Fast analytical methods to profile three seized ketamine samples

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AIMS

Full spectroscopic profiling (1H NMR, 13C NMR, FT-IR, UV, ESI-MS, and [α]D20) of seized samples of ketamine were carried out and compared demonstrating that each of the three samples is of high purity (>98.7%).

INTRODUCTION

Ketamine BP is abused for its dissociative effects. In the last few years there has been a dramatic increase in the sale of “legal highs” [1] and (illegally) prescription only medicines. For evidential and intelligence purposes, drug profiling studies can be used to link between different seizures [2]. The presence or absence of specific organic impurities in synthetic drugs can be valuable tools to link between different seizures from the same source [3].

MATERIALS AND METHODS

Materials

Three different seized ketamine (KT) samples (KT-1, 2, and 3) were obtained from the Drug Expert Action Team (DEAT), Avon and Somerset Constabulary, UK and analyzed as received. All other chemicals and reagents were purchased from Sigma-Aldrich, UK.

Apparatus

Spectroscopic measurements were recorded on a Perkin Elmer 65-FT-IR Spectrometer, a Bruker NMR (400 MHz), a Bruker Daltonics “micrOTOF” electrospray ionization mass spectrometer (ESI-MS), and optical rotation values were determined on an ADP-220 polarimeter (Bellingham and Stanley, Tunbridge Wells, UK).

RESULTS AND DISCUSSION

An X-ray crystal structure was obtained and shows a racemic mixture of the title compound (Fig. 2). Equal chemical structures for samples (KT-1, 2, 3) were determined on an ADP-220 polarimeter (Bellingham and Stanley, Tunbridge Wells, UK).

CONCLUSIONS

The results confirm that these three separate samples of ketamine, seized by the police, are equivalent and of high purity (>98.7%). The samples have not been adulterated (cut) with other materials including inorganic (CDCl3 insoluble) material. Whilst these three ketamine samples are all racemic, this is mostly how ketamine BP is supplied. However, pharmacokinetic properties of (R)-(S)-ketamine have been proved to be significantly different. They have been reported to have different metabolic profiles and receptor binding affinities, with (S)-ketamine being a more potent analgesic agent [4,5]. The results show the potential of this method to discriminate between ketamine samples and any adulterants.

REFERENCES

1) Vardakou, I.; Pistos, C.; Spiliopoulou, Ch. Drugs for youth via Internet and the example of mephedrone. Toxicol. Lett. 2011, 201, 191-195.

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