Accuracy of Self-reported Prescribed Analgesic Medication Use

Linkage Between the Quebec Pain Registry and the Quebec Administrative Prescription Claims Databases

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Objectives: The validity of studies conducted with patient registries depends on the accuracy of the self-reported clinical data. As of now, studies about the validity of self-reported use of analgesics among chronic pain (CP) populations are scarce. The objective of this study was to assess the accuracy of self-reported prescribed analgesic medication use. This was attained by comparing the data collected in the Quebec Pain Registry (QPR) database to those contained in the Quebec administrative prescription claims database (Régie de l'assurance maladie du Québec [RAMQ]).

Methods: To achieve the linkage between the QPR and the RAMQ databases, the first 1285 patients who were consecutively enrolled in the QPR between October 31, 2008 and January 27, 2010 were contacted by mail and invited to participate in a study in which they had to provide their unique RAMQ health insurance number. Using RAMQ prescription claims as the reference standard, κ coefficients, sensitivity, specificity, and their respective 95% confidence intervals were calculated for each therapeutic class of prescribed analgesic drugs that the participants reported taking currently and in the past 12 months.

Results: A total of 569 QPR patients responded to the postal mailing, provided their unique health insurance number, and gave informed consent for the linkage (response proportion = 44%). Complete RAMQ prescription claims over the 12 months before patient enrollment into the QPR were available for 272 patients, who constituted our validated study population. Regarding current self-reported prescribed analgesic use, κ coefficients measuring agreement between the 2 sources of information ranged from 0.66 to 0.78 for COX-2-selective nonsteroidal anti-inflammatory drugs, anticonvulsants, antidepressants, skeletal muscle relaxants, synthetic cannabinoids, opiate agonists/partial agonists/antagonists, and antimigraine agents therapeutic classes. For the past 12-month self-reported prescribed analgesic use, QPR patients were less accurate regarding anticonvulsants (κ = 0.59), opiate agonists/partial agonists/antagonists (κ = 0.57), and antimigraine agents use (κ = 0.39).

Discussion: Information about current prescribed analgesic medication use as reported by CP patients was accurate for the main therapeutic drug classes used in CP management. Accuracy of the past year self-reported prescribed analgesic use was somewhat lower but only for certain classes of medication, the concordance being good on all the others.

Key Words: chronic pain, analgesic medication, patient registry, administrative prescription claims database, agreement, accuracy, sensitivity, specificity

(*Clin J Pain* 2016;32:95–102)

Patient registries are defined as organized infrastructures that use observational study methods to collect uniform data to evaluate specific outcomes for a population defined by particular health conditions or exposures.[1] These sources of data are intended to serve predetermined scientific, clinical, and policy purposes.[1] Patient registries are increasingly being used for clinical research as they provide comprehensive and standardized real-world longitudinal data for the study of course of diseases, medical practices, treatments, and outcomes on carefully defined cohorts of patients.[1–6] In contrast to health care system or third-payer administrative databases that are created as a byproduct of claims for medical services reimbursement in a fee-for-service billing system, patient registries are based on patient-reported or clinician-reported data and they have as primary purpose to describe the progression of diseases, to evaluate the safety and the benefits of treatments in real-world settings, or to measure quality of care. Another important value of patient registries resides in the availability of data on sociodemographic risk factors, lifestyle choices, patient-reported outcomes (eg, quality of life, emotional

Received for publication June 26, 2014; revised May 11, 2015; accepted April 8, 2015.

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Supported by: (1) the Quebec Pain Research Network (QPRN) which is funded by the Fonds de la recherche du Québec-Santé (FRQS) in partnership with the Quebec Ministry of Health, Pfizer Canada Inc., and AstraZeneca Inc.; and (2) the Réseau québécois de recherche sur l'utilisation du médicament of the FRQS, Province of Quebec. During the study, A.L. received a postdoctoral research award from the FRQS. M.A.W. is a research scholar of the FRSQ (Junior II). The remaining authors declare no conflict of interest.

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DOI: 10.1097/AJP.0000000000000248

functioning), and over-the-counter medication use. Pain registries are becoming more popular in subspecialties of pain medicine such as acute postoperative pain, neuropathic pain, arthritis, and regional anesthesia.[1,7–15]

The validity of studies conducted with patient registries depends on the accuracy of the self-reported clinical data. For example, self-reported analgesic medication use can be subject to misclassification and recall bias. Indeed, previous studies have shown that the accuracy of self-reported medication use varies across patient populations, therapeutic classes, number of drugs used and duration of use, patients' characteristics, evaluation time windows, and data collection methods.[16–24] To our knowledge, only 1 study has focused on self-reported use of analgesics among patients reporting chronic pain (CP).[19] Further research is clearly needed to assess the validity of this type of information and the extent to which it can be used for research purposes in the field of pain management and patient outcomes. The present validation study was therefore designed to document the accuracy of different therapeutic classes of prescribed drugs that people with CP reported using currently and in the past 12 months for their pain.

