A trip to the unknown: 2,5-Dimethoxy-4-chloroamphetamine (DOC) sold as LSD: study on samples delivered by users asking for substance analysis

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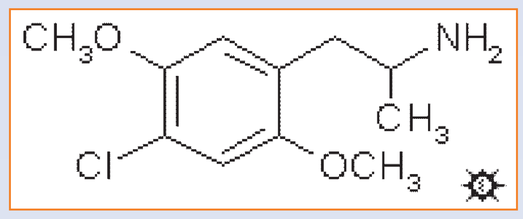
Introduction

New Psychoactive Substances (NPS) appear to be increasing in popularity because they mimic the effect of traditional drugs and they are sold freely through internet (1). NPS usage is difficult to monitor due to the absence of systematic screening in common drug checking controls (2). The presence of this new substances has been detected through surveys, questionnaires, studies in drug samples, studies in biological fluids and case reports. DOC (2,5-dimethoxy-4-chloroamphetamine) is a phenethylamine with agonist activity in 5-HT2a and 5HT2c receptors, producing effects comparable to LSD (5). Compared to LSD, DOC has a longer onset time, that typically raises re-dose risk when the user don't know what is consuming. It also seems that DOC could lower convulsion threshold and lead to fatal outcomes (3,4). Reviewing literature 7 articles were found, 3 of them case reports, one reporting DOC as the most probable cause of death (2,3,4,5,7).



Objective

The main goal of this study is to determine DOC presence and characteristics from the samples analyzed by spanish harm-reduction non-governamental organization between the years 2009 and february 2015.

Materials and methods

- All samples presented to Energy Control (EC) were analyzed. EC is a spanish harm-reduction non governmental organization that offers to users the possibility of analyzing the substances they intend to consume.
- Samples in which DOC was detected using Gas Chromatography-Mass Spectrometry were selected for study.

Results

- From the 18222 samples analysed during the period of study DOC was detected in 41 (fig. 1). Only 16 (39%) of those were delivered between 2009 and 2013 (fig. 2).
- From these 41 samples containing DOC, 23 were handled as other substances, mainly LSD (fig. 3). This represents a 4,36% of the samples delivered as LSD.
- The samples containing DOC also contained dimethoxyamphetamine, DOB, synthesis byproducts, unknown substances, MDMA, DOM and octadecenoic acid (fig. 4).
- 7 articles were found in the literature, 3 of them case reports and one reported DOC as the most probable cause of death.

