K28 Canadian Blood Drug Concentration Regulations and Drug-Impaired Driving Cases: A Snapshot of Findings in the Province of Québec

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Learning Overview: The goal of this presentation is to provide a portrait of findings (prevalence, blood concentrations) for the ten substances covered by the new Canadian Blood Drug Concentration Regulations.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by providing attendees with an assessment of the impact of such a legislation, and observed blood concentration distributions, contributing to the discussion regarding legal thresholds for these substances.

Introduction: On June 26, 2018, a new Driving Under the Influence of Drugs (DUID) law came into force in Canada. Some key elements of this legislation were increasing ease of access to suspects' blood samples, and introduction of *per se* regulation for 10 drugs. This study assesses the impact of this legislation on casework for the province of Québec and draws a portrait of findings for these 10 substances targeted by the new regulation.

Method: Blood samples were systematically analyzed by liquid chromatography coupled to tandem mass spectrometry. For all DUID cases treated by the laboratory, data related to drivers (age, gender), the arrest (date, time, location, investigative tools), the sample(s) (collection date and time, type of biological matrix) and findings (detected analytes and concentrations) were compiled using a Microsoft® Excel® database. Summary statistics and data visualization were generated using Excel®, R, and RStudio®.

Results: Implementation of this new legislation led to a 226% increase in whole blood DUID cases. Between June 26, 2018, and August 1, 2020, 808 such cases were treated. Of these, 572 (71%) did test positive for at least one of the drugs covered by the Blood Drug Concentration Regulations, 535 (66%) having at least one drug over the *per se*. Prevalence and concentration data are summarized in the following table.

Drugs	*Per se*	Reporting limit	Prevalence	Median	Range
Tetrahydrocannabinol (THC)	2ng/mL* 5ng/mL	0.5ng/mL	38% (n=308)	3.7ng/mL	0.7–53
Methamphetamine	Any DL**	10ng/mL	37% (*n*=296)	210ng/mL	14–1,480
Cocaine	Any DL	10ng/mL	14% (*n*=114)	62ng/mL	14–1302
Gamma-hydroxybutyrate (GHB)	5mg/L	10mg/L	14% (*n*=110)	108mg/L	11–417
Ketamine	Any DL	10ng/mL	3% (*n*=22)	159ng/mL	15–988
Psilocin	Any DL	5ng/mL	0.1% (*n*=1)	Not quantified	
Psilocybin	Any DL	Not analyzed	NA	NA	NA
Lysergic acid diethylamide (LSD)	Any DL	1ng/mL	0.0% (*n*=0)	NA	NA
Phencyclidine (PCP)	Any DL	10ng/mL	0.0% (*n*=0)	NA	NA
6-Monoacetylmorphine	Any DL	5ng/mL	0.0% (*n*=0)	NA	NA

*Summary offense (less severe): 2ng/mL, hybrid offense: 5ng/mL. **Any detectable level.

Other prevalent illicit drug findings in whole blood samples included Methylenedioxymethamphetamine (MDMA, 33 cases), flubromazolam (26), flualprazolam (21), and etizolam (11). Of the MDMA cases, 9 did not show concomitant presence of a regulated drug, 8 synthetic benzodiazepines cases were in the same situation. Other prevalent prescription drug findings (which may also be used recreationally) included citalopram/escitalopram, diphenhydramine, clonazepam/metabolite, venlafaxine, pregabalin, and quetiapine.

Conclusion: Implementation of new *per se* regulations in Canada and easing up the access to blood collection did have a significant impact on caseload. The regulation was successful in targeting the most prevalent illicit drugs. MDMA and synthetic benzodiazepines, while not covered by this legislation, also show significant prevalence.

DUID, *Per Se*, Blood Concentration