



Comparison of Older and Younger Patients Referred to a Non-interventional Community Pain Clinic in the Greater Toronto Area (GTA)

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ABSTRACT

Aim: To compare demographic and pain characteristics of older (≥ 65) vs younger (< 65) chronic non-cancer pain patients referred to a community pain clinic in the Greater Toronto Area (GTA), Ontario, Canada.

Methods: This is a retrospective study of 644 consecutive new patients with pain seen during 2016–2017 (older group $n = 126$; younger group $n = 518$). Demographic characteristics, Brief Pain Inventory pain ratings, and diagnosis were obtained using retrospective chart review. Patients were classified into group I (pure biomedical pathology), group II (mixed

biomedical causes and psychological factors) and group III (no detectable physical pathology but psychological factors were considered important).

Results: Older patients comprised 19.6% of the overall population (higher than the average GTA older population). Regarding older vs younger group, male/female ratio was 1:1.3 vs 1:1.7 respectively, while 71% of the older patients were foreign born vs 37% of the younger group ($p < 0.001$). Low back was the most prevalent pain site for both groups; 70% of the older patients were classified as group I vs 35% of the younger patients ($p < 0.0001$), and only 6% as group III (vs 18% of the younger population, $p < 0.05$).

Conclusion: The study points to considerable differences between younger and older patients with pain with the latter presenting with significant biomedical pathology but lesser psychopathology. The results are comparable to those obtained from a university pain clinic as well as a rural Northern Ontario clinic. Implications of the study for planning of pain care are discussed.

Keywords: Chronic pain; Older adults; Pain disorder; Community-based practice

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Key Summary Points

The present study is one of the very few Canadian studies providing detailed data on younger and older patients with chronic pain in a community pain clinic sample.

Older patients with chronic pain differ in a number of important domains from younger patients with chronic pain.

Older patients with chronic pain in this community sample are more likely present with greater physical and less psychopathology as opposed to younger patients.

INTRODUCTION

Chronic pain defined as pain that lasts for 3–6 months or more than expected [1] is a significant public health problem among many older adults, often associated with worse health due to greater functional impairment, disability, depression, impaired sleep, and social isolation [2]. It also poses a significant economic burden on healthcare.

As the population of developed countries ages, there has been an increase in the prevalence of conditions associated with persistent pain across settings of care [3]. Approximately one in three Canadians 65 years of age and older lives with chronic pain [4, 5]. Specifically, as many as 50% of older adults who live in the community and 45–80% of those in nursing homes suffer from chronic pain [6]. Given the aging population in Canada, we can expect a larger proportion of Canadians to be living with chronic pain in the coming years. Although chronic pain can have significant impact on the lives of persons of any age, it may have a greater effect on older patients than on younger adults [7]. Managing pain in older adults is challenging because of multiple factors such as frequent comorbid conditions, tendency of the elderly to

under-report pain or not ask for analgesia, physicians' reluctance to prescribe opioids because of concern with addiction and negative side effects to cite a few [8].

Some authors contend that geriatric patients with chronic pain are distinctly "different" from younger patients with chronic pain [9], although others disagree [10]. It should be noted that strong individual differences exist in pain experiences and effects [11], while pain burden is not evenly distributed throughout life stages. Studies indeed show that with age there is an increased risk of various types of chronic pain (e.g. musculoskeletal system) [3]. However, a previous study of ours from a tertiary care pain clinic [12] showed that despite significant biomedical problems (concordant with the patients' presentation), older patients (over 65 years of age) have significantly fewer psychological factors contributing to disability when compared to younger patients with pain. Multiple factors may account for those findings including differences in adaptation pathways to chronic pain.

Although the existing literature has identified demographic differences in pain presentation of older patients in tertiary care pain centres [12], less is known about the demographics, pain characteristics and diagnostic profiles of older patients in community pain clinics. Routinely collected health data provide an opportunity to assist in healthcare decisions, filling gaps in knowledge, and changing the way institutions and governance work. It is now more crucial than ever, given stark increase in older populations with specialized needs in Canada and other developed nations [3, 7], to have continuous clinical information about pain sufferers to ensure their safety, effectiveness, and value, as well as to advance our understanding and promote overall population and individual pain care [3] and, in particular, care for older individuals.

