA—such as 3,4-methylenedioxyamphetamine (MDA) and 3,4-methylenedioxy-N-ethyl-amphetamine (MDEA)—were commonly sold as ecstasy, or combined with MDMA in pills,^{3,4} although many of these MD_x drugs provide a high comparable to that from MDMA.⁵ During the 1980s and most of the 1990s, ecstasy pills tended to contain a high percentage of MDMA.³

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Most studies of purity of ecstasy have focused on pills, and over the last two decades many pills have been found to contain adulterants such as ephedrine,^{6,7} ketamine,^{3,4,7} amphetamine,⁴ methamphetamine,^{4,7,8} cocaine,⁴ 2C-B,^{7,9} dextromethorphan (DXM),^{4,6,8} and/or para-Methoxyamphetamine (PMA).⁷ Some of these adulterants (e.g., PMA) can be particularly deleterious when in ecstasy.¹⁰

Ecstasy purity was low in the US in the mid-1990s³ and purity plummeted in Europe around 2009,¹¹ but increased in 2010,^{8,11} while purity of powder and crystal ecstasy reportedly remained high in Europe (at 75–97%) in 2008–2013.¹¹ However, the presence of synthetic cathinones (“bath salts”) and other novel psychoactive substances (NPS) increased within both pills and powders from 2008–2013.¹¹ Spain in particular had a high prevalence of synthetic cathinones such as mephedrone and methylone detected in powder ecstasy.⁹ Despite extensive research in Europe, purity of ecstasy in the US over the last decade has not been formally researched.

Along Came Molly

Due to adulteration, throughout the 1990s some dealers in the US marketed pills which were said to be pure MDMA,¹² and by the early 2000s, MDMA powder sold in capsules increased in popularity. In fact, Molly has been used as a name for powder MDMA since at least the early 2000s.¹³ Molly—short for “molecular”—became the street name that now commonly refers to MDMA/ecstasy—or what is thought to be MDMA/ecstasy. Molly has become deeply embedded in US popular culture¹⁴ and there have also been many songs about use. Despite popularity of the drug, extensive media coverage, and numerous deaths and illnesses related to use in recent years^{16,16}—particularly at dance festivals,^{17,18} almost no research has been conducted to examine the epidemiology of Molly.

The two major annual national surveys of drug use in the US—Monitoring the Future (MTF)¹ and the National Survey of Drug Use and Health (NSDUH)²—only recently incorporated “Molly” into the definition of ecstasy/MDMA. NSDUH reportedly included “Molly” into their definition of ecstasy in 2015,¹⁹ and MTF added “Molly” in the definition in 2014.

A recent study compared self-reported prevalence among high school seniors in the MTF sample and found that lifetime prevalence was significantly higher when Molly was included in the definition of ecstasy.²⁰ Lifetime use was 8.0% when including Molly in the definition (compared to 5.5% without Molly in the definition); thus, prevalence on American surveys not including Molly in the definition of ecstasy use may be underestimating use. It is likely that many Molly users are unaware that Molly is (supposed to be) ecstasy.

Further, despite national surveys suggesting prevalence of ecstasy use has generally decreased since 2001,^{1,2} according to the Drug Abuse Warning Network (which stopped collecting data in 2011), ecstasy-related emergency department (ED) visits among adolescents in the US increased between 2005 and 2011, from 4460 to 10,176.²¹ Although more recent ED data are not publicly available, the number of reported poisonings involving “hallucinogenic amphetamines” (which are most commonly MDMA and MDMA-like

drugs) rose from 2057 (including 3 deaths) in 2009 to 2514 (including 14 deaths) in 2013.^{15,16} In addition, poisonings and deaths at large dance music festivals involving ecstasy use have also become more common in recent years.^{17,18} Therefore, despite national reports that prevalence of ecstasy use has decreased over the last 15 years,^{1,2} it appears that ecstasy-related poisonings and deaths have increased during the time of increasing popularity of Molly.

Is Molly Really MDMA?

