ORIGINAL REPORT

PREVALENCE OF LONG-TERM OPIOID THERAPY IN A CHRONIC NON-CANCER PAIN POPULATION ATTENDING A UNIVERSITY-BASED TERTIARY PAIN CLINIC IN SWEDEN: A CROSS-SECTIONAL STUDY

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Background: **Opioid therapy is a common treatment for chronic pain, despite accumulating evidence regarding harm and a lack of data to support the efficacy of long-term treatment.**

The prevalence of opioid therapy in Swedish patients with chronic non-cancer pain is unknown. The aim of this study was to assess a short-term period prevalence of prescribed opioid-use and long-term opioid therapy in a population with complex chronic non-cancer pain.

Methods: **The study population comprised 1,613 patients with chronic non-cancer pain referred to a university-based tertiary pain clinic in Sweden during 2015–17. Data from a 360-day period prior to consultation were extracted from the Swedish Quality Registry for Pain Rehabilitation (SQRP) and Swedish Prescribed Drug Register (SPDR). Milligram morphine equivalents per day (MME/day) for dispensed opioids were analysed for a 90-day period preceding consultation, and long-term opioid therapy was determined for the entire 360-day period.**

Results: **The 90-day prevalence was 38% (95% confidence interval (95% CI) 36.0–40.8%) and 360-day prevalence was 22.3% (*n*=360, 95% CI 20.4–24.4%).**

Conclusion: **Prescribing rates of opioids in a Swedish population with complex non-cancer chronic pain were high; 2 in 5 patients were dispensed an opioid within a 90-day period prior to consultation.**

Key words: pain measurement; analgesics; opioid; cross-sectional studies

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LAY ABSTRACT

Opioid therapy is a common treatment for chronic pain, despite accumulating evidence regarding harm and a lack of data to support the efficacy of long-term treatment. The use of opioid treatments in Swedish patients with chronic non-cancer pain is unknown. Hence, the current study aimed to assess the frequency of opioid use in a population with complex chronic non-cancer pain. The study population comprised 1,613 patients referred to a Swedish specialized pain rehabilitation unit during 2015–17. Data for 1 year prior to assessment were extracted from the Swedish Quality Registry for Pain Rehabilitation and Swedish Prescribed Drug Register. Milligram morphine equivalents per day for dispensed opioids were analysed for short-term prevalence and long-term opioid therapy. In conclusion, the prescribing rates of opioids in a Swedish population with complex non-cancer chronic pain were high; 2 in 5 patients were dispensed an opioid within a 90-day period prior to consultation.

Chronic pain is common in the general population in Europe and causes suffering at an individual level, as well as a burden to society in terms of loss of labour capacity (1). Most people recover or cope adequately with pain, but a proportion develop chronic pain that is difficult to manage (2). Typically, healthcare providers aim for pain relief by attempting diverse pharmacological treatments. Prescribing opioids may be tempting for both clinicians and patients, as opioids may provide immediate pain relief for different chronic pain conditions in the short-term (3, 4). However, concerns have been raised about the use of opioids in treating chronic non-cancer pain. In 2018 the International Association for the Study of Pain (IASP) published a position statement on opioids recommending caution, as there is a lack of evidence of efficacy and safety regarding long-term opioid therapy (LTOT) in this population (5–7).

Increased all-cause mortality among patients exposed to opioids in a chronic non-cancer pain setting has been reported in Germany (8, 9), the UK (10) and the USA (11). In addition, the serious side-effects of opioids, and other neuroadaptations to the drugs compromise both the efficacy and the safety of LTOT (12). An approach

to improving quality of life using a behavioural and physical treatment strategy, such as interdisciplinary pain rehabilitation programmes, has been preferred (7).

