

DSEN ABSTRACT

Prescription patterns of ranitidine, nizatidine, famotidine, and cimetidine in Canada

A study conducted by the Canadian Network for Observational Drug Effect Studies (CNODES)

Summary

- This large drug utilization review of histamine-2 receptor antagonists (H2RA) involved over ten million Canadians in six provinces.
- Ranitidine was the most commonly dispensed H2RA.
- Between 1996 and 2019, ranitidine use declined substantially in persons aged > 65 y and remained stable in those < 65 y.
- Even in the most recent period (2015 - 2019), there was still substantial exposure to ranitidine in the population: an estimated mean of 130 million Defined Daily Doses annually in five provinces.

Key messages

- The population exposure to ranitidine can also inform a pharmacoepidemiologic study of cancer risk in Canada. CNODES is well positioned to undertake a large study of the risk of ranitidine exposure and cancer.

Project Lead & Team

- Adrian Levy, PhD
- Team members [available here](#)

Link to publication

- [Levy et al. CMAJ Open 2022](#)

What is the issue?

- Histamine-2 receptor antagonists (H₂RA: ranitidine, nizatidine, famotidine and cimetidine) are commonly used to treat heartburn.
- In September 2019, Health Canada stopped the distribution of ranitidine due to potentially high concentrations of the possible carcinogen N-nitrosodimethylamine (NDMA).

What was the aim of the study?

- This study, conducted by CNODES, examined the patterns of dispensed H₂RAs in Canada by describing demographic and clinical characteristics of users and prescribers and by quantifying rates of use and population exposures.

How was the study conducted?

- CNODES conducted a population-based serial cross-sectional design using prescription claims from community pharmacies in Nova Scotia, Ontario, Manitoba, Saskatchewan, Alberta, and British Columbia).
- Demographic and clinical characteristics of users and prescribers were characterized among subjects newly dispensed an H₂RA from 2015 to 2019.
- Rates of use and population exposures from 1996 to 2019 were calculated using mean annual dispensation rates and standardized/cumulative Defined Daily Doses
- Results presented by age ≥ 65 years (5 provinces) and < 65 years (MB, SK, BC).

What did the study find?

- Overall number of people dispensed at least one H₂RA:
 - ≥ 65 years: over 4.6 million; < 65 years: over 22 million
- Ranitidine prescriptions dispensed:
 - ≥ 65 years: over 2.4 million; < 65 years: 1.7 million
- Other H₂RA prescriptions dispensed:
 - ≥ 65 years: 0.7 million; < 65 years: 0.6 million
- Analysis of contemporary H₂RA users (2015 - 2019)
 - Ranitidine accounted for > 90% of H₂RAs dispensed (60% - 65% dispensed to women)
 - H₂RAs were most commonly prescribed by primary care physicians
 - Most switches from H₂RAs were to a proton pump inhibitor
- Analysis of rates of dispensations (1996 - 2019)
 - For both age groups (≥ 65 years and < 65 years), ranitidine was the most commonly used H₂RA and the temporal changes in use followed the same patterns for both sexes
 - ≥ 65 years: ranitidine use peaked 1996 - 2004 and subsequently declined
 - < 65 years: ranitidine use remained stable 1996 - 2019
- Analysis of population exposures to ranitidine (1996-2019)
 - ≥ 65 years: highest standardized DDDs in NS
 - < 65 years: highest standardized DDDs in SK
 - Estimated annual mean of 130 million ranitidine DDDs.

This research was funded by CIHR – Drug Safety and Effectiveness Network and conducted by CNODES:



Canadian Institutes of Health Research
Instituts de recherche en santé du Canada



For more information, please contact info@cnodes.ca.