Opioid prescribing in general practice: use of a two-stage review tool to identify and assess high-dose prescribing

British Journal of Pain
2018, Vol 12(3) 171–182
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DOI: 10.1177/2049463717742420
journals.sagepub.com/home/bjp

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Abstract

Background: Long-term opioid analgesic prescribing in chronic non-cancer pain (CNCP) is a growing worldwide concern. This has implications for optimal healthcare management in general and chronic pain management specifically. This work documents the development of a review tool and its use in the South West of England in a locality that showed opioid prescribing levels higher than surrounding localities.

Methods: An electronic tool which enabled calculation of total prescribed morphine-equivalent doses was developed to allow general practitioners (GPs) to undertake reviews of CNCP patients. This tool was used to assess strong opioid prescribing over a 3-month period at every GP practice (n=41) in the locality. Every prescription for morphine, oxycodone, pethidine and fentanyl during this period was included. Aspects assessed included drug(s) prescribed, dose prescribed, whether tramadol was prescribed concurrently, whether the drugs were potentially being overused and/or whether the patient was in palliative care. Patients prescribed over 120 mg morphine equivalent per day were reviewed in greater depth, as this is an indication for specialist input.

Results: In total, 1881 patients received a prescription in the assessment period. Morphine was the most commonly prescribed drug (n=847). In all, 363 CNCP patients were prescribed a dose equal to or above 120 mg morphine a day, with a maximum morphine-equivalent dose of 890 mg being prescribed. Over 11% (n=211) of patients were concurrently prescribed tramadol. The most frequently cited reason for prescription of high-dose opioids was found to be a musculoskeletal pain of the back, neck, joints or limbs. The care of 85 specific CNCP patients was reviewed and optimised.

Discussion: No published work to date has documented such an in-depth analysis of primary-care opioid analgesic prescribing utilising prescriber data. Assessing total-dose morphine-equivalent prescribing using this method provides valuable insights into the potential need for urgent medication review. The tool developed may be of value to other GP practices following validation.

Keywords

Analgesia, chronic pain, opioid analgesics, pain, pain management, primary health care

Introduction

Background

Long-term opioid prescribing for the management of chronic pain conditions has increased substantially in the last 20 years,^{1–4} with one paper suggesting that global opioid prescribing has increased 30-fold over the period 1980–2010.⁵ Chronic opioid therapy (COT) prescribing has resulted in an epidemic of

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opioid-induced morbidity and mortality, particularly in the United States.^{6–8} A notable editorial published immediately prior to this work attested to the national UK concern associated with opioid prescribing.⁹

Although COT prescribing guidelines exist for clinicians using opioids in the United Kingdom,^{10,11} long-term efficacy studies have shown limited benefit in pain reduction, reducing disability or improving return to work in patients receiving COT.^{11–13}

The evidence for chronic opioid prescribing for pain relief is losing traction, particularly for conditions such as chronic lower back pain,^{14,15} fibromyalgia^{16,17} and also when the risks of misuse and dependence are considered.^{17–20}

Furthermore, evidence suggests that most COT prescribing occurs in primary-care settings²¹ and management of this prescribing can become an issue for some primary-care physicians.^{21,22} It has been suggested that primary-care physicians can get into difficulty/struggle managing these complex patients,²³ and as a result, opioid prescribing may spiral out of control. The National Pain Audit (2011) revealed a high need for pain services by general practitioners (GPs), and it has been identified that there is a need for ongoing pain management education.²⁴

In 2015, Song and Foell²⁵ identified that regular medication reviews and opioid contracts (an agreement between prescriber and patient which explicitly state how prescribing will occur, particularly dose increases and prescription issuance) can be implemented when problems arise. They noted that a system needs to be in place to identify high-risk prescriptions in primary care.

A prescribing evaluation was proposed to explore and characterise the prescribing practice of GPs of strong opioids using an electronic evaluation tool. This article will discuss the findings of the opioid prescribing evaluation conducted by a Medicines Optimisation Team.

