

Aim: Describe the significance of quetiapine as a toxic adulterating substance in the illicit drug supply and its appearance with illicit drugs in toxicological casework.

Background

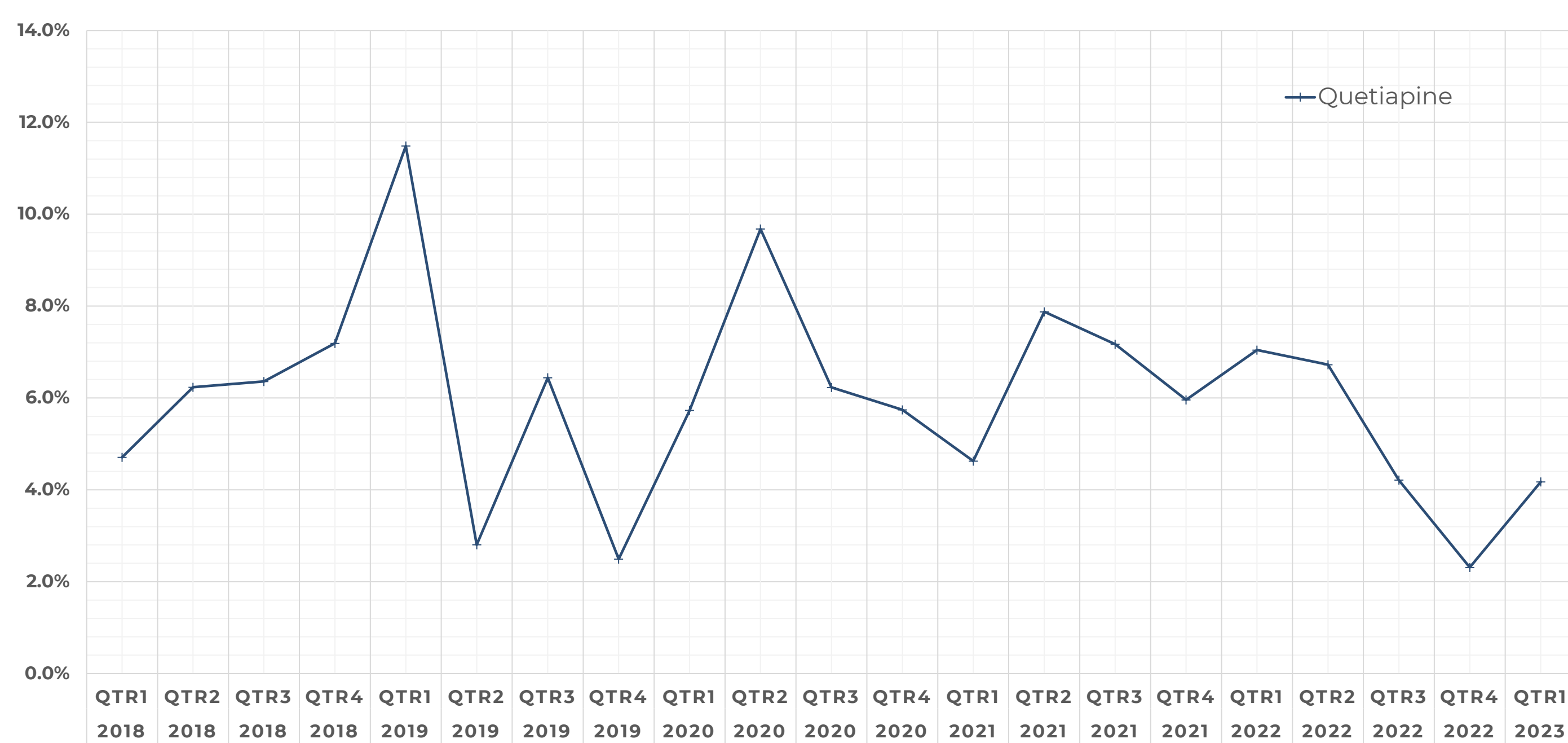
- Quetiapine (Seroquel®) is an atypical antipsychotic medication used in the treatment of schizophrenia, and bipolar disorder.
- Quetiapine causes sedation and sleepiness and has extensive off-label use as a sleep aid, although it is not approved for this application.
- It has a broad side effect profile which includes orthostatic hypotension, seizures, priapism, high blood sugar, tardive dyskinesia, and neuroleptic malignant syndrome (NMS).
- Quetiapine has been identified as a toxic adulterating substance in the illicit drug supply being used to adulterate heroin, cocaine, and fentanyl in seized drug samples collected from West Virginia, Indiana, and Ohio.

