

## Short Communication

# Inappropriate Prescription of Proton Pump Inhibitors in a Community Dwelling Older Adults

Patrick Viet-Quoc Nguyen<sup>1,2\*</sup><sup>1</sup>CHUM Research Center, Canada<sup>2</sup>Réseau Québécois de Recherche en Vieillesse, Canada**\*Corresponding author**

Patrick Viet-Quoc Nguyen, CHUM Research Center, 1000 Rue Saint-Denis, Montréal, Québec, H2X 0C1, Canada, Tel: (+1) 514-890-8000; Email: patrick.nguyen@umontreal.ca

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- Proton pump inhibitors
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**Abstract**

**Background:** Proton pump inhibitors (PPI) are widely used for the treatment gastrointestinal diseases. The use of PPI is not without risk as it is associated with many conditions such as osteoporosis or hypomagnesemia. The objective of this study was to assess PPI prescriptions in an ambulatory setting.

**Methods:** Older adults presenting at the emergency department of a teaching hospital were prospectively assessed for use of a PPI at home. On the basis of a patient interview and a review of their medical record, the appropriateness of PPI prescription was evaluated according to the current guidelines in the province of Quebec.

**Results:** During the study period, 2417 patients were screened and 536 older adults were included in the study. Using the PPI practice guideline, 184 patients (34.3%) were prescribed a PPI for an inappropriate indication.

**Conclusion:** In conclusion, inappropriate PPI prescription remains an important issue in the older population since it exposes may older adults to a risk of adverse reaction without a proper indication. It is therefore of the utmost importance to reassess the indication of PPI every time it is prescribed.

**BACKGROUND**

Proton pump inhibitors (PPI) are widely prescribed acid suppressant drugs. Despite its efficacy, PPI are not without potential adverse reactions. PPI have been associated with health conditions such as dementia, hypomagnesemia, infection and fracture [1-3]. Recently, PPI use has been associated with an independent increase in the risk of contracting COVID-19, increase in severity and mortality from COVID-19 [4,5]. PPI inappropriate use is widely described in literature. In recent studies, inappropriate PPI prescription rate varies from 32 to 72% [6-10].

The objective of this study was to assess the prevalence of inappropriate PPI prescriptions in community dwelling older adults.

**MATERIAL AND METHODS**

This was a prospective cross-sectional study at the emergency department of the Centre Hospitalier de l'Université de Montréal (CHUM) in Canada. The CHUM is a multispecialty tertiary care teaching hospital over three physical locations each with its own emergency department (ED). Adults 65 years and older presenting to the emergency department and taking a PPI at home at the time of admission were recruited for the study.

Methods for this study were published previously [11].

From June 20 2016, to March 29 2017, screening was performed during weekdays. Patients whose PPI therapy was initiated during the emergency hospital stay was excluded. The data was collected from a patient interview as well as the medical and nursing observation sheets in patient charts. Demographic data were age, gender and reason for the consultation. We recorded the indication for PPI treatment or prophylaxis. Concomitant use of NSAIDs, oral and parenteral anticoagulants, steroids, platelet aggregation inhibitors, and selective serotonin receptor inhibitor (SSRI) was collected

Quebec PPI use guidelines were used to determine the appropriateness of drug prescription [12]. Appropriateness criteria were described previously [11].

Continuous and categorical variables were described using mean and proportion values respectively. Analyses were performed using SPSS 24 (IBM, New York, USA). The study protocol was approved by the CHUM research and ethics board. A verbal patient consent was required before the interview.

**RESULTS**

During the study period, 2417 patients were screened and 600 patients met the inclusion criteria and 536 were included in

the study. A total of 1458 patients were not prescribed a PPI at home, 335 patients were aged under 65 years old, 64 patients refused to participate in the study and 24 patients were incapable to answer the survey. Patients' mean age was  $78 \pm 8$  years (n  $\pm$  SD) and 58.6% were female. The medical conditions of the study population are described in Table 1.

Gastroesophageal reflux affected 47.9% (n=257) patients. Dyspepsia affected 31.2% (n=167) patients. A total of 2.2% (n=12) were on a helicobacter pylori PPI therapy and 1.5% (n=8) were on a PPI ulcer therapy. For drugs increase the risk of gastrointestinal discomfort or bleeding, 15.7% (n=84) patients took steroids, 38.4% (n=206) were prescribed low-dose aspirin, 3.9% (n=21) had a non-steroid anti-inflammatory, 9.1% (n=49) had an ADP antiplatelet agent and 2.4% (n=13) were anticoagulated.

Overall, 352 patients (65.7%) were prescribed a PPI for an appropriate indication.

## DISCUSSION

Overall, this study reported a 34.3% incidence of inappropriate prescriptions of PPI in a community setting according to the Quebec practice guidelines. The appropriate use of PPI has been studied but only a few studies addressed the prescription of PPI in older patients. In 2019, Mafi et al., conducted a retrospective electronic chart based study on 69,352 older adults in which 12.6% were prescribed a PPI. Of the 399 PPI prescriptions evaluated, 35.8% were potentially of low value [13]. These results are similar to those reported in this study.

Most studies on the appropriateness of PPI prescription use a retrospective design. The prospective design of this study is a major advantage or the internal validity. This design reduced the risk of missing data in patient charts which could inflate the evaluation of inappropriate PPI prescriptions.

Despite the patient interview and medical chart review, it is possible that medical data may be missing due to memory bias and missing data in medical charts. Indication for PPI was determined in part in the patient interview. Patients may report gastric disease not based on medical diagnosis which may also lead to overestimation of appropriate PPI prescriptions.

## CONCLUSION

In conclusion, inappropriate PPI prescription remains an important issue in the older population since it exposes many older adults to a risk of adverse reaction without a proper indication. It is therefore of the utmost importance to reassess the indication of PPI every time it is prescribed.

Medical history	N (%)
Gastrointestinal	384 (71.6)
Neurology	62 (11.6)
Psychiatry	101 (18.8)
Cardiovascular	446 (83.2)
Pulmonary	183 (34.1)
Chronic Kidney Failure	52 (9.7)
Cancer	140 (26.1)

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