SUICIDE BY SELF-ADMINISTRATION OF PETHIDINE, PROPOFOL AND ANXIOLYTICS : A CASE REPORT

Paula Proença[1*], Alice Castanheira[1], Fernando Castanheira[1], Carla Monteiro[1], Beatriz Silva[1], João Franco[1], Francisco Corte-Real[1,2]

[1] National Institute of Legal Medicine and Forensic Sciences, Portugal [2] Faculty of Medicine, University of Coimbra, Portugal
*Corresponding author: *paula.i.proenca@inmlcf.mj.pt*

INTRODUTION

Recreational use of anesthetic and sedative agents in health care practitioners is becoming an increasing problem due to its easy availability and, therefore, they become vulnerable to misusing or abusing of these drugs. Propofol must always be considered as a possible cause of death if there is medical drug paraphernalia at the death scene, and in particular, if the deceased is a health care professional.

CASE REPORT

The authors present a fatal case involving a 50-year-old man, nurse, found dead in a hospital room, with intravenous access devices in the forearm that were attached to two packages of saline solutions. Some empty packages were close to the victim. In addition to biological samples, a white viscous fluid found at the death scene was send to analysis. The expert's investigation at the scene indicated possible propofol poisoning.

RESULTS AND DISCUSSION

Sample preparation

Blood (100 µL) with IS (20 µL clomipramine-d3, 1 µg/mL) and 100 µL of H_2O:MeOH (1:1) were extracted by using a protein precipitation procedure with 900 µL of ACN (-20 °C). After vortex, the samples were centrifuged for 10 min in a refrigerated centrifuge at 5 °C and 14.000 rpm. 10 µL was injected into the LC-MS/MS system.

LC conditions: Equipment: SCIEX Exion LC

The separation was performed in an Acquity UPLC® HSS T_3 (100x2.1 mm, 1.8 µm) column using a gradient elution with 2 mM ammonium formate (formic acid 0.1%) (A) and methanol with 2 mM ammonium fluoride (B) at a flow rate of 0.4 mL/min and a run time of 10 min. Column and sample temperature at 45 °C and 15 °C.

Figure 1. Chromatograms of propofol in blood samples in MRM positive and negative mode.

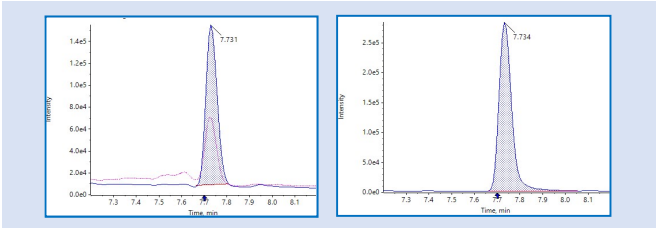
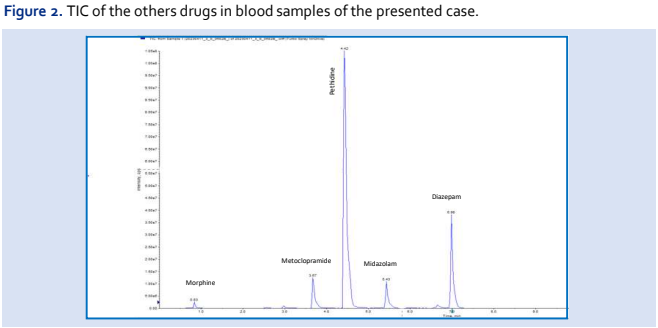


Figure 2. TIC of the others drugs in blood samples of the presented case.



MS/MS conditions: Equipment: SCIEX QTRAP 6500+

Table I. Retention time and MRM parameters of propofol (positive and negative mode).

Substance	RT(min)	Q1 *m/z*	Q3 *m/z*	DP (V)	EP (V)	CE (V)	CXP (V)
Propofol MRM +	7.70	178.9	137.1/ 95,0	11/ 11	10/ 10	13/ 21	6/ 10
Propofol MRM -	7.70	176.9	176.9	-70	-10	-25	- 10
Clomipramine-d_3	6.66	318.1	89.0/ 61.0	96/ 96	10/ 10	23/ 65	10/ 8

Data Acquisition

The Analyst 1.7.2 software controlled the LC–MS-MS system, and Sciex Q 2.2 was used to process the data.

Figure 3. Calibration curve of propofol from 1 – 40 µg/mL.

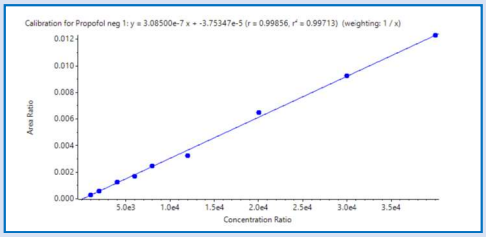


Table II. Toxicological results of biological samples of the presented case.

Substance	Peripheral blood	Heart blood	Urine	Stomach content	White viscous fluid
Diazepam	5182 ng/mL	Present	Present	Present	not detected
Metoclopramide	356 ng/mL	Present	not detected	Present	not detected
Midazolam	1473 ng/mL	Present	not detected	Present	not detected
Morphine	<25 ng/mL				
Pethidine	8622 ng/mL	Present	Present	Present	Present
Propofol	**33500 ng/mL**	**113313 ng/mL**	not detected	**Present**	**Present**
Ethanol	0.18 g/L				

Proficiency Test TAB

The method was applied in the proficiency tests TAB 1/24 -Toxicological Analysis for Diagnostics of Brain Death (*Z*-score ≤3).

CONCLUSIONS

The development of the method for confirmation and quantification of the anesthetic propofol was crucial given the suspicion of poisoning by this substance. However, laboratory analysis has also revealed the simultaneous presence of an opioid analgesic agent (pethidine) and anxiolytics in high blood concentrations. These findings have allowed to identify a case where several drugs were abused and whose synergy of effects and intoxication, that were not considered at first, were lately found to have contributed to the medico-legal etiology of suicide.