Methods

- Data from seized drug analysis from CFSRE for the incidence of adulterants in toxicological samples and seized drug samples was collected.
- Postmortem casework from NMS Labs was evaluated for the presence and concentration of quetiapine in postmortem toxicology casework was collected along with co-positivity of quetiapine with other licit and illicit drugs.
- Positivity for quetiapine in umbilical cord tissue for neonates with opioid positivity were evaluated.

Results

Quetiapine Positivity in Toxicological Samples analyzed at CFSRE



Other Drug Co-Positivity in NMS Labs Postmortem Quetiapine Positive Cases

Compound	% Positive
Fentanyl	27%
Gabapentin	22.8%
Clonazepam	19%
Cocaine	10.9%
Methamphetamine	9.9%

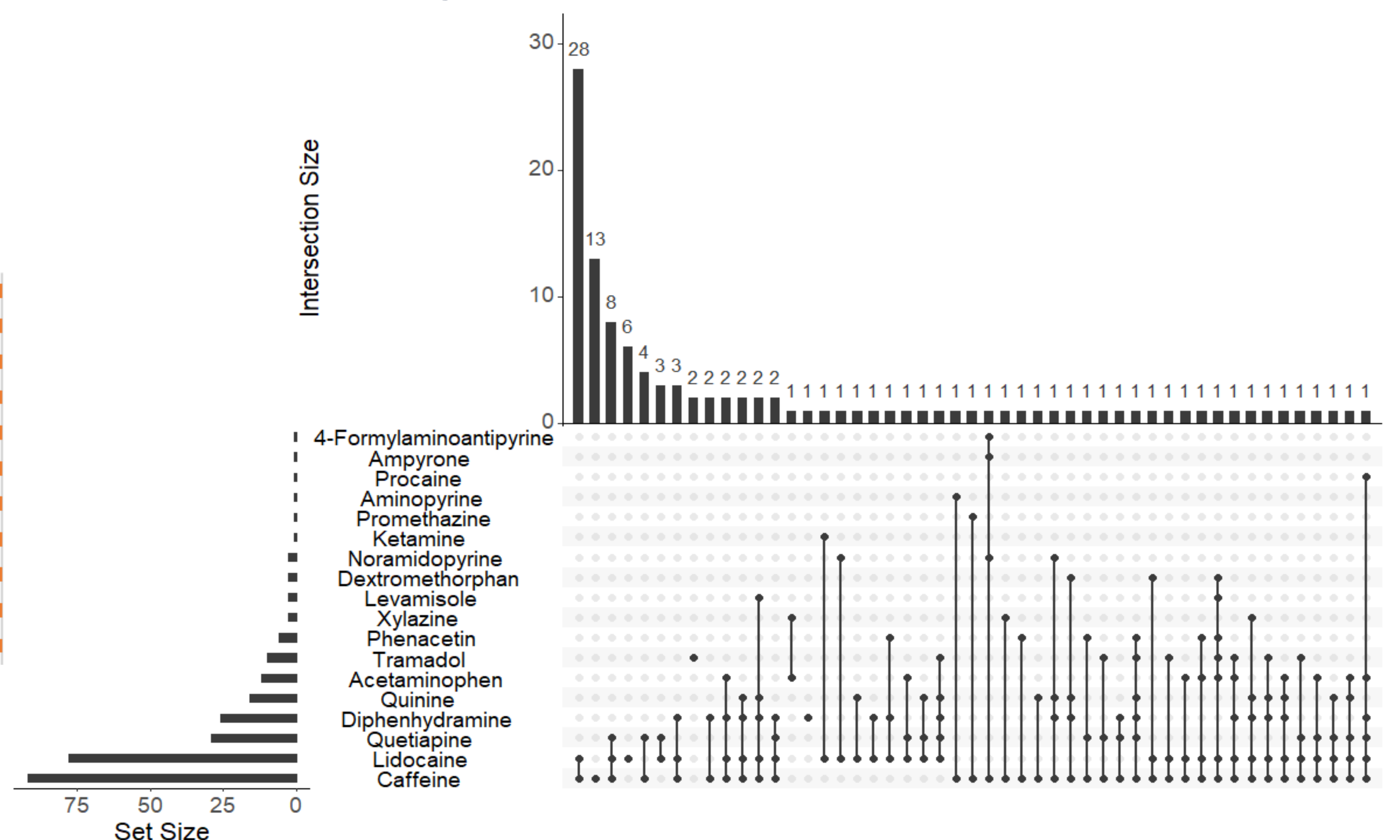
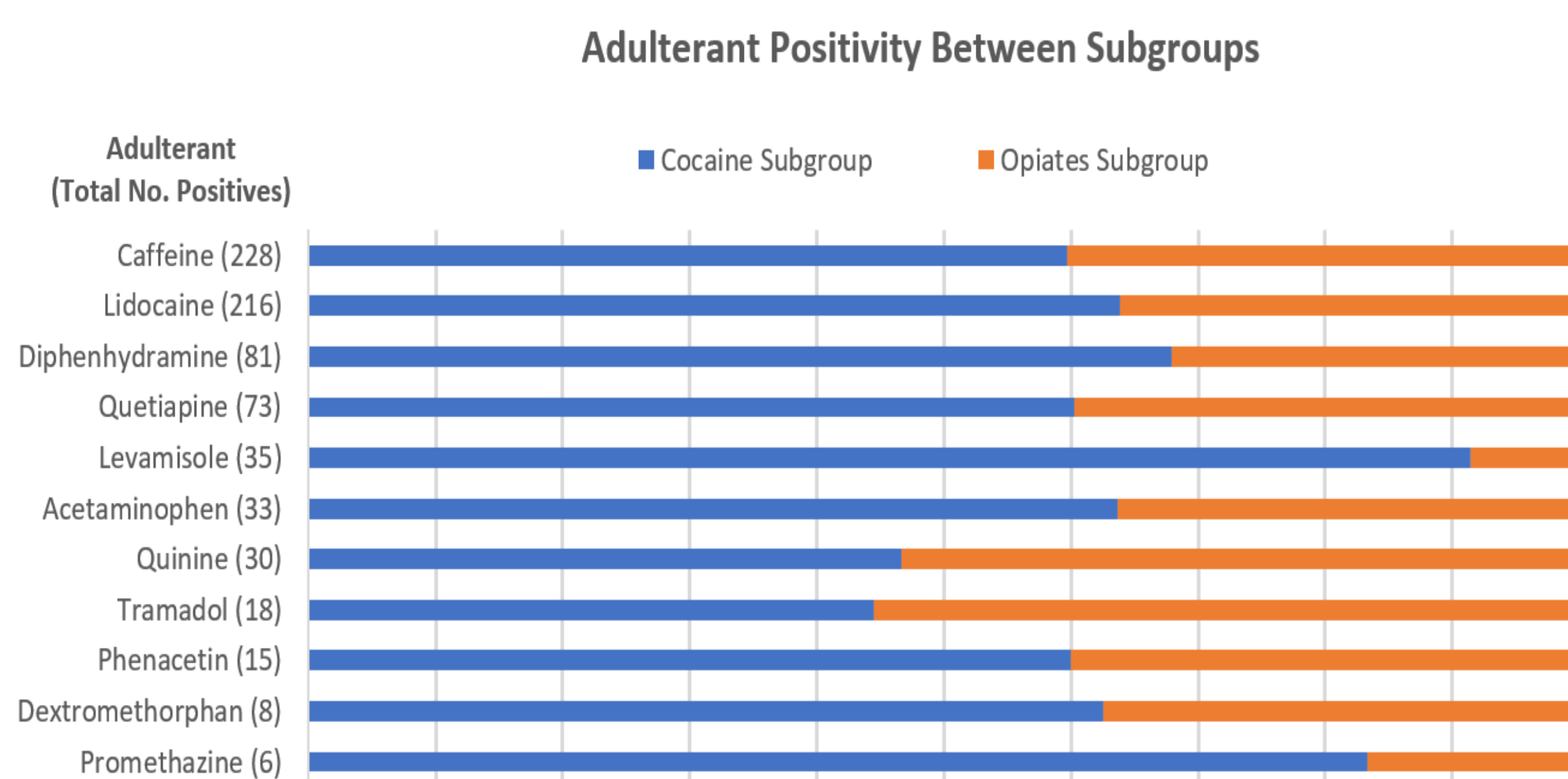
Quetiapine (% weight) Content in Fentanyl Seized Drug Casework