Patterns of prescription of opioids in chronic pain settings vary between countries. Many western countries have problems with excessive prescription and use of opioids in chronic pain conditions. In Sweden, at a national level, the number of individuals with opioid prescriptions remained steady from 2000 to 2018. However, prescription patterns show an increase in oxycodone, and a decrease in tramadol and codeine/morphine prescriptions. The morphine equivalent dose during this time-span has, however, not increased (13). Then again, in the southern-most county of Sweden, where Lund University hospital is situated, prescriptions of opioids to a population with hip and/or knee osteoarthritis 2014–15 were reported as being alarmingly high, with prescription rates of 23.7%, with at least 1 opioid dispensation during a 12-month period. This was a 2-fold dispensation rate compared with a population without hip and/or knee osteoarthritis. Certain populations or medical conditions with chronic pain may thus be exposed to opioid treatments to a high extent (14).

The aim of this study was to investigate the prescription patterns of opioids among patients with complex chronic pain conditions attending a multidisciplinary assessment at a university-based tertiary pain clinic in Sweden during 2015–17. Questions addressed were: *(i)* What was the 90-day period prevalence of dispensed opioids in this chronic pain population 3 months prior to assessment? *(ii)* What was the prevalence of LTOT during a 360-day period prior to evaluation? *(iii)* Were there differences in odds ratios (OR) between patients exposed to opioids and those who were non-exposed, according to self-reported pain intensity, quality of life, anxiety/depression and demographic data, referral sources or utilization of healthcare?

METHODS

Setting and population

This cross-sectional study was performed at a tertiary pain clinic at Lund University hospital, Sweden, during the period 1 June 2015 to 31 December 2017. The unit is a tertiary care centre for interdisciplinary assessment and treatment of chronic non-cancer pain in accordance with national and international guidelines, aiming to reduce secondary effects of chronic pain (15). In addition to assessments, rehabilitation is offered as exercise therapy or group-based interdisciplinary multimodal pain rehabilitation programmes (IMMRPs) (16, 17).

The population comprised 1,613 patients who had completed a patient report outcome questionnaire provided by the Swedish Quality Registry for Pain Rehabilitation (SQRP) prior to an interdisciplinary assessment of their pain condition (Fig. 1). The assessment of each patient included consultations with a physician, a physiotherapist and a psychologist, and a sum-up meeting in which an individual rehabilitation plan was presented by the team for discussion with the patient. Pain, in this population, was non-cancer chronic pain with a large impact on patients' daily life.

Swedish Quality Registry for Pain Rehabilitation

Patients referred for interdisciplinary assessment at almost all specialized pain clinics performing IMMRPs in Sweden report to the national registry SQRP prior to their first consultation and at follow-up after performed IMMRP. The report to SQRP entails reported outcome measurements in validated questionnaires of health-related domains as well as socioeconomic and sociodemographic variables, and is used by the clinical staff in the interdisciplinary assessment. Data are registered according to routines laid out by SQRP and described elsewhere (18, 19).

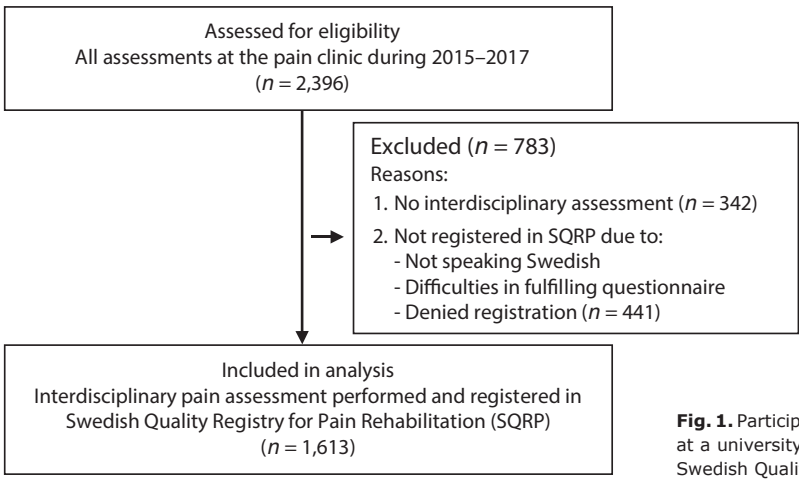

Fig. 1. Participants with chronic non-cancer pain assessed for eligibility at a university-based tertiary pain clinic in Sweden 2015–17. SQRP: Swedish Quality Registry for Pain Rehabilitation.

