K5 Recent Paramethoxymethamphetamine (PMMA) Deaths in Taiwan

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After attending this presentation, attendees will learn about: 1) the action of PMMA; 2) a sensitive GC/MS method for the analysis of PMMA; and 3) the concentration of PMA and PMMA in postmortem specimens.

Trafficking of PMA and PMMA tablets are found in Taiwan from December 2005 to March 2006. Five deaths caused by acute toxicity of PMA and PMMA in April have posed a threat to the society in Taiwan because people are unaware that PMMA in combination with PMA are sold as Ecstasy. PMA is classified as Schedule II controlled drug but PMMA has not been classified as a controlled substance in Taiwan. This presentation will impact the forensic community and/or humanity by presenting the need to bring PMMA as Scheduled II controlled drugs and also to impose criminal penalties through legislation.

Paramethoxyamphetamine (PMA) and paramethoxymetham- phetamine (PMMA) are methoxylated phenylethylamine derivatives that have been banned in Taiwan since December 2005. Case history and pathological and toxicological findings of eight recent PMMA fatalities were investigated. All specimens from these cases were initially identified by AxSYM fluorescence polarization immunoassay screening test for amphetamines with a 300 ng/mL cutoff. Specimens screened positive were confirmed and quantitated by gas chromatography-mass spectrometry. The mean age of these PMMA-related fatalities was 18.9 ± 4.4 years ranging from 14–25. Seven (87.5%) of these eight cases were men. The mean, standard deviation, and range of PMA found in the heart blood collected from these eight cases were 0.213, 0.144, and 0.079–0.489 µg/mL; the corresponding data for PMMA were 4.312, 4.806, and 1.208–15.824 µg/mL, respectively. Other drugs, such as MDA, MDMA, ketamine, norketamine, hydroxymidazolam, methamphetamine, and pentobarbital, were also found in these cases. This paper describes five cases of fatal overdose from PMMA ingestion that occurred in April 2006 in Taiwan. These cases reflect the well- known fact that street drugs offered as ecstasy pills do not necessarily contain MDMA, but frequently differ in composition even if they have the same logo. Users of these pills therefore always take the risk of consuming pills with dangerous life-threatening ingredients.

Forensic Toxicology, PMMA Deaths, Drug of Abuse

Table I. Postmortem Distribution of PMA and PMMA (µg/mL) Found in Specimens Collected from Eight Fatal Cases in Taiwan.

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Table I. Postmortem Distribution of PMA and PMMA (μg/mL) Found in Specimens Collected from Eight Fatal Cases in Taiwan.

Case	Age	Sex	Drug Ratio	Heart Blood	Urine	Other Drugs (Blood, μg/mL)	Cause of Death	Manner of Death
1	14	M	PMA PMMA PMA/PMMA	0.145 3.017 0.048	6.263 157.51 0.040	Ketamine, 0.018 Norketamine, 0.017	PMMA intoxication	Accidental
2	15	M	PMA PMMA PMA/PMMA	0.196 1.554 0.126	1.808 7.646 0.237	ND[a]	PMMA intoxication	Accidental
3	18	F	PMA PMMA PMA/PMMA	0.367 15.824 0.023	—[a] — NA[a]	Ketamine, 1.210 Norketamine, 0.558 Methamphetamine, 0.139	PMMA intoxication	Suicide
4	19	M	PMA PMMA PMA/PMMA	0.489 4.014 0.122	— — NA	Pentobarbital, 0.283	PMMA intoxication	Accidental
5	25	M	PMA PMMA PMA/PMMA	0.122 1.208 0.101	0.379 11.857 0.032	MDMA, 0.199 Ketamine, 0.154 Norketamine, 0.177	PMMA intoxication	Accidental
6	14	M	PMA PMMA PMA/PMMA	0.205 2.193 0.093	5.964 88.706 0.067	Methamphetamine, 0.109 MDA, 0.134 MDMA, 14.637 Ketamine, 0.199 Norketamine, 0.326	Multiple-drug intoxication	Accidental
7	22	M	PMA PMMA PMA/PMMA	0.097 1.969 0.049	0.263 14.208 0.019	Ketamine, 0.041	PMMA intoxication	Accidental
8	24	M	PMA PMMA PMA/PMMA	0.079 4.718 0.017	— — NA	MDA, 0.172 MDMA, 4.322	Multiple-drug intoxication	Accidental

[a] ND: Not detected; NA: Not applicable; —: Sample (or information) not available.

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