METHODOLOGY

Data Sources

This validation study was conducted with data collected in the Quebec Pain Registry (QPR), a web-based registry of individuals reporting CP that uses identical clinical descriptors, uniform self-reported outcomes, and common validated/standardized measurement tools. QPR data on analgesic use was compared with those contained in the administrative prescription claims database of the Régie de l'assurance maladie du Québec (RAMQ).

QPR Database

As a strategic initiative of the Quebec Pain Research Network (one of the research networks funded by the Fonds de la recherche du Québec-Santé), the QPR was put in place in the province of Quebec (Canada) in 2008 with the objective of creating a common data registry of individuals with CP who are seen and followed within tertiary care clinics offering multidisciplinary pain treatment (http:\\www.quebecpainregistry.com).[25] CP patients aged 18 years and older are enrolled in the QPR when they are scheduled for a first appointment or a new consultation at one of the participating pain clinics. Patients are informed that they all have to complete the QPR questionnaires because the collected information is used for clinical and administrative purposes—that is, production of (1) a written or electronic summary of their clinical biopsychosocial condition for the health care team; and (2) useful administrative statistics (eg, annual report). Referrals to these clinics come mostly from patients' treating primary or secondary care physicians but some may also come from tertiary care medical specialties. Patients are excluded from the QPR if they are not able to understand and read French or English language. The same is true for those who cannot answer questionnaires due to severe physical or psychological incapacities. Patients are informed that their QPR data can also be used on an anonymous basis for research endeavors if they provide written informed consent. At the time the present study was conducted, 90.5% of QPR patients gave such an informed consent, thus minimizing the possibility of selection bias. The QPR contains clinical data including CP diagnosis established by the physician of the pain clinic according to a standardized list of diagnostic codes. In addition, current and past pharmacological and nonpharmacological treatments, pain-related health care resource utilization, and medical status are collected by experienced well-trained nurses (the Registry Nurses) using a standardized structured interview protocol. Registry Nurses ask each patient to list the names (chemical name or brand name) of all medications they are currently taking to relieve their pain. If the patients seem hesitant, the Registry Nurse ask them to go and get all their medication bottles and read the information written on them (or to bring the bottles at the time of their first visit at the pain clinic). With regard to past 12-month pain medication, patients are asked "Did you use pain medication in the past year which you subsequently stopped taking?" If it is the case, the name(s) of the medication(s) are recorded along with the reason why it was stopped. In the event that patients do not remember their past pain medications, the Registry Nurses ask for their permission to consult their pharmacy dispensing chart. The names of all medications currently taken for medical reasons other than pain are also recorded by the Registry Nurses.

In addition, patients enrolled in the QPR are requested to complete a self-administered questionnaire that contains well-validated measurement tools on pain intensity and interference with various aspects of daily living (Brief Pain Inventory[26]), emotional well-being (eg, Beck Depression Inventory[27]), health-related quality of life (SF-12v2[28]), patient treatment expectations and perceived changes with treatment at the Pain Clinic (eg, Patient Global Impression of Change Scales[29]), and sociodemographic information, etc. For the purpose of this study, data that were collected within 4 weeks before the patients' initial visit at the pain clinics were used (baseline data included in the longitudinal follow-up of the QPR). When this study was conducted, the QPR was implemented in 3 multidisciplinary pain treatment clinics in the province of Quebec—that is, those of the (1) Centre hospitalier de l'Université de Montréal (CHUM), Montreal; (2) McGill University Health Centre (MUHC), Montreal; and (3) Centre hospitalier universitaire de Sherbrooke (CHUS), Sherbrooke, Québec, Canada.

Prescription Claims Database of RAMQ

The RAMQ is a governmental administrative database that contains information on medical services (diagnoses and procedures) received by Quebec residents. Although the RAMQ health insurance plan covers all residents for the costs of physician visits, hospitalizations, and medical procedures, it only covers a portion of them for the costs of prescribed medications. The RAMQ prescription claims database includes individuals 65 years and older, recipients of social assistance (welfare recipients), and workers and their family (adherents) who do not have access to a private drug insurance program, accounting for approximately 44% of the overall Quebec population.[30] It includes all pharmacists' claims for dispensed prescribed medications to these patients (excluding medication received in a hospital).