Therefore, the primary aim of the present study is to describe the landscape of older vs younger patients with pain in a community-based pain clinic. This study, therefore, compares demographics, pain characteristics and diagnostic classification profile of older (≥ 65) vs younger (< 65) patients with chronic non-

cancer pain referred to the Pain and Wellness Centre (PWC), a non-interventional community pain clinic located 45 km north of Toronto, in the Greater Toronto Area (GTA) encompassing 7124 km² with a population of 6.4 million (in 2016) [13].

METHODS

Design and Sample

This retrospective study was conducted on 644 consecutive patients with chronic non-cancer pain who were referred by family doctors or specialists to the PWC for a medical pain consultation during a 24-month period (January 2016–December 2017). The study population was divided into two age groups: older population (≥ 65 years of age, $n = 126$) and younger population (< 65 years of age, $n = 518$). For this study, the older population (≥ 65) included individuals aged 65 and over and the younger population (< 65) included individuals 64 years old and up to but not more than 6 months. All patients filled out the standard PWC intake form which included a consent form (acceptance of the patient to use his or her data anonymously in aggregate format for research purposes) witnessed by administrative staff. This study was approved by the Research Ethics Board of University of Toronto (protocol number 36903).

Data Collection

Data were collected using standardized intake questionnaires completed by the patients at the time of their original consultation, as well as through retrospective chart review. These data included demographics (age, sex, place of birth, education, marital status, employment status) and pain characteristics (site, primary pain complaint, pain ratings on the Brief Pain Inventory, duration of pain). “Place or country of birth” was used as identifier and patients were classified as Canadian born (CB) and foreign born (FB).

Diagnosis was extracted from chart review by experienced PWC clinicians (through the

detailed original consultation, review of records sent at time of referral, as well as additional reports and findings of investigations collected during follow-up appointments). Pain mechanisms were obtained from a detailed list of biomedical disorders established during data compilation, i.e. neuropathic pain (NP) disorders (including brain and spinal cord conditions, radiculopathies, neuropathies, etc.), nociceptive pain (NC) disorders (including osteoarthritis, soft tissue injuries, nociceptive visceral pains, etc.) and mixed conditions (neuropathic and nociceptive pain disorders).

Furthermore, the study population was divided into three diagnostic groups as follows: Group I patients have a significant biomedical condition(s) considered responsible for pain symptoms and disability while psychological influences are considered absent or minor. Group II patients have a combination of biomedical condition(s) and psychological/psychosocial factors affecting pain perception and disability. Group III patients lack findings consistent with biomedical conditions, present with high levels of emotional distress, disability and pain severity, and psychological/psychosocial factors are considered prominent in their presentation. The aforementioned categorization is based on our established clinical practice as follows: all patients are seen in our centre referred by their primary care physicians or specialists and are evaluated extensively by two pain team members, who obtain an explicit history regarding their pain problems, as well as detailed medical, surgical, psychiatric, and psychosocial history; review past and current medications and treatments received to date; as well as all imaging, medical reports and surgical consultations forwarded with the referral. The history is followed by detailed neuro-musculoskeletal examination, and if needed additional investigations. A group III diagnosis is not a diagnosis of exclusion, i.e. made solely on the basis of lack of detectable biomedical pathology (with current means available), but is based on clinical expert judgement that takes in account all sources of information (history, physical findings, behavioural observations, review of records, and laboratory/medical/surgical reports and findings). The aforementioned diagnostic classification has

been explicitly described [12] and extensively used in previous publications from our group [12, 14–18]. A very small number of patients in both age groups in the present study were not given a diagnostic categorization because of lack of final diagnosis (e.g. investigations were not completed and/or the patient failed to show for follow-up).

In regard to opioid use, based on daily total morphine equivalent dosage (MED), the patients were classified as low opioid users (LOU) ≤ 90 mg/day of morphine and high opioid users (HOU) ≥ 90 mg/day of morphine. The cut-off point of 90 mg/day between the two opioid user groups was defined by the 2017 Canadian guidelines for safe and effective use of opioids for chronic non-cancer pain [19]. Mean dose and range were calculated only for preparations taken regularly that could be converted to morphine equivalents. Additionally, current cannabis use was recorded at entry point.

