

DSEN ABSTRACT

Hydromorphone controlled release drug injection and hepatitis C virus (HCV), and human immunodeficiency virus (HIV) and infectious endocarditis (IE) infection

Summary

- Injecting oral hydromorphone can lead to serious infections.
- We observed a higher incidence of HCV infection, particularly among hydromorphone users, including controlled-release formulation.
- Limited number of HCR users and low HIV and IE incidence precluded precise comparisons.

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Hydromorphone includes immediate and CR formulations; other opioid: other opioids except hydromorphone; other drug: any injectable drug except opioids; non-HCR: any injectable drug except HCR.

1.adjusted for sex, age, race, year enrollment, and other variables. 2. adjusted for age, sex, race/ethnicity, frequency of injection drug use, and recent hospitalization for serious injection-related infection (for IE model).

What is the current situation? Injection of oral hydromorphone may lead to infections with HCV, HIV, and IE. There are concerns of increased harm specifically with hydromorphone controlled-release capsules (HCR), but a Health Canada safety review found limited evidence. More research was needed.

The study aims were to:

- Describe frequency of HCV, HIV, and IE infection in people who inject drugs.
- Compare rates of HCV and HIV infection in PWID injecting HCR, immediate-release (oral) hydromorphone, injectable hydromorphone, or other CR products (QC and ON).
- Describe HCR users who experienced HCV, HIV and/or IE infection (QC and ON).

How was the study conducted?

We used data from prospective Canadian cohorts of people who inject drugs.

- **Quebec** - The Hepatitis Cohort (**HEPCO**): PWID (18+) in Montreal (n=809, Jan.2011-Dec.2020). Interview-administered questionnaires and blood sampling occurred at baseline and every 3 months.

- **Ontario** - The Ontario Integrated Supervised Injection Services (**OiSIS-Toronto**): people who inject drugs (18+) in Toronto (n=701, Nov.2018-Mar.2020). This collected self-reported questionnaire data linked to administrative healthcare data (ICES).

- **British Columbia** - The At-Risk Youth Study (ARYS); the Vancouver Injection Drug Users Study (VIDUS); AIDS Care Cohort to Evaluate Exposure to Survival Services (ACCESS): PWID in Vancouver (n=3,952, Jan.2006-Mar.2020). Interview-administered questionnaires and blood sampling was done every 6 months.

Outcomes were based on blood tests for QC and BC, but on claims data for ON.

What did the study find?

- Participants' median age was 30-40, mostly white and self-reported cisgender men.
- Variable rates of hydromorphone injection for QC (11.7%), BC (13.1%) and ON (35.9%).
- High incidence of HCV infection among PWID.
- Higher incidence of HCV infection among hydromorphone users, including HCR.

Limited number of HCR users and relatively few HIV and IE events precluded precise estimates for comparisons across formulations and outcomes.

	Hazard ratio (95%CI)
HEPCO¹	HCV
	HCR vs non-HCR: 1.8 (0.5 – 5.6)
	HCR vs other drug: 3.7 (1.1 – 12.2)
	Other opioid vs other drug: 4.5 (3.0 – 6.8)
	Heroin vs other drug: 0.9 (0.4 – 1.9)
OiSIS²	HCV
	Hydromorphone vs other CR: 2.2 (0.5-9.2)
	Hydromorphone vs other drug: 2.2 (1.2-4.1)
	IE
	Hydromorphone vs other CR: 0.6 (0.0-6.5)
	Hydromorphone vs other drug: 0.8 (0.2-3.5)

	Incidence per 100 PY (95%CI)
HEPCO	HCV
	HCR: 16.3 (4.1 – 44.3)
	Other opioid: 21.1 (16.9 – 26.2)
	Heroin: 3.3 (1.6 – 6.1)
	Other drug: 3.6 (2.6 – 4.8)
OiSIS	HCV
	Hydromorphone: 20.2 (-)
	Other CR opioid: 9.9 (-)
	Other drug: 9.0 (-)
	IE
	Hydromorphone: 1.6 (-)
	Other CR opioid: 3.3 (-)
	Other drug: 1.8 (-)
BC cohorts	Any injectable drug
	HCV : 8.0 (6.3-10.2)
	HIV : 0.4 (0.3-0.6)
	IE : 0.5 (0.4-0.7)