In more detail, the SQRP includes self-reported sociodemographic factors (sex, age, country of birth and educational level), an 11-point numerical pain rating-scale (NRPS) rating average pain intensity during the preceding 7 days, and number of visits to physicians due to pain during the year prior to the first visit. Data concerning the source of referral and diagnoses relevant for rehabilitation are reported by staff (19). Self-reports of validated instruments, i.e. Hospital Anxiety and Depression Scale (HADS) (20), EuroQoL 5D (EQ-5D) (21), Tampa Scale for Kinesiophobia (TSK) (22), Chronic Pain Acceptance Questionnaire (CPAQ-8) (23) and Rand 36 (24), included in the SQPR, were used in the current study. The subscale of physical functioning in Rand 36 was used as this aspect was not covered by any other instrument used.

Ninety-day period prevalence of opioid-use and long-term opioid therapy

Dispensed opioids used for pain management with Anatomical Therapeutic Chemical- code (ATC-code) N02A were analysed. Opioids used for addiction treatment (ATC-code N07BC) were not included (25). Opioid use was calculated and graded in accordance with established categories that reflect the risk of overdose and recommended doses for pain management (5). Data concerning dispensing of opioids were retrieved from the Swedish Prescribed Drug Register (SPDR), and reflected prescriptions of ATC N02A, for the 360 days preceding completion of the questionnaires from SQRP. Period prevalence of daily opioid-use was calculated for the period of 90 days preceding completion of the questionnaires from SQRP. The sum of dispensed tablets was divided by 90 to obtain the average daily dose for the period. Milligram morphine equivalents per day (MME/day) were calculated using a conversion-factor, and categorized (5, 26). The constructed categories of opioid-use were:

- No dispensed opioids
- Daily dose of opioids $>0<20$ MME/day
- Daily dose of opioids $\geq 20<50$ MME/day
- Daily dose of opioids $\geq 50<90$ MME/day
- Daily dose of opioids ≥ 90 MME/day

LTOT was defined to exist when there was at least 1 opioid-prescription, dichotomized as existing or not existing, dispensed per 90 days in 3 consecutive 90-day periods 360 days prior to reporting to SQRP (8, 27). The definition of LTOT may vary in different publications; the current study used the German definition of a prolonged period over 9 months to define the LTOT population (26, 27).

Exposure to other prescribed drugs

Data retrieved from SPDR also included benzodiazepine (ATC-codes N05BA, N05CD, N05CF) and gabapentin and pregabalin (ATC-codes N03X12 and N03AX16). Dichotomization into exposed or not exposed to the drug during the 90-day period prior to reporting to SQRP was performed.

Statistical analysis

The SQRP and SPDR databases were linked to a working sheet used for statistical analysis. The population was defined from participation in SQRP prior to interdisciplinary assessment in the specified timeframe. Data cleaning regarding SPDR was performed by programming timeframes of 360 days before the date of reporting to SQRP and the dispensed drugs were then linked to SQRP.

Continuous data were presented by means ± standard deviation (SD), 95% confidence interval (95% CI) and ordinal data in numbers, median and interquartile range. If there are an even number of values in the vector, the function returns the average of the 2 medians. The 90-day period-prevalence of dispensed opioids is reported as crude numbers and percentages with 95% CI calculated on Open Epi, using Wald (normal approximation) (28).

Dichotomization of opioid exposure 90 days prior to the health survey was performed when calculating OR in a logistic regression model for opioid exposure as outcome variable in relation to independent variables.

Sex disaggregated analysis was performed according to the SAGER guidelines (29).

Statistical analyses were performed with SAS software, version 9.3 (SAS Institute Inc.) as well as SPSS for Windows version 25.0 (https://www.ibm.com/docs/en/spss-statistics). Throughout the paper, a 2-sided test resulting in p-value less than 0.05 ($p<0.05$) was considered significant.

Ethics

The study followed the principles of the Declaration of Helsinki and was approved by the Regional Ethical Review Board in Lund, Sweden (diary number 2017/873). Ethical approval was required to extract data from SQRP. The data collected to the SQRP were a part of the ongoing quality control of clinical care activities and stored with the consent of the National Swedish Data Inspection Agency. Informed consent is considered sufficient to be registered in the SQRP.