The locality of interest

In the United Kingdom, all prescribing data are available for assessment through the 'electronic prescribing analysis and costing' (ePACT) system. Regional UK National Health Service (NHS) data show significant regional variation in opioid prescribing (ePACT.net/Health and Social Care Information Centre (HSCIC) data). In 2012, the investigation location, a city on the South West Peninsula of England, was shown by these data to be an area with higher opioid prescribing in comparison to the majority of other localities in the south of England. The health of people in the city was classed as 'generally worse than the England average' by Public Health

England (PHE)²⁶ with deprivation higher and life expectancy for both men and women lower than the average for England.

ePACT/HSCIC prescribing data can provide a wealth of information, but it is not able to provide specific information to understand prescribing at the patient level. This lack of detail is a significant limitation of using high-level data to understand prescribing. For example, neither the number of prescriptions nor the dosage of the prescribed medicines for any particular patient is available. For example, from prescribing data, 99 prescriptions over a 3-month period could be single prescriptions for 99 separate individuals or one repeat prescription per month for 33 individuals. This is a significant limitation of national prescribing data. Furthermore, there are no insights into the indication for the prescription, the treatment duration or if there is any specialist involvement. The only way to capture this information is to collect information directly from general practice prescribing systems.

Aims

The aims of this project were as follows:

1. To explore and review primary-care high-dose opioid prescribing practice by GPs.
2. To record any changes in prescribing interventions that may have been prompted by the review.

Context of study

This evaluation study formed part of the annual work stream conducted by the Medicines Optimisation Team for the locality in the South West England. The Medicines Optimisation Team has an annual scheme which financially rewards GP practices for completion of set work projects, and GP practices received payment for completion of the study data collection under the NHS Local Enhanced Service agreement between GP practices and the Clinical Commissioning Group (CCG). As this study was an evaluation of prescribing, research ethics was not needed; however, the sharing of data is approved and conducted under NHS clinical audit rules, and each practice has a written 'Data Sharing Agreement' with the Medicines Optimisation Team. In years prior to this work being undertaken, opioid prescribing had been monitored and reviewed in a number of ways. In addition, GPs from each of the study practices had attended a number of educational sessions presented by both the pharmacists of the Medicines Optimisation Team and the consultants of the local pain clinic. These

sessions covered various aspects of opioid use including safe prescribing, referral indications and risks including possible hyperalgesia and/or dependence.

Methods

This was a two-stage prescribing evaluation of high-dose opioid prescribing. The first stage was to identify and review the prescribing of all patient-prescribed opioids over a 3-month period. Prescribing details for the patients were input into an electronic tool specifically devised for this project, and a sub-cohort of patients was identified: patients who had been prescribed a dose equal to or greater than 120 mg of morphine. At the second stage, the patient notes of these high-dose patients were reviewed in detail by a GP using prompts in the review tool and using skills learned during education sessions previously held by the Medicines Optimisation Team.

Data collection

A search was conducted of all prescribing in the prior 3 months to identify every instance where an opioid had been prescribed. All patient records at each practice were included in the search, including those of deceased patients (deceased patients were included to capture prescribing of opioids to patients who had died recently and may have been prescribed opioids leading up to their death). All patients identified were reviewed using the electronic data collection tool.

Drugs of interest

The study investigated the prescribing of potent (UK classification 'Schedule 2') opioid drugs only – morphine, fentanyl, pethidine and oxycodone specifically because of the higher risk of adverse effects and misuse.²⁷

A specific focus would be placed on 'high doses' which were defined as agents prescribed in a dose equivalent to 120 mg or above of morphine daily. This dose (120 mg) is accepted as the threshold for 'high-dose' opioids,^{28,29} and the British Pain Society (BPS) states that chronic non-cancer pain (CNCP) patients reaching this level of opioid therapy should be referred to a specialist pain management centre for review.^{10,11}

Tramadol co-prescribing was also included in the review process because the equivalence of tramadol to morphine (ranging from one-tenth to one-quarter that of morphine^{30,31}) means that the overall morphine-equivalent intake can be raised significantly by concurrent tramadol use. Tramadol misuse was a

Table 1. Opioid equivalence factors used in this project to calculate morphine equivalence.