Study Population

The first 1285 patients who were consecutively enrolled in the QPR between its implementation on October 31, 2008 and January 27, 2010, who completed the initial visit self-administered questionnaire and the nurse-administered structured clinical interview, and who provided informed consent to allow the use of their data for research purposes were eligible for this study.

Procedure

This study was approved by the Research Ethic Boards (REB) of the CHUM, MUHC, and the CHUS as well as by the REB of the Commission d'accès à l'information of the Quebec Government. To achieve the linkage between the QPR database and the RAMQ prescription claims database, all eligible QPR patients were contacted by mail by the Medical Director of their respective pain clinic who informed them about the study objectives and invited them to read the study informed consent form. This form described the specific QPR and RAMQ variables used in the present study, the steps involved in the linkage of the 2 databases, and the strict precautions taken to protect confidentiality. The form also included a section in which the patients were invited to provide their RAMQ health insurance number, which is a unique personal identifier for each person living in Quebec. If the patients were interested in participating in the study, they were instructed to complete and sign the consent form, and to return it in the preaddressed and prestamped envelope. A postal reminder was sent to initial nonresponders after a 1-month period. For all patients who provided their RAMQ number and signed the consent form, a request was made to release QPR data on specific sociodemographic and clinical variables (including pharmacological pain treatments) according to the QPR Access and Agreement Policies.

The accuracy of current and past 12-month self-reported prescribed analgesic use was established using RAMQ prescription claims as the reference standard. The index date for linkage between the above QPR data with the RAMQ data was defined as the calendar date of the patient's initial visit to the pain clinic. Data requested from the RAMQ database included all the participants' prescribed medications which had been dispensed in the 12 months preceeding this index date. Only the date of dispensation and the common drug denomination were considered for the purposes of the present study. The linkage between the 2 databases was done using the patients' first name(s), family name(s), date of birth, sex, and unique health insurance number.

All self-reported and RAMQ prescription claims records of analgesic medications were first categorized into therapeutic classes according to American Hospital Formulary Service classification.[31] Medications considered in each therapeutic class are listed in Table 1. Although antidepressants and anticonvulsants can be used for the treatment of CP, the indications for which they are prescribed are not specified in the RAMQ database. Furthermore, some QPR patients may have reported using an antidepressant and/or an anticonvulsant but ignored that it was prescribed for their pain, and reported that they were using this medication for medical reasons other than pain. In the light of these considerations, we decided to include in our list all the medications owing to the antidepressant and anticonvulsant classes whether or not they were prescribed/used as analgesics. Self-reported over-the-counter pain medications were excluded from the analysis because they do not appear in the RAMQ database. However, an exception was made for nonsteroidal anti-inflammatory drugs (NSAIDs) because over-the-counter nonspecific NSAIDs can be recorded in RAMQ prescription claims when the physician chooses to write them down to allow the patient to save taxes or when these medications are prescribed in high dosages. Exclusion of specific medications from this therapeutic class would have been inappropriate given that it was impossible to predict whether or not they would appear in the RAMQ prescription claims database. As a result, concordance between the 2 sources of data was expected to be low for nonspecific NSAIDs.

For both data sources (QPR and RAMQ prescription claims database), patients were then classified as users (yes/no) if they had reported or had a record of at least 1 medication in the therapeutic analgesic class of interest (Table 1). Accuracy of self-reported analgesic medication use was evaluated for 2 different time windows reflecting current and past 12-month use.

Statistical Analyses

Descriptive statistics were calculated to summarize the characteristics of the study participants. For each therapeutic class of medication and for each evaluation time window, Cohen κ coefficients, sensitivity, specificity, positive predictive value (PPV), negative predictive value