RESULTS

The process of allocation of participants is described in Fig. 1. The 1,613 patients included in the analysis are described in Table I. Most participants were

Table I. Opioid use in prevalence period of 90 days prior to assessment at Department of Pain Rehabilitation in Lund, Sweden, June 2015 to December 2017, *n* = 1613. Background variables in relation to opioid exposure, expressed in milligram morphine equivalent dose/day (MME/day), based on Swedish drug register of the National Board of Health and Welfare, self-report and physician's assessment

Background variables	All patients *n* = 1613	No opioids *n* = 1,004	> 0 < 20 MME/day *n* = 408	≥ 20 < 50 MME/day *n* = 124	≥ 50 < 90 MME/day *n* = 36	≥ 90 MME/day *n* = 41
Sex, *n* (%)						
Female	1238 (77)	806 (80)	307 (75)	79 (64)	20 (56)	26 (63)
Age, mean (SD)	43 (11.1)	43 (11.1)	42 (11.6)	43 (10.5)	43 (10.1)	47 (10.0)
Referral unit, *n* (%)						
Primary care	1239 (77)	784 (78)	313 (77)	95(77)	18 (50)	29 (71)
Specialist care	264 (16)	147 (15)	68 (17)	21(17)	17 (47)	11(27)
Other	110 (7)	73 (7)	27(7)	8 (7)	1 (3)	1 (2)
Country of birth, *n* (%)						
Sweden	1227 (76)	738 (74)	318 (79)	104 (85)	32 (89)	35 (85)
Scandinavia	40 (2)	25 (3)	11 (3)	3 (2)	1 (3)	0 (0)
Europe	148 (9)	107 (11)	29 (7)	10 (8)	1 (3)	1 (3)
Outside Europe	189 (12)	130 (13)	46 (11)	6 (5)	2 (6)	5 (12)
Level of education, *n* (%)						
Elementary school (0–9 years)	170 (11)	106 (11)	40 (10)	15 (12)	2 (6)	7 (17)
High school (10–12 years)	788 (49)	469 (47)	223 (55)	57 (46)	20 (56)	19 (46)
University (> 12 years)	514 (32)	346 (34)	108 (26)	41 (33)	8 (22)	11 (27)
Seeking healthcare last year, *n* (%)						
0–1 times	272 (17)	203 (20)	46 (11)	16 (13)	2 (6)	5 (12)
2–3 times	759 (47)	455 (45)	197 (48)	57 (46)	27 (75)	23 (56)
4 times or more	565 (35)	337 (34)	159 (39)	49 (40)	7 (19)	13 (32)
Category of pain diagnosed, *n* (%)						
Widespread	917 (57)	609 (61))	208 (51)	56 (45)	22 (61)	22 (54)
Muscular-skeletal	474 (29)	261 (26)	144 (35)	50 (40)	6 (17)	13 (32)
Neuropathic	77 (5)	49 (5)	12 (3)	8 (6)	5 (14)	3 (7)
Abdominal or visceral	31 (2)	15 (1)	11(3)	3 (2)	2 (6)	0 (0)
Headache	44 (3)	29 (3)	8(2)	4 (3)	1 (2)	2 (5)
Other	70 (4)	31 (3)	22 (5)	3 (2)	0 (0)	1 (2)
Psychiatric co-morbidity, *n* (%)	401 (25)	239 (24)	106 (26)	39 (31)	6 (17)	11 (27)
Referred to multimodal pain rehabilitation programme, *n* (%)	553 (34)	363 (36)	130 (32)	46 (37)	9 (25)	5 (12)
Days with chronic pain, median (IQR)	1254 (577–3303)	1282 (611–3440)	1064 (502–3069)	1476 (425–2740)	1480 (519–3763)	1550 (869–3354)
Numeric rating of average pain last week in numbers 0–10, median (IQR)	7 (6–8)	7 (6–8)	8 (7–8)	8 (7–9)	7 (7–9)	8 (6.5–8.5)
Numbers of pain sites, median (IQR)	14 (8–22)	15 (9–23)	14 (8–20)	12 (6–19)	11.5 (4.5–19)	13 (8–22.5)
HADS, median (IQR)						
Anxiety,	10 (6–14)	10 (6–13)	10.5 (7–14)	11 (6–14)	9 (4–13)	8 (4–12.5)
Depression,	10 (6–13)	9 (6–13)	10(7–13)	12 (7–15)	11 (7–14)	9 (5.5–13)
Chronic Pain Acceptance Questionnaire (CPAQ-8), median (IQR)	18 (12–24)	19 (13–25)	17 (12–23)	14 (10–20)	13 (7.25–23.75)	19.5 (12–23)
Tampa-scale for kinesiophobia (TSK), median (IQR)	41 (34–48)	40 (33–47.25)	42 (35–48)	42 (34–50)	38.5(33–48.75)	43.5 (33.75–49)
EQ5D–index, median (IQR)	0.10 (–0.02–0.52)	0.16 (–0.01–0.62)	0.09 (–0.02–0.28)	0.03 (–0.08–0.16)	0.03 (–0.08–0.16)	0.09 (–0.02–0.22)
Rand 36, physical function, median (IQR)	45 (30–65)	50 (30–65)	45 (30–60)	40 (25–60)	40 (25–60)	35 (20–58.75)
Benzodiazepine, *n* (%)	341 (21)	230 (23)	73 (18)	28 (23)	5 (14)	5 (12)
Pregabalin, *n* (%)	103 (6)	65 (7)	27 (7)	7 (6)	1 (3)	3 (7)
Gabapentin, *n* (%)	165 (10)	117 (12)	28 (7)	14 (11)	3 (8)	3 (7)