Although Molly was named to represent pure MDMA, many Molly users are unaware that Molly is (supposed to be) ecstasy. While many volunteer “drug checkers” at organizations like DanceSafe who test ecstasy/Molly at dance parties suggest that many batches of Molly they have tested are adulterated with NPS such as “bath salts” (as was reported in *Rolling Stone* magazine),²² there has not been any formal published research on the tested purity of ecstasy/Molly in the US in the last decade. A recent study collected hair samples of nightclub/festival attendees and found that among lifetime users of ecstasy/Molly who did not report use of “bath salts”, four out of ten tested positive for “bath salts” or other NPS.²³ Of these hair samples, 38% contained butylone, 9% contained methylone, 3% contained alpha-PVP (“Flakka”), 3% contained 4-FA, and 3% contained 5/6-APB. Of the larger sample assessed in this study, half (50%) reported suspecting or finding out that their ecstasy/Molly had ever contained a drug other than MDMA.²⁴

Recommendations for Education and Harm Reduction

First and foremost, teens need to be educated that Molly is—or is supposed to be—ecstasy/MDMA and that Molly is not a safe new drug. Users and potential users also need to be educated about the risks of using Molly (and NPS which may be present in Molly). Since prevention is not always successful, harm reduction education is needed for those who use. General ecstasy education should focus on common adverse effects (e.g., dehydration, overheating) associated with MDMA use (regardless of drug form) and how to prevent such effects. Harm reduction education specific to powder ecstasy (Molly) is also needed. For example, while powder ecstasy may allow users to better titrate small doses (as compared to pills), like any powder drug, users may not measure doses, take larger doses than intended, and/or forget when they last dosed (and then re-dose), and thus “overdose”. Likewise, users need to be informed that dipping their fingers into bags of Molly (often after licking their fingers—a common practice) may increase the chances of spreading or contracting contagions.

Drug testing services such as DanceSafe have volunteers who test drugs for patrons outside of dance events. These reagent tests are also sold (online) by such organizations. While these tests are by no means completely accurate,²⁵ they can help determine whether an MDx drug (MDMA or a similar drug) is present in Molly, or whether other NPS such as synthetic cathinones are present. This is important because NPS are understudied and have potential to be even more dangerous than MDMA.

Recommendations for Research

First, researchers need to ensure they are appropriately querying Molly use. Questions about Molly use should be added to surveys that ask about drug use as many surveys do not ask about ecstasy/MDMA/Molly. Molly use can be assessed via its own question(s) or Molly can be listed as a street name for ecstasy/MDMA.

Second, more epidemiology research is needed. It is important to accurately estimate local and national prevalence of Molly use, as well as correlates of use, in order to inform appropriate public health response. Further research on poisonings and hospitalizations related to Molly use is needed, and examination and tracking of Molly-related poisonings and deaths that occur at dance festivals are needed to further inform prevention and harm reduction. Research is also needed to examine the epidemiology of drug form (e.g., powder vs. pill), route of administration (e.g., oral vs. nasal), and polydrug use (e.g., Molly co-used with alcohol), and how these factors relate to adverse outcomes.

Finally, research testing drug contents (e.g., via UHPLC-MS-MS) is needed to determine drug purity and whether NPS are present. Such research would help determine what drug(s) individuals are actually using, especially if a powder said to be Molly does not contain MDMA. This would allow us to document what drugs individuals are actually using and results can inform prevention and harm reduction. However, it is difficult for researchers to acquire approval (e.g., from the DEA, funding sources, institutional review boards) to directly test Molly contents as MDMA is a Schedule I drug. Biological specimen testing (e.g., of blood, urine, or hair) can also be conducted and it allows researchers to determine the contents of the Molly individuals have used.²³ Drug and specimen testing can also help determine which specific adverse outcomes are associated with which drug(s) contained in the Molly that was used. Specimen testing has been used to examine what drugs were used among those who have been poisoned or died after Molly consumption,¹⁷ but such testing needs to be conducted more often to inform the scientific community and the public about the potential dangers associated with Molly use.

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