TABLE 1. Classification of Analgesic Medications

Therapeutic Classes*	Medications†
Nonspecific NSAIDs	Acetylsalicylic acid, Mefenamic acid, Diclofenac, Diflunisal, Etodolac, Fluniprofen, Ibuprofen, Indomethacin, Ketoprofen, Ketorolac, Meloxicam, Nabumetone, Naproxen, Oxaprozin, Phenylbutazone, Piroxicam, Sulindac, Tenoxicam, Tiaprofenic acid
COX-2-selective NSAIDs	Celecoxib
Anticonvulsants	Carbamazepine, Clobazam, Clonazepam, Divalproex, Ethosuximide, Gabapentin, Lamotrigine, Levetiracetam, Mesuximide, Oxcarbazepine, Phenobarbital, Phenytoin, Pregabalin, Primidone, Tiagabine, Topiramate, Valproate sodique, Valproic acid, Vigabatrin
Antidepressants	Amitriptyline, Bupropion, Citalopram, Clomipramine, Desipramine, Desvenlafaxine, Doxepin, Duloxetine, Escitalopram, Fluoxetine, Fluvoxamine, Imipramine, Maprotiline, Mirtazapine, Nortriptyline, Paroxetine, Protriptyline, Sertraline, Trazodone, Venlafaxine
Skeletal muscle relaxants	Baclofen, Cyclobenzaprine, Dantrolene, Metaxalone, Orphenadrine, Tizanidine
Synthetic cannabinoids	Dronabinol, Nabilone
Opiate agonists/partial agonists/antagonists	Codeine, Fentanyl, Hydromorphone, Meperidine Methadone, Morphine, Oxycodone, Tapentadol Buprenorphine, Dextropropoxyphene, Nalbuphine Naloxone, Oxymorphone, Pentazocine, Sufentanil
Antimigraine agents	All triptans

*Therapeutic classes were defined according to American Hospital Formulary Service (AHFS) classification.[31]
†In some cases, medications that were self-reported by QPR patients were not available in Canada, eg, tiagabine.
COX-2 indicates cyclooxygenase-2; NSAIDs, nonsteroidal anti-inflammatory drugs.

(NPV), and their respective 95% confidence intervals were calculated to assess the concordance of the information retrieved from the QPR and RAMQ databases regarding the use (yes/no) of each therapeutic class of prescribed analgesic medication. On the basis of the commonly used benchmarks of Landis and Koch,[32] $\kappa < 0.2$ was considered as poor agreement between the 2 sources of information, $\kappa = 0.2$ to 0.4 as fair agreement, $\kappa = 0.41$ to 0.6 as moderate agreement, $\kappa = 0.61$ to 0.8 good agreement, and $\kappa > 0.8$ very good/almost perfect agreement. Measures of sensitivity were calculated to assess the probability of self-reporting the use of a given analgesic medication class when the record of this class is present in the RAMQ prescription claims database. Specificity indicates the probability of not self-reporting the use of a given analgesic class when this class is absent in the RAMQ prescription claims database. PPV indicates the probability that a record of a specific class of medication was present in the RAMQ prescription claims database when the patients self-report the use of this type of medication. NPV indicates the probability that a record of a specific class of analgesic medication was absent in the RAMQ prescription claims database when the patient did not self-report using this type of medication. The higher are the scores of sensitivity, specificity, PPV, and NPV (which range from 0 to 1), the better is the validity of the self-reported analgesic medication use. All statistical analyses were performed using SAS version 9.2 (SAS Institute, Cary, NC).

RESULTS

As shown in Figure 1, a total of 569 patients responded to the postal mailing, provided their unique health insurance number and gave informed consent for the linkage, which yielded an overall participation proportion of 44% among the QPR cohort of patients eligible to the present study. Participants (n = 569) and nonparticipants (n = 716) were comparable in terms of age at the time of the initial visit at the pain clinic (mean ± SD: 55.9 ± 13.4 vs. 52.4 ± 15.1), sex (woman: 57% vs. 60%), level of education (completed an university level: 24% vs. 26%), and average pain intensity in the past 7 days (6.7 ± 2.1 vs. 6.7 ± 2.1) (all $P > 0.05$). Linkage between the QPR and RAMQ databases was successful for 99% of these patients (n = 561). Complete RAMQ data on prescription claims over the 1-year period preceding the initial visit at the pain clinic were available for 272 of the 561 QPR patients, the others being not covered by the RAMQ medication insurance plan during the entire 12-month period or portions of it. This sample constituted our validation study population.

Demographics and pain characteristics of the study population are presented in Table 2. Participants' mean age was 60.7 ± 14.2 years and 57% were women. The majority reported experiencing pain for 1 year or more (84.2%) and CP being present for >5 years for 37.9% of the sample. Participants rated their average and worst pain intensity in the past 7 days at 6.9 ± 2.1 and 8.3 ± 1.8, respectively. The 4 most common CP syndromes among the study population were back pain (46.6%), fibromyalgia (9.6%), cervical pain (8.8%), and complex regional pain syndrome (7.7%). A neuropathic pain component was present in 57.9%.

