Fatal Intoxication Involving the Novel Synthetic Opioids SR-17018 and Methiodone: A Case Report

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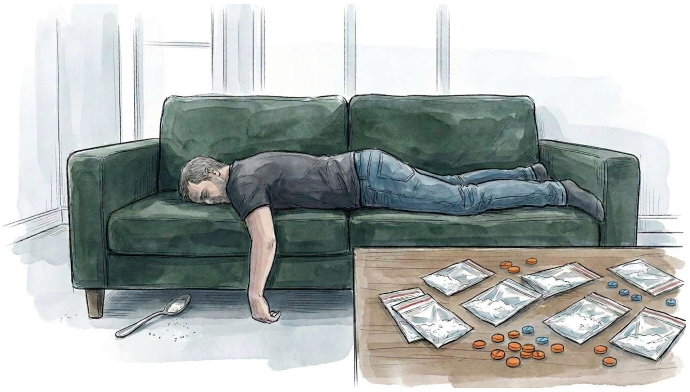
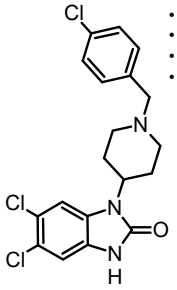
The Case: Illustration of the crime scene

The 63-year old man found dead in his appartment. The Illustration was created by AI based on the description of the case.



SR-17018

5,6-dichloro-desmethylchlorphine
(IUPAC: 5,6-Dichlor-1-[1-[(4-chlorophenyl)methyl]-4-piperidinyl]-1,3-dihydro-2H-benzimidazol-2-on))



- Novel Synthetic opioid (NSO)
- Potential risks and variable potency levels
- Belongs to the newly emerging group of "orphine" opioids
- Limited toxicity data
- No established clinical use
- Structurally related to brorphine and cychlorphine[2]

Opioid intoxication: Symptoms
- Respiratory depression
- Impaired consciousness
- Miosis
- Cyanosis

Results & Discussion

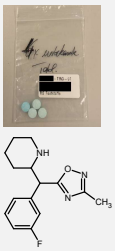
Matrix	SR-17018 [ng/mL]	5,6-Dichloro nororphine (Metabolite of SR-17018) [ng/mL]	Methiodone [ng/mL]
Femoral blood	15	14	560
Heart blood	5	13	510
Muscle	17*	11*	1,200*
Postmortem urine	22	> 200	1,200
Liver	40*	61*	1,500*
Bile	650	56	4,500
Kidney	10*	86*	> 2,000*
Gastric content	17	20	1,500
Brain	57	11*	550*

***[ng/g]** All values are approximate as no standard addition could be performed.

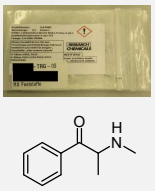
Other findings in femoral blood and urine were cychlorphine (0.1 ng/mL), piptapentadol and 3,4-EtMC (3,4-ethylene-methcathinone) (<1 ng/mL). Additionally, diphenhydramine, fluoxetine and norfluoxetine could be detected in femoral blood in therapeutic concentrations. Blood alcohol was negative.

Powders and Tablets

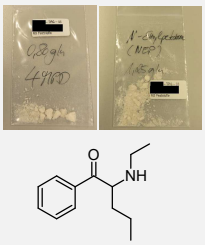
3-FPO



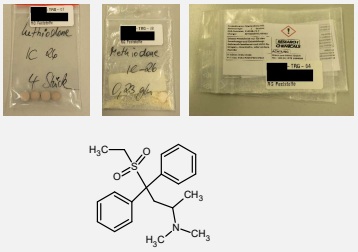
Methcathinone



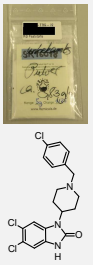
N-Ethylpentedrone



Methiodone



SR-17018



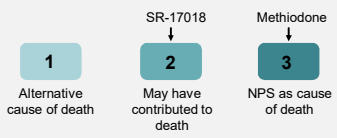
Discussion:

- Death due to opioid intoxication with unspecific signs of intoxication (brain edema, hypoxia, hemorrhagic pulmonary edema) during autopsy.
- Unfortunately, postmortem redistribution (PMR) of SR-17018 could not be assessed due to the analytical limitations. Opiates often exhibit PMR due to their lipophilicity. Therefore PMR can not be evaluated for SR-17018.
- Furthermore, the substances 3-FPO, methcathinone and N-ethylpentedrone, which were found at the crime scene, were not detected in blood, urine and in the tissue samples.

Analytical Limitations

- Variable peak intensity was observed for repeated sample injections in the analysis of SR-17018
- Unknown stability of SR-17018

Toxicological Significance Score (TSS)[1]



Potency of SR-17018

- *In vitro* assay data established SR-17018 as MOR (μ-opioid receptor) agonist based on the maximal receptor activation of 110 % relative to fentanyl.
- The *in vitro* potency assessed as the EC_{50} value of a concentration-response curve was determined to be 227 nM.
- Compared to fentanyl, the potency of SR-17018 is approximately 10-times lower.

Methods

- Systematic toxicological analysis: Screening for drugs of abuse including ethanol was performed using standard methods.
- Quantification was performed using an external matrix calibration.
- Receptor activation was evaluated using an HTRF®-Assay (homogenous time resolved fluorescence) measuring G protein signaling as increase in fluorescence upon MOR activation.
- Powder- and tablet samples were analyzed using GC-MS.

Conclusion

The findings underline the importance of including novel synthetic opioids such as SR-17018 and methiodone in comprehensive postmortem toxicological analyses.

References

[1]Elliott, S., Sedefov, R. & Evans-Brown, M. Assessing the toxicological significance of new psychoactive substances in fatalities. Drug Test. Anal. 10, 120–126 (2018).
[2]Man, N., Sutherland, R., Bruno, R., Barratt, M. & Peacock, A. Availability of Orphine Analogues for Purchase in Australia and Internationally via Cryptomarkets, June 2021 - January 2026. Drug Trends Bulletin Series http://hdl.handle.net/1959.4/107650 (2026) doi:10.26190/UNSWORKS/32226.
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