Drug	Multiplication factor used to calculate morphine equivalence ^a
Oral morphine liquid	1
Morphine (all other forms)	1
Oxycodone (all forms)	2
Pethidine (all forms)	0.2
Fentanyl (patch)	3.6
Tramadol	0.1

^aThese factors should not be used for clinical dose calculations or conversions.

concern in the years leading up to this work, and these concerns lead to its reclassifications as a Schedule 3 Controlled Drug in the United Kingdom in June 2014.³²

Data collection tool

A key feature of this evaluation study was the data collection tool used. A MicrosoftTM Office[®] 2010 Excel[®] template was produced that had the ability to automatically calculate the morphine equivalence of any of the opioids included in this work that was prescribed to a patient. This enabled identification of patients prescribed a dose of 120 mg morphine or equivalent for an in-depth (Stage 2) review. Morphine equivalence conversion data were assessed from a number of sources, including the locality 'Joint Formulary', UK Medicines Information (UKMi),³¹ BPS,¹⁰ (the Selby & York Palliative Care Team & Pharmacy Group palliative care guidance³³ and online opioid conversion tools.³⁴ At the planning stage, it was decided that the conversion figures used would be taken from the low end of the equivalence ranges. The reasoning for this is that it would reduce the number of patients identified (limiting the number of 'false positives'). It was considered that highlighting too many patient concerns would dilute the impact of this work, and by focussing on the higher dose patients, those of greater risk would receive more attention. The conversion figures (Table 1) were then used to allow the tool to calculate the equivalent morphine dose for each opioid prescribed. The factors used in this study should not be used for clinical dose calculations or conversions.

The tool was designed to review the use of oral morphine liquid (Oramorph[®]) separately from other morphine preparations as it was considered important to understand the different patterns of use; particularly, the use of oral morphine liquid on a 'when required' basis. Currently, in the United Kingdom,

Figure 1. Overview of the patient selection and review process.

Table 2. Information collected at Stage 1 of the study.

Found by search of computer system and entered by Medicines Optimisation Team	Patient medical record reviewed and data entered by GP
Patient ID	Drug(s) prescribed (confirmed by entering a dose into the table)
Date of birth	Whether tramadol was prescribed (Y/N) and if so, the total daily dose
Usual GP seen by the patient	If the patient was being treated under palliative care (Y/N)
	Whether the prescribing record indicated possible overuse of the drug(s) prescribed (Y/N)

GP: general practitioner.

the oral liquid 10 mg/5 mL formulation of morphine is classed (Schedule 5) which places it alongside weak opioids including codeine, dihydrocodeine and products such as co-codamol (codeine and paracetamol combination tablets). The potency and the risk of misuse of morphine liquid is commonly overlooked and it has been suggested that this classification can lead to reduced consideration of risks when it is prescribed.^{35,36} As a liquid formulation, morphine will have a rapid onset of action resulting in a positive reinforcing effect,³⁷ particularly in comparison to a slow release preparation.

Exclusion criteria

Patients identified in the first phase of the evaluation who were receiving palliative care treatment were removed from the study cohort because opioid use would be under specialist supervision and time limited.

Review process

A GP from each participating study practice was nominated by the practice to be responsible for completing data entry into the assessment Excel® file. These GPs had attended the opioid and pain prescribing education sessions as previously described. The Medicines Optimisation Team sent the list of

identified patients in the assessment Excel file to the GP to review the prescribing.