Statistical Analysis

Statistical analysis was performed using SPSS (Statistical Package for the Social Sciences, version 16.0). Pearson's chi-square test or goodness-of-fit test or chi-square test for independence was used to analyse contingency of demographic variables, pain characteristics, opioid users and diagnosis data between the elderly and younger population. Student's *t* test was used to analyse pain ratings and opioid consumption between the elderly and younger subjects and binomial proportions were used for comparing individual variables between both the groups. At a 95% confidence interval, statistical significance was shown by using two-sided *p* value of less than 0.05. When the denominator is different as a result of missing data, the exact number will be indicated in brackets.

RESULTS

General Demographic Data

Notably, women outnumbered men in both groups, but more so in the younger population

(M/F ratio 1:1.3 for the over 65 group versus M/F ratio 1:1.7 for the younger group). The older group comprised 19.6% of this cohort. Younger patients were more likely to be Canadian born, single, and more educated, with half of them holding some form of employment, while three quarters of the older patients were retirees. The older population was largely foreign born (71%) as compared to the younger population (37% foreign born). Younger patients had twice as many emergency visits (18%) as compared to older patients (9%), and twice as many allied health encounters (probably because they were more likely to have extended health benefits). Demographic characteristics for both groups are summarized in Table 1.

Duration, Severity and Factors Associated with Onset of Pain Problem

The numerical pain rating for the patients' average pain at the time of the consultation (7/10) and the BPI pain interference score (47 ± 14 and 49 ± 14) were no different between the older and younger groups. However, duration of pain complaints was much longer for the older population (127 months vs 78 months; $p < 0.001$). For almost half of the older patients (56%), disease states (osteoarthritis, diabetic neuropathy, degenerative disc disease, spinal stenosis, etc.) were the primary cause for their pain problems, as opposed to car accidents which were the leading cause of chronic pain for the younger group. Low back pain was by far the most prevalent site of pain for both groups. Low back pain as the only site of pain was present in 25% of the older population as compared to 13% in younger population ($p < 0.001$). Multi-site pain (four or more sites) was more prevalent in the older group (37%) as compared to 21% of the younger cohort. The results are shown in Table 2.

Diagnostic Categorization

The majority of the older patients (70%, $n = 85$) were classified as group I (with primarily biomedical pathology) as compared to 35% of

Table 1 Demographic characteristics: older vs younger patients

Demographic variables	Older patients ≥ 65 years	Younger patients < 65 years	<i>p</i> value
Gender	<i>N</i> = 126	<i>N</i> = 518	
Male	54 (43)	192 (37)	0.2301
Female	72 (57)	326 (63)	
Male/female	1:1.3	1:1.7	
Age (mean ± std)	74 ± 6	45 ± 12	0.001
Country of birth	<i>N</i> = 126	<i>N</i> = 517	
Canadian born	36 (29)	328 (63)	0.001
Foreign born	90 (71)	189 (37)	
Marital status (<i>N</i> = 637)	<i>N</i> = 125	<i>N</i> = 512	
Single	3 (2)	131 (26)	
Divorced	13 (10)	47 (9)	
Widow	28 (22)	6 (1)	
Common law	0	24 (5)	
Married	81 (65)	293 (57)	
Separated	0	11 (2)	
Level of education (<i>N</i> = 608)	<i>N</i> = 115	<i>N</i> = 493	
Elementary school/grade school or less	37 (32)	17 (3)	0.001
High school	37 (32)	136 (28)	
College	24 (21)	201 (41)	
University	9 (8)	75 (15)	
Postgraduate	5 (4)	52 (11)	
Trade school	3 (3)	12 (2)	
Work status (<i>N</i> = 632)	<i>N</i> = 121	<i>N</i> = 511	
Full time work	4 (3)	171 (33)	0.001
Part time work	1 (1)	39 (8)	
Unable to work	9 (7)	208 (41)	
Retired (not working)	90 (74)	18 (4)	
Self employed	7 (6)	49 (10)	
Others	10 (8)	26 (5)	
Number of years to immigration (years) (mean ± std)	50 ± 12	26 ± 15	
Extended health benefits			
Yes	27 (21)	198 (38)	0.0001