Data presented per column in absolute numbers with percentage, mean with standard deviation or median with interquartile range.

HADS: Hospital Anxiety and Depression Scale.

Missing values: Country of birth *n* = 9, Level of education *n* = 141, Seeking healthcare last year *n* = 17, Days with chronic pain *n* = 370, Numerical rating of average pain last week *n* = 14, Numbers of pain sites *n* = 9, HAD anxiety *n* = 15, HAD depression *n* = 16, Chronic Pain Acceptance Questionnaire (CPAQ)-8 *n* = 94, Tampa Scale for Kinesiophobia (TSK) *n* = 102, EuroQoL 5D (EQ-5D)-index *n* = 39, Rand 36 physical function *n* = 21.

female (77%), born in Sweden (76%), and referred from primary care (77%). Reported average pain intensity during the preceding 7 days to completion of the questionnaire was 7 (6–8) (NRPS). EQ-5D index mean was 0.10 and HADS depression/anxiety median score was 10, where 8–10 points indicate possible cases. Moreover, the most frequent diagnosis was widespread pain. Severe chronic pain conditions impairing quality of life is most frequently seen in this population.

Ninety-day period prevalence of dispensed opioids

Dispensing of opioids 90 days prior to questionnaire was found in 619 of the 1,613 included patients. A further 10 patients had dispensed opioids, but without

Table II. Long-term opioid therapy (LTOT) prevalence in a 360-day period among 1,613 patients prior to survey and the following assessment for chronic non-cancer pain at Lund University Hospital Pain Clinic, Sweden

	First 90-day period	Second 90-day period	Third 90-day period	Fourth 90 -day period	Long-term opioid therapy (LTOT)[a]
Dispensed opioids *n* (%)	619* (38.4)	535 (33.2)	532 (33.0)	480 (29.8)	360 (22.3)
Proportions 95% confidence interval[b]	36.0–40.8	30.9–35.5	30.7–35.3	27.5–32.0	20.4–24.4

*Ten patients are added where dispensed opioids did not have defined daily dose opioid in Swedish Prescribed Drug Register.
[a]LTOT defined by at least 1 dispensing of opioid (ATC-group N02A) per quarter in at least 3 connected quarters (1 quarter=3 months) over the 12-month period.
[b]Calculated on website: Open Epi Wald (Normal approximation).

defined daily dose (DDD) in the SPDR for the MME/day calculation (25). The period prevalence of opioid dispensing in this population was thus 38% (95% CI 36.0–40.8) with medium and high doses of opioids expressed as MME/day > 50/day found in 12.6 % (see Tables I and II).