During this study, the reviews undertaken were 'Level 2' reviews,^{38,39} which involve using full patient notes to review the care of a patient including all medication prescribed. This review and thorough consideration of the analgesic prescribing for each patient was one of the main aims of this work.

As documented in the 'Results section', some GPs proceeded to invite the patient in for a face-to-face (Level 3) review following this Level 2 review. GPs were not expected to conduct a face-to-face review, but some decided to do so following their findings during the Level 2 review. In addition, no prescribing changes were necessary, but it was expected that some changes might occur following the detailed review.

Cohort identification, data entry and collection

Stage 1 of the study involved identification of patients who had been prescribed one of the drugs in the 3 months prior to the data collection date. Staff from the medicines optimisation team completed a search of each participating GP practice prescribing system to find details of all prescribing. This ensured standardisation of searches and that all prescriptions were included in the data collection process. The data collection tool was then pre-populated with the

Local Enhanced Service 2012/2013:
Strong Opioid Review Audit
Part 1 Collation

Practice Name:
Name and role of person(s) completing the audit:

Date audit completed:

Please do not enter anything in these three columns as values are automatically calculated.

Patient details		Enter total daily dose (milligrams)				Dose in micrograms/hour	Is patient prescribed Tramadol Y/N	Total daily dose (milligrams)	Are any of these drugs prescribed for palliative care? Y/N	Is patient over using any of the drugs prescribed i.e. collecting prescriptions more than 5 months supply in 3 months or less? Y/N	Total Morphine equivalent dose		Please complete part 2 of audit if patient flagged in this column for review	Comments
GP	Patient ID	Patient DoB/Age	Oramorph ®	Is it prn? Y/N	Morphine	Oxycodone (including Targinact ®)	Pethidine	Fentanyl patches			Excluding Tramadol	Including Tramadol		
					10						10	10		
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Figure 2. Screenshot of the electronic tool for Stage 1 reviews.

Table 3. Data collected for patients prescribed over 120 mg morphine or equivalent (Stage 2).

Data collected	Recording method
Indication for the prescribing of opioids	(Free text answer)
Whether the patient was under the care of a specialist for this indication, and if so, which specialty	(Yes/no, specialty involved)
Whether hyperalgesia had previously been considered an issue in the care of the patient	(Yes/no)
Whether dependency had been considered in respect of the patient	(Yes/no)
What the long-term plan for the care of the patient was in respect of their pain	(Free text answer)
If any action had been taken as a result of auditing the patient record	(Free text answer)

patient names and sent electronically (via NHS.net secure email) to the nominated GP at each practice. Figure 1 provides an overview of the recruitment and review process.

For each patient, the row of data was completed regarding the prescribing. Data collected at Stage 1 is shown in Table 2.

Once data entry was completed for each patient, the spreadsheet processed the data to automatically calculate the total daily morphine equivalence for each patient. This was automated to prevent errors or data manipulation. If a patient was co-prescribed tramadol, the morphine equivalence was calculated and the total morphine-equivalent dose displayed both with and without tramadol, to show the contribution to the total from the tramadol.

At this stage, patients prescribed over a daily dose of 120 mg of morphine daily were highlighted for Stage 2 review (see screenshot in Figure 2).

The manual review of prescribing for each patient also prompted identification of those patients potentially overusing their prescribed medication. If, over the study period, a patient had received prescriptions for over 5 months' (140 days) supply as calculated by the prescribed dose for the 3-month period

(84 days), this was classed as 'overuse'. These patients were automatically flagged for review irrespective of the actual daily dose prescribed. Two or more early prescription issues over a 3-month period indicate regular early collection and possible overuse of opioids (one early prescription issue was accepted as it may have been necessary, for example, due to holiday).

The prescribing system identification (ID) and date of birth of patients for review in Stage 2 were automatically transferred to the second page of the tool. These details could not be edited or removed from the sheet to prevent data manipulation (removal of patients) during the review. The equivalent dose was also transferred across. The data captured in Stage 2 are listed in Table 3.