Table 1 continued

Demographic variables	Older patients \geq 65 years	Younger patients < 65 years	<i>p</i> value
In past 2 years, visited following health professionals	<i>N</i> = 126	<i>N</i> = 518	
Emergency	11 (9)	94 (18)	0.0001
Physiotherapist	45 (36)	271 (52)	0.0008
Chiropractor	31 (25)	195 (38)	0.0059
Naturopathic doctor	4 (3)	33 (6)	0.1675
Massage therapist	28 (22)	206 (40)	0.0009
Psychologist	5 (4)	91 (18)	0.0001
Pain doctor	14 (11)	60 (12)	0.8807

Data are presented as *n* (%) unless otherwise stated

the younger patients ($p < 0.0001$). To the contrary, only 6% of the older patients were classified into group III (with prominent psychological factors and little detectable pathology) vs 18% of the younger population ($p < 0.05$) (see Fig. 1). The primary pain mechanism in groups I and II (with major or some biomedical pathology respectively) was nociceptive in 64% ($n = 266$) of older patients and 52% ($n = 60$) of younger. In regards to sex, women were overrepresented in diagnostic groups II and III (both associated with the presence of psychological factors) in both older and younger subgroups.

Opioids and Cannabis Use

Of the total sample, 44% of older patients and 32% of younger patients were consuming opioids prescribed by their family physicians or specialists. No statistical significance was observed in high opioid users between the older and younger population. MED could be calculated for 120/167 younger opioid users and 42/55 older opioid users. There was no difference in means and ranges between younger and older low and high opioid users. The results are detailed in Table 3. Current cannabis use was

minimal in the older patients (5%, $n = 6$) vs the younger population (18%, $n = 92$) (< 0.0001). Details are presented in Table 3.

DISCUSSION

To summarize, our community-based chronic pain clinic pragmatic data show that patients > 65 years of age accounted for 19.6% of all new patients; women outnumbered men in both groups; three quarters of the > 65 were retirees; with older patients twice as likely to be foreign born, married or widowed and less educated. Additionally, the older group had much greater duration of pain complaints and primarily biomedical pathology with the majority classified as group I. Low back pain was the single complaint in a quarter of the older patients, while one third of them suffered with multisite pain (four or more sites). Despite the duration of symptoms and the biomedical nature of their pain generators, the older patients displayed much less psychopathology as the primary driver of their complaints (group III 6% vs 18% in the younger patients) and visited emergency much less frequently than the younger group (9% vs 18%).

Table 2 Pain characteristics: older vs younger patients

Pain characteristics	Older ≥ 65 years	Younger < 65 years	<i>P</i> value
Primary pain cause	<i>N</i> = 126	<i>N</i> = 518	
Category of pain cause (<i>N</i> = 644)	<i>N</i> (%)	<i>N</i> (%)	
Disease	71 (56)	103 (20)	0.00001
Spontaneous	19 (15)	113 (22)	
Trauma	32 (25)	270 (52)	0.00001
MVA	12 (10)	168 (32)	0.001
Work related accident	9 (7)	32 (6)	
Sport injury	1 (1)	21 (4)	
Slip and fall	9 (7)	20 (4)	
Surgery	0	15 (3)	
Other trauma	1 (1)	14 (3)	
> 1 cause	3 (2)	30 (6)	
Duration of pain (months) (mean ± std)	127 ± 179	78 ± 101	0.001
Pain rating on BPI scale			
Pain on the AVERAGE (mean ± std)	7 ± 2	7 ± 2	
Pain category	<i>N</i> = 120	<i>N</i> = 497	
Mild	4 (3)	27 (5)	
Moderate	45 (38)	179 (36)	
Severe	71 (59)	291 (59)	
BPI pain interference score (mean ± std)	47 ± 14	49 ± 14	
Pain body map site (<i>N</i> = 643)	<i>N</i> = 126	<i>N</i> = 517	
LBP presence in all groups	79 (62)	344 (66)	
Single site LBP	32 (25)	69 (13)	0.001
Non-single-site LBP	47 (37)	275 (53)	
Multi-site (4 or more sites including CWP)	27 (21)	193 (37)	

