



### **K34 Use of MDA (the “Love Drug”) and Methamphetamine in Toronto by Unsuspecting Users of Ecstasy (MDMA)**

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Attendees will learn that a variety of amphetamine derivatives are now being marketed to ecstasy users in Canada who request only ecstasy (MDMA) from the drug supplier. More importantly, discussion at the presentation will offer explanations for the reasons why illicit drug manufacturers are including MDA and methamphetamine in ecstasy tablets despite the absence of any specific demand for these drugs.

This presentation will alert the forensic community and the general public to an emerging trend of illicit drug use in Canada and stimulate discussion, which will attempt to provide the basis for this change in recreational drug marketing.

Background and specific aim. MDA (3,4-methylenedioxyamphetamine), previously known as the “love drug”, is a synthetic amphetamine derivative, which has been used illicitly in part for its reported ability to induce a state of heightened empathy and introspection. Although MDA was a commonly used drug thirty years ago, the present drug of choice in the “entactogen” class of drugs is the related compound “ecstasy” (3,4-methylenedioxymethamphetamine, MDMA), which can be metabolized to MDA in the human. Most users of the drug “ecstasy” expect that they are obtaining MDMA.

As death has occurred following ingestion of MDA and MDMA, it is important to establish the extent of use of either drug by the public as well as emerging trends of drug use. Typically, marketing of an illicit drug is determined to a large extent by true demand. However, demand can also be influenced by the surreptitious inclusion by the clandestine laboratory of additional substances in the drug formulation, which enhance the desired effects of the drug “cocktail.”

The purpose of our pilot investigation was to establish the identity of the drug(s), which are marketed and used in the Toronto area as ecstasy. For this purpose, we conducted forensic drug hair analysis of subjects who requested from their drug supplier tablets, which contain only ecstasy (MDMA). Our hair data, together with local drug seizure findings, indicate that despite an absence of any specific demand, the drugs MDA and methamphetamine are now being marketed to unsuspecting ecstasy users.

Methods: Levels of psychostimulants (ecstasy, MDA, MDEA, PMA, PMMA, methamphetamine, amphetamine, cocaine, and metabolites), ketamine, PCP, and opiates (heroin, morphine and metabolites, codeine) were measured by GC-MS in consecutive one half-inch segments of scalp hair taken from the back of the head of 21 drug users who reported that ecstasy (MDMA) was the only drug requested over the period of time corresponding approximately to the extent of growth of scalp hair (one month/one half-inch of hair) with the exception, for some of the subjects, of use of cannabis and “mushrooms.”

Major Findings; MDMA was detected in one or more one-half inch hair segments of 19 of the 21 drug users, providing good agreement between the results of a structured interview and the forensic drug analysis.

MDA could be detected in most of the hair samples, which tested positive for MDMA. In urine, autopsied brain, and hair of ecstasy users, the ratio of MDA to MDMA is approximately 0.20 or lower. Although no precise cut-off ratio has yet been established, high ratios MDA:MDMA (e.g., >1.00) are highly suggestive of use of both MDA and MDMA. Thus, of the 19 subjects testing positive for MDMA, 12 subjects had MDMA levels in hair much greater than those of MDA; or MDMA in the absence of any MDA, suggesting selective use of MDMA; whereas 7 subjects had levels of MDA equal to or much greater than those of MDMA, indicating use of both MDMA and MDA. One female subject, in particular, tested positive for MDA in a total of 23 of 26 examined one half-inch hair segments (representing about two years of hair growth), with relatively low levels of MDMA in only two segments, indicating primary or exclusive use of MDA for this extensive period of time.

Hair analysis also revealed that amphetamine/methamphetamine was detected in a total of 8 of the 21 subjects.

Analysis of contents of seized suspected ecstasy tablets in the southern Ontario area confirmed presence of MDA and methamphetamine alone or in combination with MDMA. Estimates are that about half the tablets submitted for analysis in Ontario as ecstasy contain only MDMA. The remainder contain one, a few, or several of the following components: MDMA, MDA, MDEA, methamphetamine, ketamine, caffeine, ephedrine, pseudoephedrine, and/or phencyclidine. Eleven clandestine laboratories producing either MDMA or MDA were seized in southern Ontario during the time period January 2000 to June 2003. Of those eleven, three produced only MDMA; three only MDA; three MDMA, MDA, and methamphetamine; and two MDMA and methamphetamine.

Conclusions: Ecstasy users need to be advised that MDA and methamphetamine are being marketed as ecstasy despite the absence of any specific demand for these amphetamine derivatives. Possible reasons



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for the clandestine laboratory operators to include MDA and/or methamphetamine in their “ecstasy” preparations are related to either the syntheses involved or the effect that the added (substituted) drugs will have on the user.

Conversations with two MDMA / MDA clandestine lab operators indicated that they perceived that the preparation of MDA is simpler than that of MDMA. In addition, they believed that the chemicals needed to synthesize MDA were easier to obtain and were not monitored (by the authorities) as closely as those for the synthesis of MDMA. While neither of these statements is necessarily true, it is the underground chemist’s perception that is important. It is also possible that MDA is included in some ecstasy preparations because of its reputed higher potency and longer half-life. Methamphetamine might be included in ecstasy tablets to provide enhanced stimulant effects and to maintain and increase market size because of the addiction potential of the drug.

Finally, our observations confirm that studies designed to determine whether ecstasy alone might cause brain damage need to confirm by forensic drug testing whether ecstasy was the only illicit drug used by the subject.

The opinions and assertions contained herein are the private views of the authors and are not to be construed as official or as reflecting views of the United States Departments of Army or Defense, or of Health Canada.

### **Ecstasy, MDA, Methamphetamine**