Comparisons between the type of prescribed medication reported using for their pain and the RAMQ prescription claims records are presented in Table 3 for each therapeutic class of medication. There was a good agreement ($\kappa = 0.66$ to 0.78, see top part of Table 3) between the 2 sources of data regarding the current use of COX-2-selective NSAIDs, anticonvulsants, antidepressants, skeletal muscle relaxants, synthetic cannabinoids, opiate agonists/partial agonists/antagonists, and antimigraine agents therapeutic classes. As expected, agreement was poor for nonspecific NSAIDs. Sensitivity values were substantial for all therapeutic classes that were currently used (0.67-0.83), except for antimigraine agents and nonspecific NSAIDs. Specificity values were consistently high among all therapeutic classes ranging from 0.84 to 1.00.

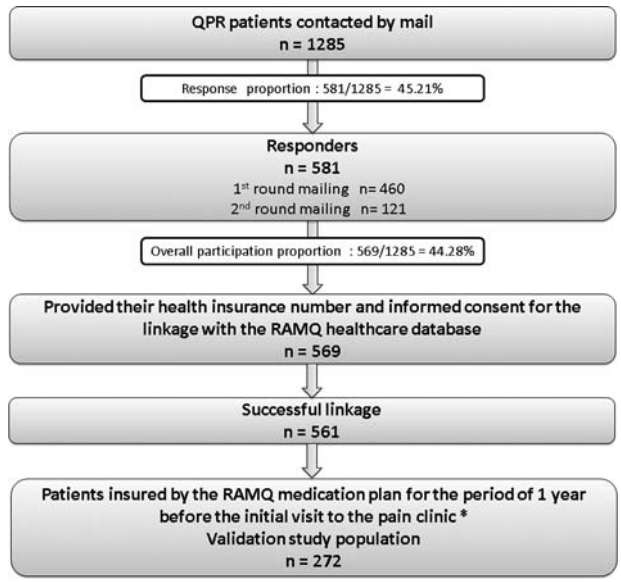

FIGURE 1. Study population and linkage flow-chart. *The RAMQ medication insurance plan covers only a portion of Quebec residents, that is, 65 years and older, recipients of social assistance (welfare recipients), and workers and their families (adherents) who do not have access to a private medication insurance program, accounting for approximately 44% of the overall Quebec population. QPR indicates Quebec Pain Registry; RAMQ, Régie de l'assurance maladie du Québec.

TABLE 2. Characteristics of the Study Participants (n = 272)

Sociodemographics	
Age (mean ± SD) (y)	60.68 ± 14.16
Sex (n [%])	
Female	155 (56.99)
Race/ethnicity (n [%])	
White	262 (96.32)
Other*	10 (3.68)
Completed education level (n [%])	
None	1 (0.37)
Elementary	35 (12.87)
High school	116 (42.65)
College	61 (22.43)
University	59 (21.69)
Living arrangement (n [%])	
Living alone	75 (27.57)
With spouse/partner	147 (54.04)
Other living arrangement†	50 (18.38)
Work status (n [%])	
Full-time job	16 (5.88)
Part-time job (can be a student but not a retired person)	16 (5.88)
Retired (without mention of disability; can have a part-time job)	109 (40.07)
Disability (temporary or permanent)	89 (32.72)
Unemployed	39 (14.34)
Student without a job	3 (1.10)
Household income (n [%]) (CDN$/y)	
< 20,000$	100 (40.98)
Between 20,000 and 49,999$	102 (41.80)
Between 50,000 and 79,999$	28 (11.48)
80,000$ and over	14 (5.74)
Pain characteristics	
Pain duration (n [%]) (y)	
< 1	43 (15.81)
1-5	126 (46.32)
≥ 6	103 (37.87)
Pain frequency in the past 7 d (n [%])	
Always present	246 (90.44)
Occasionally	25 (9.19)
No pain in the past 7 d	1 (0.37)
Pain intensity right now (0-10 numeric scale) (mean ± SD)	6.59 ± 2.44
Pain intensity on the average in the past 7 d (0-10 numeric scale) (mean ± SD)	6.92 ± 2.13
Pain intensity at its worst in the past 7 d (0-10 numeric scale) (mean ± SD)	8.34 ± 1.84
Pain localization‡ (evaluated by the physician of the pain clinic using the Quebec Pain Registry classification) (n [%])	
Lumbar pain	138 (50.74)
Lower limb pain	38 (13.97)
Generalized syndromes	34 (12.50)
Upper limb pain	32 (11.76)
Cervical pain	24 (8.82)
Head and face painful syndromes	14 (5.15)
Thoracic pain	15 (5.51)
Abdominal pain	8 (2.94)
Sacral pain	6 (2.21)
Pelvic pain	4 (1.47)
Coccygeal pain	1 (0.37)
Neuropathic pain (n [%])	
Presence of a neuropathic pain component (DN4 total score ≥ 4[33])	146 (57.94)
Chronic pain diagnosis‡ (established by the physician of the pain clinic using the Quebec Pain Registry classification) (n [%])	
Back pain§	135 (46.63)
Fibromyalgia	26 (9.56)
Cervical pain	24 (8.82)
Complex Regional Pain Syndrome (CRPS)	21 (7.72)
Postherpetic neuralgia	9 (3.31)
Osteoarthritis	4 (1.47)
Headaches/migraines	4 (1.47
Trigeminal neuralgia	3 (1.10)
Phantom limb pain	2 (0.74)
Herpes zoster	2 (0.74)
Rheumatoid arthritis	1 (0.37)
Irritable bowel syndrome	0 (0.00)