Data are presented as *n* (%) unless otherwise stated

An older study of ours [20] demonstrated much higher levels of biomedical pathology in foreign born specifically of European origin as compared to Canadian born (therefore most of them were classified as group I). The primary area in which PWC operates has a very large

population of Italians (by birth or ethnic identification) based on 2016 Census subdivisions (31.1%) or 2016 Census federal electoral districts with 10% or more of population (53.5%) [21]. On the basis of the aforementioned, we submit that cultural factors are an additional

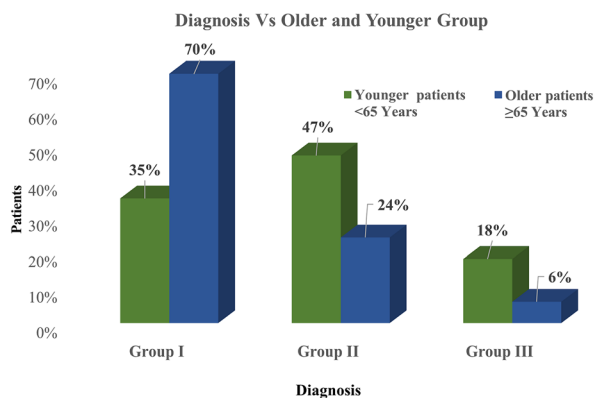


Fig. 1 Diagnostic group vs older and younger group

variable contributing to differences between the older group (with predominance of foreign born) vs the younger group (with predominance of Canadian born).

Similarly, the greater prevalence of psychological factors in the younger patients may be the driving force behind their earlier appearance to our pain clinic and other clinics [12] despite the relative lack of discernible physical pathology.

Our findings in a GTA community pain clinic are strikingly similar to the characteristics of older patients documented in a Canadian university pain clinic in downtown Toronto [12, 20], and a Northern Ontario rural pain clinic [22] (as well as personal communication with Dr. Hadi Shojaei, July 24, 2022).

Based on the different studies cited above, while it is unlikely that our results are the product of chance, there are certain limitations that remain, particularly because our present data are collected from one site. A further limitation relates to diagnostic accuracy with the categorization we have been using regarding the different diagnostic groups. While this grouping has been used in many publications, formal studies have not been conducted; therefore, one cannot be totally certain that there is consistency with this process.

While opioid use was not significantly different between the groups (44% of older patients vs 32% of younger patients), cannabis use was minimal in the older patients (5%) as compared to 18% of the younger population. Both numbers are very small, but the data were

collected prior to cannabis legalization in Canada in 2018. On the basis of our current clinical experience, a lot more older patients have come forward asking for referral to a cannabis clinic since 2018 (though anecdotally in our practice the dropout rate is very high as a result of costs, ineffectiveness and/or side effects).

Review of 2021 Census data shows a significant increase in the population > 65 years of age (e.g. from 13.2% in 2007 to 18.1% in 2021 in Ontario). The different GTA regions served by PWC report proportions of older than 65 years of age individuals that may be lower than the Ontario average, e.g. Toronto (17.1%), Peel (14.7%), York (17%), Halton (16%), and Durham (15.9%) [13].

Much older literature reported under-representation of older populations in pain clinics [23]. However, newer studies clearly point to increasing proportions of older patients in pain clinics resulting from increasing numbers of older patients with pain and better knowledge about the existence of pain clinics. The proportion of older individuals in our clinic, as a matter of fact, clearly exceeds the numbers reported in the major GTA regions served by PWC. We suggest that the great numbers and the rather late presentation of older patients for the first time to our clinic are due to multiple reasons alone or in combination, namely:

1. Increasing numbers of biomedical conditions with advancing age (e.g. spinal and joint degenerative changes, post herpetic neuralgia, neuropathies, etc.), necessitating expert pain management
2. Increased pain threshold and other physiological changes with advancing age that dull pain and delay referrals [24, 25]
3. Failure of previous treatments in interventional clinics and local physiotherapy clinics
4. Referring physician's request for consultation to elucidate diagnosis and offer management as many older patients with significant biomedical pain conditions are considered inoperable