Figures 2 and 3 show the user interface of the data collection tool. Figure 2 shows the interface for Stage 1 reviews and includes examples of what users would see if they had a low-dose morphine patient (10 mg) and a high-dose morphine patient (150 mg).

Figure 3 shows the interface for Stage 2 reviews. The 150 mg dose morphine patient can be seen to have transferred across to this page, while the 10 mg (low dose) patient has not.

Figure 4. Age spread of patients reviewed at Stage 2 of the project (n=363).

Table 4. Number of patients prescribed the investigation drugs: morphine, morphine (as oral liquid), oxycodone, pethidine or fentanyl.

	Morphine	Morphine (as oral liquid) ^a	Morphine liquid as 'when required' dose	Oxycodone	Pethidine	Fentanyl	Tramadol
Number of patients prescribed drug ^b	847	682	592	302	8	192	211
Percentage of all patients (n=1881)	45.03%	36.26%	31.47%	16.06%	0.43%	10.21%	11.22%

The number of patients co-prescribed tramadol was also included.

^aDuring data collection, 'morphine' (as tablets, capsules etc.) was separated from morphine as 'oral liquid'.

^bThe total number of patient prescriptions for all drugs (morphine, morphine oral liquid, oxycodone, pethidine and fentanyl; n=2031) exceeds the number of patients (n=1881) as some patients were prescribed more than one drug.

Stage 2: reviews of high-dose opioid patients (n = 363)

Patients identified for review

In total, 363 patients were identified for Stage 2 review, representing 19.3% of the total (n=1881). The majority (332 (17.65%)) were reviewed because they were prescribed an opioid dose equivalent to or above 120mg morphine daily. In addition, a further 19 were reviewed due to meeting the overuse criteria as previously described. A total of 12 patients were identified as

'high-dose' after concurrent tramadol increased the total opioid equivalence of the primary opioid to above 120mg of morphine. Without the tramadol co-prescription, their daily morphine intake would have been less than 120mg.

Indications

A wide range of indications were recorded for the patients prescribed the high opioid doses, but pain relating to the musculoskeletal system including the back and neck were by far the most commonly

Table 5. Indications for prescribing high dose morphine (or equivalent).

Indication	Number of patients	
Back/neck pain	144	
Joint/limb pain	121	
Nerve related pain	28	
Gastro-intestinal	24	
Fibromyalgia	12	
Bone specific	11	
Mental health related	11	
Post-amputation pain (includes acute post-amputation pain, phantom limb and stump pain)	10	
Cancer pain (not palliative)	9	
Skin-related pain (includes skin and soft tissue infections)	8	
Complex regional pain syndrome	7	
Heart related	3	
Other (one instance reported)	32	Includes pain attributed to chronic kidney disease, hepatitis C, migraine, type 2 diabetes, Parkinson's disease
Blank/unclear	30	
'Pain' (undefined)	17	

recorded. There were 32 singularly reported causes of pain covering a wide range of conditions, which are illustrated in Table 5.

Patients under specialist care

Involvement of a specialist was recorded for 172 of the total 363 patients, with 179 recorded as not being under the care of a specialist and 12 patient review forms left blank. If it is assumed that the 12 blank forms were left blank on the basis that there was no specialist involved in the patient care, then over half of the patients ($n = 191$, 52.6%) identified as taking high-dose opioids by this study were not under the care of a specialist.

Specialists involved in the care of patients

Table 6 details the nature of the specialists recorded involved in the care of the patients on high-dose opioids. Of the 172 patients previously identified as under the care of a specialist, only 63 (36.6%; 17.4% of all patients reviewed in Stage 2) high-dose opioid patients were under the care of the local pain clinic. In total, there were found to be 180 instances of specialist involvement, with some patients under the care of multiple specialists. Not displayed in the table, nine specialties were involved in the care of two patients, including ENT, cardiology, colorectal and gynaecology. There were a further 13 specialties involved in

the care of a single patient (including addictions, dermatology, cardiology, mental health and Parkinson's disease).