For all the study variables presented above, there were no missing values except for annual family income for which 10.3% of the patients did not wish to answer.

*Including black, native American, Hispanic, and Asian.

†Including living with children, grandchildren, parents, siblings, roommate(s), or no stable living arrangement.

‡Pain localization and diagnosis categories are not mutually exclusive.

§Excluding herpes zoster and postherpethic neuralgia in the lumbar region.

With regard to past year use of prescribed analgesic medications (bottom part of Table 3), agreement between self-reported use and RAMQ prescription claims database was very good for synthetic cannabinoids ($\kappa = 0.83$), and good for COX-2-selective NSAIDs ($\kappa = 0.63$), antidepressants ($\kappa = 0.70$), and skeletal muscle relaxants ($\kappa = 0.62$). Moderate but close to good agreement was found for anticonvulsants ($\kappa = 0.59$) and opiate agonists/partial agonists/antagonists ($\kappa = 0.57$), whereas it was only fair for antimigraine agents ($\kappa = 0.36$). Nonspecific NSAIDs showed again a very low κ value. Sensitivity values varied between 0.70 and 0.77 for anticonvulsants, antidepressants, synthetic cannabinoids, and opiate agonists/partial agonists/antagonists and specificity values were consistently high among all therapeutic classes used in the past year (0.87 to 1.00). PPV and NPV values were ≥ 0.65 among all therapeutic classes and among the 2 different time windows (current and past 12-mo use) except for nonspecific NSAIDs.

DISCUSSION

This study was the first to evaluate the accuracy of self-reported use of analgesics with data collected in a patient registry involving individuals with various types of CP syndromes. The results revealed that the information reported by the patients about their current pain medication was accurate for the main therapeutic classes used in CP management.

The response proportion achieved in the present study (44%) was comparable to what was reported in similar postal surveys conducted in the province of Quebec (39% to 44%).[34,35] There were no significant differences between participants and nonparticipants regarding age, sex, level of education, and pain intensity, suggesting that patients who accepted to take part in the study were representative of the patients enrolled in the QPR. However, we cannot exclude the possibility of sampling bias because participants and nonparticipants could be different regarding some other variables (eg, concerns about their health or confidentiality, prevalence of drug misuse or abuse).

The sample used for the validation study consisted of patients who were covered by the RAMQ medication insurance plan and excluded those who had private insurance plan, thereby reducing our sample size. The observed prevalence of some CP syndromes such as osteoarthritis

TABLE 3. Agreement Between Patients' Self-reported Types of Prescribed Analgesic Medication and RAMQ Administrative Prescription Claims Database Records Among the Study Population (n = 272)