Compound	% Positive
Quetiapine	5% by weight
Fentanyl	13% by weight
Xylazine	34% by weight

Quetiapine Toxicity

- Sedation particularly when combined with alcohol, benzodiazepines, and opioids.
- Dizziness
- Delirium/confusion
- Orthostatic hypotension
- Cardiac dysrhythmia
- QTc prolongation
- Hyperglycemia
- Respiratory depression with concurrent severe underlying disease or taken in overdose amounts
- Rare effects: seizures including late onset and neuroleptic malignant syndrome

Quetiapine Co-Positivity in Umbilical Cord Tissue from At-Risk Pregnancies (Midthun et al, 2023)



Conclusions

- Quetiapine (Seroquel®) is an atypical antipsychotic medication used in the treatment of schizophrenia, and bipolar disorder. It influences mood, helping to reduce symptoms of depression. Quetiapine causes sedation and sleepiness and has extensive off-label use as a sleep aid, although it is not approved for this application because of its broad side effect profile which includes orthostatic hypotension, seizures, priapism, high blood sugar, tardive dyskinesia, and neuroleptic malignant syndrome.
- Quetiapine has also been identified as a toxic adulterating substance in the illicit drug supply being used to cut heroin, cocaine, and fentanyl since at least 2018, has subsequently been identified in syringes used by IV drug users, and in umbilical cord tissue from live births in at risk pregnancies.
- Quetiapine has shown persistent and stable presence in forensic toxicological casework and may be favored as an adulterant for its contributory sedative effects. Both fentanyl and cocaine are known to have serotonergic effects and have been linked to neuroleptic malignant syndrome, raising the risk of life-threatening drug interactions when mixed with quetiapine.

References

- <https://www.cfsre.org/nps-discovery/public-alerts/quetiapine-a-toxic-adulterant-found-in-illicit-drugs>
- Midthun KM, Nelson BN, Strathmann FG, Browne T, Logan BK. Analysis of umbilical cord tissue as an indicator of *in utero* exposure to toxic adulterating substances. *Front Pediatr.* 2023 Mar 21;11:1127020.
- Singh VM, Browne T, Montgomery J. The Emerging Role of Toxic Adulterants in Street Drugs in the US Illicit Opioid Crisis. *Public Health Rep.* 2020 Jan;135(1):6-10.
- Andersen FD, Joca S, Hvingelby V, Arjmand S, Pinilla E, Steffensen SC, Simonsen U, Andersen CU. Combined effects of quetiapine and opioids: A study of autopsy cases, drug users and sedation in rats. *Addict Biol.* 2022 Sep;27(5):e13214.