Prevalence of long-term opioid therapy

The LTOT prevalence was 22.3% (n = 360 with 95% CI 20.4–24.4) (Table II). Estimation of opioid dose was performed by calculation of MME/day in the first 90-day period. Presented in categories, as in Tables I and II, it revealed 10.6% of the population as having dispensed opioids in high doses > 90 MME/day in the population with LTOT (Table III).

Differences in relation to opioid exposure

OR estimations show increased risk for opioid exposure among men, with OR 1.43 (1.10 - 1.85) in an adjusted model (Table IV). Furthermore, opioid-exposed individuals reported low quality of life, more depressive symptoms, less anxiety, more visits to the doctor during the last year and were, to a greater extent, referred from specialized hospital care units and, to a lesser extent, from a primary care unit.

Due to these results, a sex disaggregated analysis was performed. A consistent finding throughout stratified analysis was reporting of lower levels of quality of life in EQ-5D-index for both sexes. Men reported lower levels of anxiety and more depressive symptoms, while this was not found among women. Instead, women exposed to opioids were referred from specialist clinics (i.e. not primary care) to a higher extent. In the sex stratified analysis, multiple visits to a doctor were not a significant finding.

Age did not differ in relation to opioid exposure, in either the aggregated or sex-disaggregated analyses. Further comparisons of histograms were performed and showed a similar pattern in both groups, thus confirming the finding.

DISCUSSION

In this study, evaluating opioid use in a Swedish population with severe chronic non-cancer, 2 out of 5 patients referred to the specialist unit were found to have at least 1 opioid dispensation during the 90-day period preceding first contact. Furthermore, 1 in 5 patients were dispensed opioid prescriptions as long-term therapy, of whom 1 in 10 received precariously high doses (> 90 MME/day) of opioids. OR from multiple regression analysis, sex aggregated and disaggregated, revealed that opioids were more frequently dispensed to male patients and patients reporting poor health-related quality of life.

In a comparable chronic non-cancer pain population (529 patients) from a multicentre study in 4 chronic pain clinics in Portugal, opioid medication was dispensed to a much higher extent, i.e. 59.7% vs 38% in the current study. In the Portuguese sample, no differences between opioid users and non-users were found regarding anxiety/depression, measured as confirmed conditions, the opioid treatment being more common among older and less-educated patients (30). Another Swedish sample of a similar population shows similar prescription rates. As in the current study, a selection of patients with higher rated psychological distress and pain and reporting low quality of life was seen among opioid-exposed patients (31). Opioid therapy in patients with chronic pain in Sweden seems to be less prevalent, but may indicate an adverse selection of patients receiving opioid prescriptions, as more depressive symptoms are present in opioid-exposed patients

Table III. Long-term opioid therapy (LTOT) in 360 patients the last year and opioid-doses in categories calculated 90 days prior to health survey in a Swedish chronic non-cancer pain population

	No opioids dispensed first 90-day period	> 0 < 20 MME/day*	≥ 20 < 50 MME/day*	≥ 50 < 90 MME/day*	≥ 90 MME/day*
Patients with LTOT the last year, *n* (%)	21 (5.8)	170 (47.2)	95 (26.4)	30 (8.3)	38 (10.6)
Proportions 95% confidence interval	3.4–8.3	42.1–52.4	21.8–30.9	5.5–11.2	7.4–13.7

MME/day: milligram morphine equivalent dose per day.
[a]Calculated on website: Open Epi Wald (normal approximation).
*For 6 patients opioids were prescribed as LTOT, but defined daily dose (DDD) was missing in the Swedish Prescribed Drug Register and it was not possible to calculate MME/day.