	QPR Self-reported Data (n = 272)		RAMQ Prescription Claims Database (n = 272)		Agreement†		Validity Measures							
Therapeutic Classes*	No	Yes	No	Yes	κ	95% CI	Sensitivity	95% CI	Specificity	95% CI	PPV	95% CI	NPV	95% CI
Evaluation time window #1: current use of prescribed analgesics														
Nonspecific NSAIDs	207	53	155	105	0.11	0.00-0.23	0.27	0.19-0.36	0.84	0.77-0.89	0.53	0.39-0.67	0.63	0.56-0.69
COX-2-selective NSAIDs	234	26	236	24	0.78	0.65-0.91	0.83	0.63-0.95	0.97	0.95-0.99	0.77	0.56-0.91	0.98	0.70-1.00
Anticonvulsants	157	103	131	129	0.66	0.57-0.75	0.73	0.64-0.80	0.93	0.87-0.97	0.91	0.84-0.96	0.77	0.70-0.84
Antidepressants	158	102	152	108	0.76	0.68-0.84	0.83	0.75-0.90	0.92	0.87-0.96	0.88	0.80-0.94	0.89	0.83-0.93
Skeletal muscle relaxants	234	26	237	23	0.66	0.50-0.82	0.74	0.52-0.90	0.96	0.93-0.98	0.65	0.44-0.83	0.97	0.95-0.99
Synthetic cannabinoids	254	6	254	6	0.66	0.35-0.97	0.67	0.22-0.96	0.99	0.97-1.00	0.67	0.22-0.96	0.99	0.97-1.00
Opiate agonists/ partial agonists	162	98	166	94	0.67	0.58-0.76	0.81	0.71-0.88	0.87	0.81-0.92	0.78	0.68-0.85	0.89	0.83-0.93
Antimigraine agents	258	2	256	4	0.66	0.23-1.00	0.50	0.07-0.93	1.00	0.99-1.00	1.00	0.16-1.00	0.99	0.97-1.00
Evaluation time widow #2: past year use of prescribed analgesics														
Nonspecific NSAIDs	204	56	101	159	0.15	0.07-0.23	0.28	0.21-0.36	0.89	0.81-0.94	0.80	0.68-0.90	0.44	0.37-0.51
COX-2-selective NSAIDs	229	31	206	54	0.63	0.50-0.75	0.54	0.40-0.67	0.99	0.97-1.00	0.94	0.79-0.99	0.89	0.84-0.93
Anticonvulsants	143	117	104	156	0.59	0.49-0.68	0.70	0.61-0.76	0.92	0.85-0.97	0.93	0.87-0.97	0.67	0.59-0.75
Antidepressants	148	112	127	133	0.70	0.62-0.79	0.77	0.69-0.84	0.93	0.87-0.97	0.92	0.85-0.96	0.80	0.72-0.86
Skeletal muscle relaxants	228	32	215	45	0.62	0.49-0.76	0.58	0.42-0.72	0.97	0.94-0.99	0.81	0.64-0.93	0.92	0.87-0.95
Synthetic cannabinoids	249	11	247	13	0.83	0.66-0.99	0.77	0.46-0.95	1.00	0.98-1.00	0.91	0.59-1.00	0.99	0.97-1.00
Opiate agonists/ partial agonists	138	122	107	153	0.57	0.47-0.66	0.71	0.63-0.78	0.87	0.80-0.93	0.89	0.82-0.94	0.68	0.60-0.76
Antimigraine agents	258	2	251	9	0.36	0.00-0.72	0.22	0.03-0.60	1.00	0.99-1.00	1.00	0.16-1.00	0.97	0.94-0.99

Less than 5% of observations were missing (n = 12).

*Classification of pain medications reported by QPR patients was based on American Hospital Formulary Service (AHFS) classification.

†On the basis of the commonly used benchmarks of Landis and Koch,[32] κ < 0.2 = poor agreement, 0.2-0.4 = fair agreement, 0.41-0.6 = moderate agreement, 0.61-0.8 = good agreement, >0.8 = very good/almost perfect agreement.

95% CI indicates 95% confidence interval; COX-2, cyclooxygenase-2; NPV, negative predictive value; NSAIDs, nonsteroidal anti-inflammatory drugs; PPV, positive predictive value; QPR, Quebec Pain Registry; RAMQ, Régie de l'assurance maladie du Québec.

(1.47%), headaches/migraines (1.47%), and rheumatoid arthritis (0.37%), were lower in our study than those reported in the general population and in primary care settings.[36,37] This is because of the fact that these conditions are usually managed by general practitioners or specialists who do not refer these patients to multidisciplinary pain treatment clinics. In contrast, more than half of our sample (57.9%) had neuropathic pain based on their results on the DN4 scale.[33] In the general population, the prevalence of neuropathic pain ranges between 6.9% and 9.8%,[38,39,40] supporting an overrepresentation of this condition among patients referred to pain clinics.

Accuracy of current self-reported medication use versus prescription claims databases or medical records has been previously assessed by other research groups in various populations. In agreement with our results, Solomon et al[19] found that self-reported current medication use was accurate among patients with rheumatoid arthritis (κ across different medications = 0.71 to 0.96). However, these authors evaluated disease-modifying antirheumatic drugs and oral glucocorticoids, making comparisons with our study difficult. Other studies involved persons with schizophrenia,[20] community-dwelling elderly patients treated by general practitionners,[18] and the general population.[21] In these studies, accuracy of current self-reported analgesics use varied according to the study population and the type of medication.