Opioid-induced hyperalgesia

Hyperalgesia had been considered in 171 patients, but 169 patients were reported not to have had the possibility of hyperalgesia considered, or the clinician was confident that it was not an issue in the individual patient. The question was not answered for 23 patients.

Consideration of opioid dependency

Opioid dependency was declared to be an issue in 106 patients (29.2% of all patients reviewed at Stage 2).

Ongoing treatment

Table 7 records the ongoing treatment plan for the patient and any changes made by the GP following the prescribing review in Stage 2. The majority of patients, 196 (54.0%), were to continue on the analgesia, with a further three to continue with the expectation that the patient would progress into palliative care treatment. The ongoing treatment of 29 patients was dependent on advice from an external source (secondary-care specialist or investigation results). The process of the review resulted in the opioid dose of 57 patients being reduced and 28 patients being called in for review of their ongoing pain requirements. Seven

Table 6. Specialist involvement in the care of patients on high-dose morphine (or equivalent).

Specialty	Number of patients
Pain clinic	63
Rheumatology	32
Orthopaedics	17
Neurosurgery	10
Gastroenterology	6
Neurology	6
Psychiatry	4
Oncology	4
Hepatology	4
Respiratory	3

patients were recorded as having stopped the treatment or to be stopped. Two patients died during the study period.

Discussion

Concerns regarding the prescribing of opioids, particularly long-term prescribing of strong opioids, have been growing internationally in line with recorded increases in prescribing over the last two decades. This study pioneers a method for prescribers to review patients to highlight high-level opioid prescribing. It has the potential for use in the United Kingdom or internationally.

Analgesic prescribing for CNCP has previously been assessed through interviews with GPs⁴⁰ and by mail survey²³ but a review of the existing literature suggests that an investigation of this style, to assess primary-care opioid analgesic prescribing using practice prescribing records, has not previously been published.

There exist no equivalent data for comparison at this time; therefore, the data presented set a benchmark for further studies. Centrally available prescribing data (such as that from ePACT) enable the understanding of prescribing for a population, but it does not provide precise information on the actual number of patients prescribed the drugs during a specific timeframe. This is also a concern with respect to the required routine controlled drug monitoring following regulatory and legislative changes after the Shipman Inquiry.⁴¹ Monitoring prescription data at this level gives no information about prescribing and drug use at the individual patient level; this is a fundamental flaw. Only practice-level investigation can actually reveal concerning prescribing habits and was the basis for the development of this patient review process.

At the individual drug level, the results indicated positive changes in prescribing patterns, particularly in the low levels of pethidine use. Pethidine is no longer

recommended for routine use in pain relief.⁴² Morphine was by far the most commonly prescribed drug of the drugs investigated; however, whether this represents appropriate prescribing is unclear.

A lack of specialist input in high-dose prescribing was one of the most significant findings of this work. Despite local and national guidance stating the need for patients prescribed over 120 mg morphine equivalence per day to be under the care of a specialist, more patients were not under specialist care than those that were (49.3% vs 47.3%). If, in cases where this question was not answered, there is no specialist input (hence, why it was left blank), then over half of patients prescribed these high doses were not under the care of a specialist. This lack of specialist input is a concern, particularly with respect to the BPS recommendations and more importantly for ongoing patient safety. The reasoning for the lack of specialist involvement was not requested in the data collection, but this may be an area for future investigation, possibly at a national level. If this level of secondary-care input is reflective of most UK high-dose opioid prescribing, there would be significant pressure on access to specialists and secondary-care services if the BPS referral guidelines were to be strictly followed.