Table IV. Opioid-exposure in relation to background variables, pain rating, emotional distress, perceived health, use of healthcare, referral units and multi-disciplinary pain rehabilitation in a Swedish chronic pain population

Variable	Ref.	Unadjusted model OR (95% CI)	Adjusted model OR (95% CI)
Pain (0–10)		1.01 (0.99–1.03)	1.01 (0.98–1.03)
Sex	Female	**1.53 (1.19–1.96)**	**1.43 (1.10–1.85)**
Education		0.86 (0.73–1.02)	0.86 (0.72–1.03)
Age		1.00 (0.99–1.01)	0.99 (0.98–1.00)
HADS, anxiety			**0.96 (0.94–0.99)**
HADS, depression			**1.04 (1.00[a]–1.07)**
EQ-5D-index			**0.45 (0.30–0.68)**
Psychiatric co-morbidity	No		1.07 (0.82–1.41)
Specialist care	Primary care		**1.38 (1.03–1.86)**
Other care settings	Primary care		0.98 (0.63–1.52)
Doctor visits year prior to assessment[b]			**1.22 (1.04–1.43)**
Pain assessment only	Multi-disciplinary rehabilitation		1.06 (0.83–1.34)

HADS: Hospital Anxiety and Depression Scale; OR: odds ratio; 95% CI: 95% confidence interval; Ref: references. Unadjusted and adjusted odds ratio and 95% CI for opioid exposure. **Bold** numbers are statistically significant ($p < 0.05$).

[a]1.00 = 1.003

[b]0–1 visit, 2–3 visits or 4 or more visits.

than among the non-exposed. Adverse selection in opioid prescription has been described, where subjects with mental health problems (contrary to recommendations) are more frequently prescribed opioids. In the same population, a doubled risk of transitioning into long-term opioid use was also noted in subjects with mental health problems (32). Furthermore, another study reported that patients with depression continue opioid use at lower pain intensity levels and higher levels of physical function than patients without depression (33). Hence, the lower prescription rates of opioids in the current Swedish study may still be problematic, as the selection of patients seems to favour patients who are more prone to problematic use.

The higher prescription rate among men is puzzling. Can it reflect sex differences in coping with chronic pain? Do men cope through use of opioids to a higher degree and women through acceptance and behavioural change? Results regarding chronic pain are mixed. Reports in different populations contradicting the current study exist; where opioid prescriptions are more prevalent among females (30, 34, 35). Significant differences in opioid exposure between the sexes in a Swedish chronic pain population have not been reported previously (31). Other differences in a Swedish chronic pain population attributed to sex have been demonstrated, showing higher participation in behavioural interdisciplinary treatment for women and males experiencing more mood disturbance, lower activity level and kinesiophobia (36, 37). This pattern was observed in an American population with chronic pain and opioid misuse, where males were experiencing more pain-related fear/avoidance while reporting equal pain-rating (38). As 1 of the Swedish studies examined a large proportion of the total chronic pain population in tertiary care centres providing IMMRP, these results may be considered as true for the population in the current study (36). On the other hand, international investigations on a similar sample of individuals on LTOT report females as having a less favourable pain status, which includes pain rating and pain interference (35).

The prevalence of LTOT in a Swedish population with moderate to severe chronic non-cancer pain in tertiary pain clinic has been reported previously and showed a higher extent of daily opioid use (30% vs 22.3%) compared with the current study. The measurements of opioid use differ and may, to some extent, contribute to differences (31). In another population-based study from southern Sweden 2014–15, prevalence of opioid prescriptions during a 1-year period was 10% in the general population compared with 25% in patients with hip and/or knee osteoarthritis. (14). Osteoarthritis is a common source for chronic non-cancer pain. These and other results indicate that chronic pain, rather than the condition of osteoarthritis, amplifies the risk of opioid exposure from healthcare professionals, as 38% of patients were exposed to opioids in the current study sample.

Opioid treatment for chronic non-cancer pain was common in the current study; although not as prominent as in other western countries. Comparisons are made either on a national level, including all prescribed opioids, or within specified populations, as in the current study. On a national level the UK, France, and Germany prescribe 2–5 times the defined daily dose (DDD) of opioids in comparison with Sweden and Denmark (39). Possibly, this is due to a gradual increase in prescription rates in these countries, whereas in Sweden there has been no increase in prescription rates over the last 20 years (13). The European opioid prescription rates are thus not insignificant, but are by far surpassed by the rates in the USA. For instance, a German population study revealed that 1.3% of the general population had LTOT, whereas LTOT in a US sample of a general population was estimated to be 3–4% (27).