Our study showed that the accuracy of the past year self-reported prescribed analgesic use among QPR patients was somewhat lower but only for certain classes of medication—that is, anticonvulsants (κ = 0.59), opiate agonists/partial agonists/antagonists (κ = 0.57), and antimigraine agents (κ = 0.36). On the basis of the commonly used benchmarks of Landis and Koch,[32] a κ > 0.6 was needed to conclude to "good" agreement between the information recorded in the QPR and the RAMQ databases. However, κ coefficient benchmarks can be viewed as somewhat arbitrary.[41] For example, Svanholm et al[42]

propose to rather use a $\kappa > 0.5$. If we had adopted this cut-off point, we would have concluded to "good" agreement for the use of 2 of the 3 classes of medication mentioned above.

Specificity values were consistently high among all therapeutic classes of medication used in the past 12 months suggesting that residual nonconcordance between self-report and prescription claims can be explained by underreporting rather than overreporting of medication use. This tendency was expected as longer medication utilization time windows increases the possibility of recall bias.[18,19,43] It is possible that participants forgot to report medications that were either not taken regularly (ie, taken as needed) or taken for a short period of time only. Another aspect to take into account is that prescription claims may not reflect actual medication intake, and this may have contributed to some discrepancies in the data recorded in the QPR and our reference standard (the RAMQ database). Despite the fact that individuals covered by the RAMQ insurance plan have to pay part of their medication to be reimbursed for the rest, they may have filled a prescription for a pain medication but took only 1 dose and forgot to report its use. Finally, it is important to point out that the RAMQ insurance plan does not reimburse all prescribed analgesic medications. Because covered medications change over time and some noncovered medications can be reimbursed under certain conditions or special circumstances, it was not possible to exclude noncovered prescribed analgesic medications from our analysis. This may explain part of the variability in the data recorded in the QPR and RAMQ databases.

In both evaluation time windows (current and past year), agreement between nonspecific NSAIDs use as recorded in the QPR and in the RAMQ prescription claims was poor. This was expected because over-the-counter nonspecific NSAIDs medications does not appear in the RAMQ prescription claims database unless it is written on the physician's prescription. Surprisingly, the prevalence of use of this type of medication was found to be higher in the RAMQ prescription claims than in the QPR database (Table 3) suggesting that participants tended to underreport the use of nonspecific NSAIDs whether it was prescribed or not, probably for the same reasons as those mentioned above.

There are limitations associated with our study that require comment. As mentioned earlier, our sample for the validation study excluded persons who had a private medication insurance plan. Previous studies in the province of Quebec (Canada)[44] and elsewhere in North America[45–47] have shown that patients covered by public medication insurance plan have a significantly lower socioeconomic status than those insured by a private plan. Although this difference does not affect the internal validity of our study, it may limit its generalizability. However, contradictory results have been published regarding the presence of an association between socioeconomic status and accuracy of self-reported medication use.[21,48,49] Another important aspect to keep in mind is that our study population was composed of individuals who were referred to tertiary care multidisciplinary pain treatment clinics. Therefore, our results cannot be generalized to other populations of patients with CP such as those who are treated in primary care settings. However, patients who are seen in multidisciplinary pain clinics is a population where polypharmacy is likely to be more prevalent given the complexity and the severity of their condition. As a greater number of prescribed chronic use of drugs was shown to be a predictor of recall bias in self-reported medication use,[50] it is tempting to speculate that the accuracy of patient-reported data regarding pain medication use would be even better in the general population of CP patients than in those who are treated in tertiary care facilities.

Despite the limitations of our study, it can be concluded that QPR patients were accurate in the type of medication they reported using for their pain, and this was true for a variety of therapeutic classes. As quality of research data is essential to insure internal validity of studies conducted among CP patients, our results are of substantial relevance for future pharmacoepidemiological research endeavors. Patient registries such as the QPR can provide a useful tool to conduct "real-world" studies on the pharmacological treatment of CP. Contrary to the RAMQ and other types of administrative databases, the QPR include a rich, comprehensive, and longitudinal data set collected in a well-defined cohort of CP patients on a variety of sociodemographic and biopsychosocial variables, which are themselves measured with identical clinical descriptors, uniform self-reported outcomes, and common validated/standardized measurement tools. This type of patient registry provides a unique opportunity to explore research questions and hypotheses regarding various aspects of CP and its management, including issues such as the impacts of pharmacological pain treatments on patient outcomes (eg, pain severity, emotional well-being, quality of life) in the "real-world" clinical setting.

ACKNOWLEDGMENTS

The authors would like to thank all the QPR research team members at the Centre hospitalier de l'Université de Montréal (CHUM), at McGill University Health Centre (MUHC), and at Centre hospitalier universitaire de Sherbrooke (CHUS). They also thank the QPR patients who consented to participate in this study.

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