

Quantification of LSD and 2-oxo-3-hydroxy LSD in serum and urine samples of five acute emergency toxicological cases

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Aims: The aim of the present study was to quantify LSD and 2-oxo-3-hydroxy LSD in serum and urine samples of patients with a suspected acute LSD intoxication. **Methods:** Serum and urine samples were analysed on an ion-trap LC-MS/MS instrument coupled to a turbulent-flow extraction system. **Results:** In four emergency cases an acute LSD intoxication could be confirmed. None of the above cases was found positive for an accidental consumption of other designer drugs instead of LSD. **Conclusion:** The new LC-MS method was applied in five toxicology cases where consumption of LSD could be confirmed four times in serum and once in urine. With a short method run and minimum sample preparation, results will be more quickly available so that a fast diagnosis is possible.

1. Introduction

The aim of the present study was to quantify LSD and 2-oxo-3-hydroxy LSD in serum and urine samples of patients with a suspected acute LSD intoxication. A fast and reliable turbo-flow LC-MS method was developed without need of time consuming extraction steps to provide fast results for the emergency department in cases with suspected LSD intoxication¹.

2. Material and Methods

From October 2013 to December 2014 cases with a suspected acute LSD intoxication were collected from the emergency department of the University Hospital Basel. Serum and urine samples were analyzed on an ion-trap LC-MS instrument (LTQ XL, Thermo Scientific) coupled to a turbulent-flow extraction system (Transcend TLX1, Thermo Scientific). An additional qualitative screening method for multiple designer drugs was used to exclude accidental consumption of designer drugs recently found on LSD blots in Switzerland.

3. Results and Discussion

Case 1 was 17-year old girl brought in with acute confusion and loss of sense of time and orientation. She admitted consumption of one blot and two sugar cubes containing LSD. She was further under treatment with trazodone. As expected, serum levels were found extremely high with 14.7 µg/L. Even O-H-LSD was quantifiable in serum and showed a concentration of 0.99 µg/L. An additional drug screening performed in serum found her positive for TCA and THC.

The second patient was a 17-year-old male with symptoms of inner restlessness, dyspnea and thoracic pressure reported ingestion of approximately 250µg of LSD at 8 p.m. Before the LSD intake he had smoked a joint. The side effects did set on 2 hours post-consumption.

Serum levels showed a LSD concentration of 1.80 µg/L at 11 p.m. O-H-LSD was below the LLOQ of 0.1 µg/L.

In the third case an aggressive and uncooperative 21-year-old male was brought to the emergency department by the police. He had different cuts in his face after running into a glass wall. No anamnesis or further information about the drug consumption was available. An additional drug screening performed in serum found him positive for amphetamine, cannabis and cocaine. LSD concentration in serum was 6.1 µg/L and O-H-LSD 0.45 µg/L.

The fourth patient, a 45-year-old male, presented himself with agitation, confusion and disorientation after returning from a two day party trip. During the last 48h he had consumed unknown doses of LSD, cocaine and cannabis. He reported himself as a experienced drug user, but somehow he lost his self-control on this trip. The drug screening performed in serum confirmed cannabis, cocaine and LSD (4.1 µg/L). No O-H-LSD was found in serum.

4. Conclusions

In all four emergency cases an acute LSD intoxication could be confirmed. Serum levels of LSD were 1.8 µg/L, 4.1 µg/L, 6.1 µg/L and 14.7 µg/L, respectively. In the two patients with the highest LSD serum concentrations, O-H-LSD could be quantified in serum with a concentration of 0.45 µg/L and 0.99 µg/L, respectively. From a fifth case, only urine samples were available and showed a LSD concentration of 1.3 µg/L and an O-H-LSD concentration of 9.7 µg/L. None of the above cases was found positive for an accidental consumption of other designer drugs instead of LSD.

5. References

- [1] Dolder PC, Liechti ME, Rentsch KM. Development and validation of a rapid turboflow LC-MS/MS method for the quantification of LSD and 2-oxo-3-hydroxy-LSD in serum and urine samples of emergency toxicological cases. *Anal Bioanal Chem* 2015;407:1577-1584.