In 10.6% of the current study sample prescribed LTOT, the daily dose of prescribed opioids was >90 MME/day. Opioid intake at this level is known to substantially increase the risk of adverse events (6). These potentially harmful dosages seem to be less prevalent than in the German population sample, where 15.5% of LTOT received >90 MME/day (27). Younger patients were not prescribed opioids to a higher extent in our sample, in contrast to the German sample, which might indicate a precaution taken concerning the risk-factor of young age for developing substance abuse in the current study sample. Physicians in Sweden thus seem to be aware of hazards with LTOT.

Prescribing opioids to patients with chronic non-cancer pain is a complex and difficult task. In national and international guidelines, the prescribing doctor is made aware of risks associated with initiating long-term therapies for patients with substance-use disorder, psychiatric co-morbidity, young or old age, and pain-conditions that present widespread pain as fibromyalgia (5). These guidelines were published after the timeline of the current study. At that time, opioid prescription for patients with chronic pain was considered as a treatment option when other treatments failed. The IASP 2018 statement on opioids is now more precise about LTOT, i.e. the disadvantages of the therapy are greater than its uncertain positive impact on chronic pain. An updated cross-sectional study from 2018 onwards would be of interest to understand whether prescribing patterns are changing according to recommendations.

Strengths and weaknesses

This rather small population consists of patients in a geographically restricted area reporting severe chronic pain with interference in daily living and were selected through referrals. Even though patterns of opioid prescriptions in Sweden have some regional variations, the pattern of prescribed opioids in the general population in Scandinavia during the period 2006–18 showed no significant difference compared with Sweden as a whole. It has not been investigated to what extent LTOT was prescribed, and thus it is not known if any regional differences are present in that aspect (13).

Large-scale evaluation on a national level of SQRP has been performed, where results from NRPS, HADS, EQ-5D were similar to the current study population, which strengthens the likelihood of similar results on a national level. The total population of patients recruited to SQRP yearly from all over Sweden is approximately 5,000, and the large-scale evaluation included almost 40,000 patients examined over the period 2008–16 (36, 40).

The number of patients in interdisciplinary assessment who are not reported to SQRP is unknown. However, as only 2 patients were denied registration during 2019, the number of excluded patients is assumed to be very low.

Data for dispensed drugs on an individual level are derived from the Swedish drug register of the National Board of Health and Welfare, where all dispensed prescribed drugs are registered. The reliability of prescribed drugs at an individual level is thus good. Statistics are based on statutory reporting from pharmacies. Data collection is, to a vast extent, automated, where data are extracted from administrative systems.

As the data reflect dispensed drugs rather than consumed drugs, this may result in an overestimation of consumption of opioids on each occasional prescription. Also, the MME/day is calculated over 90 days, as prescriptions in Sweden should not exceed this timeframe. Summing up defined daily dose of opioids and dividing during a time-frame in relation to a specific date, as we did, may lead to both an overestimation and an underestimation of the MME/day. Furthermore, there are no data on patients' access to illicit drugs in this sample.

Clinical and research implications

Chronic pain patients with severe pain in Sweden constitute a population highly exposed to opioid drugs, without evidence supporting opioid use to be an efficient and safe treatment. The IASP statement on opioids 2018 outlines the need for treatment approaches other than pharmacological ones, focusing instead on behavioural and physical treatments to improve quality of life and participation in social and occupational activities (7). Research focusing on opioid exposure in populations should consider sex disaggregated analysis, as mixed results exist in international samples if males are more prone to be prescribed opioids.

Conclusion

In a Swedish chronic non-cancer pain population reporting moderate to severe pain during 2015–17 the prevalence of opioid dispensing is moderate compared with other western countries; however, opioid dispensing is common, considering present day clinical guidelines, as 2 in 5 patients were dispensed an opioid in a 90-day period prior to assessment for their chronic non-cancer pain condition. With these prevalence numbers, opioids for moderate to severe chronic non-cancer pain seem to be habitually prescribed.

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