Table 3 Opioid and cannabis use: older vs younger patients

Opioid intake	Younger patients ≤ 65 years N = 518	Older patients < 65 years N = 126
Opioid users	167 (32)	55 (44)
Non opioid users	351 (68)	71 (56)
Opioid user categories ^a	N = 120	N = 42
HOU (≥ 90 mg)	22 (18)	7 (17)
LOU (< 90 mg)	98 (82)	35 (83)
AMED (mean ± std)	64 ± 87 (3–300)	57 ± 74 (2–510)
HOU (AMED)	224	195
HOU range	90–510 mg	90–300 mg
LOU (AMED)	30	30
LOU range	3–83 mg	2–83 mg
Cannabis use ^b		
Currently using marijuana		
Yes	92 (18)	6 (5)
Cannabis use	N = 81	N = 7
Prescribed	36 (44)	5 (71)
Non-prescribed	38 (47)	2 (29)
Both	7 (9)	0
Reason for use	N = 92	N = 5
Pain	60 (65)	3 (50)
Sleep	41 (44)	0
Increase appetite	12 (13)	0
Relaxation	34 (37)	0
Recreation	8 (9)	2

Data are presented as *n* (%) unless otherwise stated

AMED average total morphine equivalent dose, HOU high opioid user, LOU low opioid user

^aThis category represents patients whose opioids could be converted to morphine equivalents

^bNote that data were collected before the 2018 cannabis legalization in Canada

5. Older patients' stoic attitude, acceptance of pain as a "natural consequence of aging", or lower levels of entitlement [26] that delay referrals (though stoicism has been considered not simply generational, but also a sociocultural phenomenon [27])
6. Older adults' lesser predisposition to somatoform disorders (consistent with our own data), which again delay seeking care [28]
7. Family members or caregivers advocating referral specifically to our clinic

8. In general, the reputation of our clinic that ended up attracting patients from a much greater area than the GTA

We stress that only the last two variables may be specific to our clinic, while the first six are applicable to the older populations in general.

CONCLUSIONS

Our current observations regarding older vs younger patients in a community pain clinic serving the area of GTA, are very similar to the data we collected almost 15 years ago from a hospital-based academic pain clinic in downtown Toronto [12], in terms of preponderance of female patients, foreign born, retirees, length of pain complaints, biomedical pain generators and limited psychopathology, in patients > 65 years of age. The only differences we observed between the two studies related to opioid use and amount (with much greater consumption of opioids by patients in the older study); however, one has to take into account the fact that during the last 15 years much has changed in terms of opioid prescribing in general, which may be reflected in our present study. As we have stated before [12], patients older than 65 years of age who attend our pain clinic are indeed “a bird of a different colour”.

Limitations of the study include population selection bias and relatively small sample size. However, our data may indeed have a wider application in other pain clinic samples as our present study and other studies point out. Nevertheless, we are cognizant of the fact that there are significant differences between different pain clinics such as philosophies, diagnostic classification, treatment approaches, specialization of providers, distance from the clinic, preferences of patients, specific populations that may be attracted to a clinic, etc.

The results of the study are important for other pain clinics as well as policymakers and administrators, in regard to planning resources and related funding for different pain subgroups (of note, in Ontario, the largest province in Canada, the provincial Ministry of Health

provides funding to a number of pain clinics). For example, younger patients with less biomedical pathology and more psychological factors contributing to the presentation are more in need of interdisciplinary multimodal pain management, while pain treatment providers will need to be cognizant of legal issues pertaining to motor vehicle accidents (the leading cause of pain in our younger group). Alternatively, older patients are more in need of biomedical approaches to pain management (e.g. medications, injections or surgeries), translation services (given the high numbers of foreign born) and other (medical) services to which pain clinics may refer such as psychogeriatrics, diabetes management, etc.

Further larger pragmatic studies should, in particular, examine older patients' acceptance of diagnosis, compliance, outcomes of treatments, ethno-cultural factors, as well older persons' beliefs and attitudes in regard to illness in general and pain in particular.

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Compliance with Ethics Guidelines. The study was reviewed and approved by the University of Toronto Human Ethics Research Committee (Protocol# 36903). This study was performed in accordance with the declaration of Helsinki and its later amendments.

Data Availability. Data will not be available in a public repository due to the patients' privacy and confidentiality issue.

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