Fig. 1: Distribution of samples

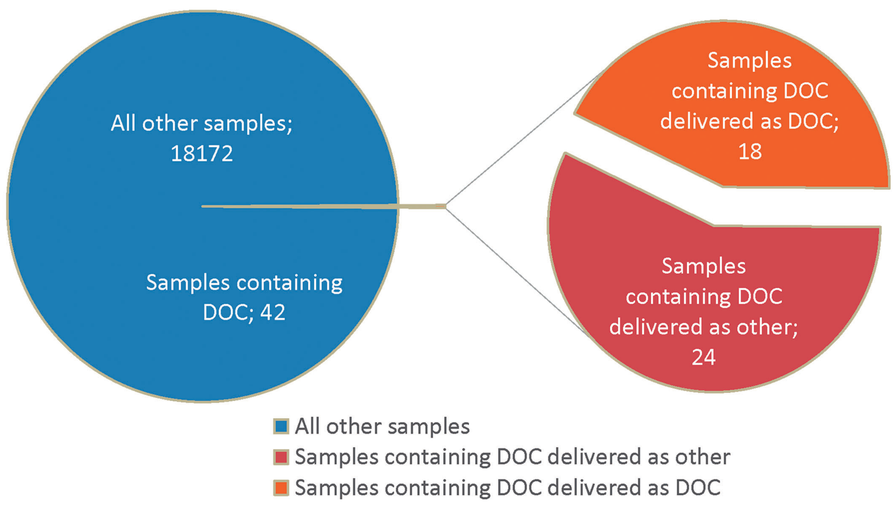


Fig. 2: Number of samples containing DOC delivered per year

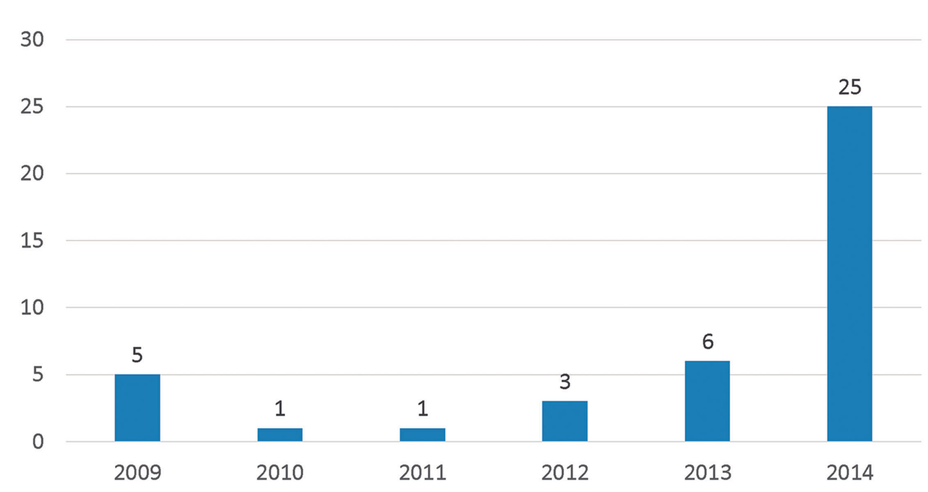


Fig. 3: Samples containing DOC delivered as other substances

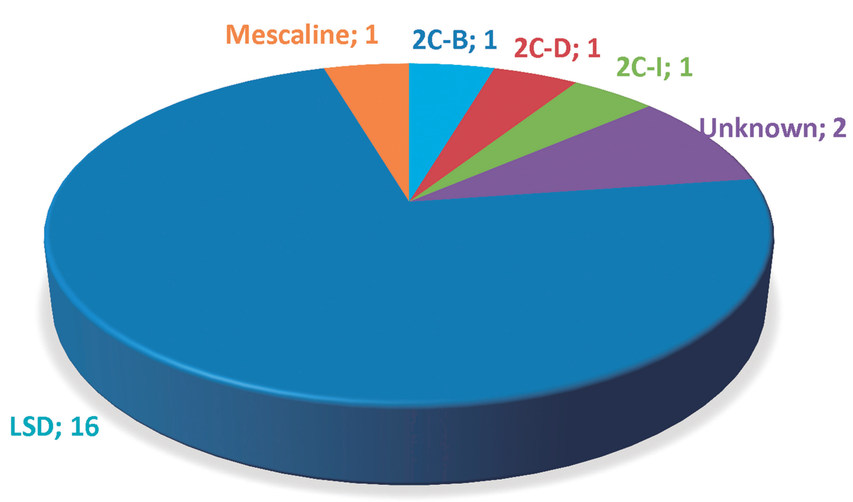
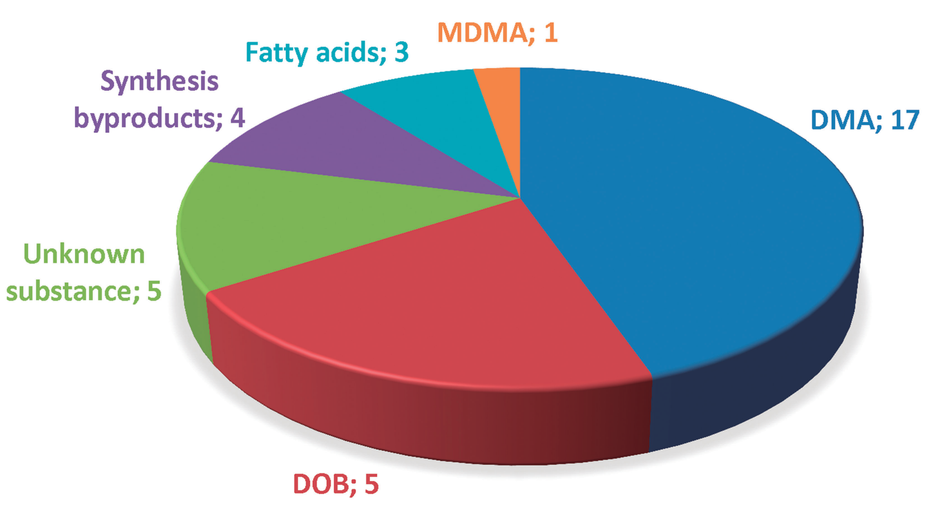


Fig. 4: Number of samples containing DOC that contained other substances



Conclusion

- Results show a recent increase in DOC analysis that could translate an increase of its consumption. There is also high proportion of DOC sold as LSD, with high potential risk for overdosing, convulsion and even death.
- The presence of DMA in the samples containing DOC is probably a synthesis byproduct, as it is used in the two synthesis routes that can be found in the literature. Its presence is probably not relevant from a clinical viewpoint, as it is mostly inactive under 80mg. DOB has similar dosage, effects and duration to DOC, and is a controlled substance. The presence of DOB in most of the samples that contained also DOC is puzzling, and warrants further research.
- Main limitations of this study could be selection bias of samples delivered and the small number of samples containing DOC, that could over-represent arbitrary variations.
- When a patient presents to an Emergency Department with agitation, seizures or hallucinations after ingesting a blotter, clinicians should consider possible involvement of DOC, because of its potentially life-threatening complications, especially if toxicological analysis is negative for LSD.

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