The type of pain being treated was primarily musculoskeletal in origin with back, neck, limb and joint pain the most frequently recorded indications for the use of a strong opioid. The lack of evidence for the use of opioids in musculoskeletal pain^{5,43,44} indicates potentially inappropriate prescribing and may lead to dose escalation if the lack of efficacy is put down to insufficient dose.

Further indications were of concern, particularly with 'mental health'-related indications noted 11 times. None of the drugs investigated are appropriate for use in any mental health diagnoses. Furthermore, these drugs are not licenced for the treatment of dependence and their use is not recommended locally or nationally. If one (usually slow release morphine) were to be prescribed, it would need to be undertaken by a specialist in drug dependence with appropriate competencies (Department of Health⁴⁵).

Dependence is an inevitable concern with high-dose opioids. Diversion, the selling or supply of medication to individuals other than to who they were originally prescribed, is an associated point. In all, 19 patients in Stage 1 appeared to be overusing their medication according to our criteria, a potential indicator for dependence, whereas dependency was a stated issue for 106 patients in Stage 2.

Due to concerns of misuse and its involvement in deaths, tramadol was reclassified in 2014 as a controlled drug in the United Kingdom.⁴⁶ Tramadol use also has a risk of seizures, serotonin toxicity and drug interactions

Table 7. Ongoing treatment plans for high-dose opioid patients following Stage 2 review.

Treatment plan	Number of patients
To continue (chronic pain)	196
To be reduced	57
Awaiting advice/outcome (will continue in meantime)	29
For review appointment	28
New treatment, future unclear	6
Stopped	5
To continue ('likely to become palliative')	3
To be stopped	2
RIP	2
Blank/unclear	35

which make it a less preferred prescribing option. More than one patient in 10 in this cohort was prescribed it concurrently. Good prescribing practice indicates that the dose of the strong opioid should be adjusted to negate the need for concurrent tramadol prescribing.

The medication reviews prompted by this project resulted in 17.6% (64 of the 363) high-dose patients having doses reduced or stopped altogether. From the outset, the intention of this work was to encourage review of current prescribing, not to force prescribing changes, any changes made suggest that the GP reviewer had reconsidered the prescribing and made the decision that it was not appropriate going forward. In addition, a further 28 patients were due to have a face-to-face review appointment with a GP to discuss ongoing pain management needs.

Limitations

The main limitation of this work was the quality of data provided by the clinicians. Despite clear guidance on the use of the data collection tool and the data entry completion, different interpretation by individuals resulted in additional data cleaning that could have been avoided if the data collection had been performed by dedicated researchers. However, the use of dedicated researchers to gather data would lose the input being completed by a GP who has the ability to consider a prescribing change.

One of the areas of interest was the prevalence of the use of oral morphine 10 mg/5 mL liquid as an irregular 'when required' analgesic. The data collection tool was limited in this respect and the data collected did not clearly separate patients on regular dosing and 'when required' dosing. This could be built into future iterations of the tool.

It is hoped that the development of the data collection tool will enable further prescribing evaluation studies to be undertaken, and this will enable comparison between participating localities and allow validation of

the tool. Eventually, the tool could be used in GP practices to prompt a GP referral of a high-dose opioid patient to a pain management centre.

Conclusion

This project demonstrates the feasibility of using an automated electronic tool to review high-dose opioid prescribing in the primary-care environment. The data collection tool helped provide data to better understand prescribing of high-dose opioids in the locality. It provided data at the individual prescribing level, including numbers of patients, the indication and doses for prescribing drugs in use. The review process helped identify prescribing concerns and promote individual consideration on the long-term care of the patients reviewed and in some cases, prescribing changes to improve patient pain management and reduce possible dependence. The tool is freely available for adaptation and use in other localities.

Acknowledgements

The authors are grateful to the GP practices for supporting this work and for their participation. They also thank Jane Underwood for producing the data collection template and Emma Harrison and Katrina Vout for their work with the study procedures and practices.

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship and/or publication of this article.

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