The use of analgesics for postoperative pain after discharge from the hospital – a prospective observational study

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Abstract

Background and objectives: **Pain medication is often prescribed after discharge from the hospital after surgery. While there is a wealth of information available regarding prescription habits and usage in the United States of America, data on postoperative pain medication usage and disposal is scarce in Belgium.**
Design, setting and methods: **In this prospective study in a tertiary care hospital, we recruited patients scheduled for elective same-day or overnight foot surgery, shoulder arthroscopy, anorectal surgery, laparoscopic cholecystectomy or laparoscopic inguinal hernia repair from August to September 2021. Using standardized surveys by telephone calls we assessed patient-reported outcomes of pain medication consumption and handling at 14 days and 6 months after surgery. The data collected included demographic information, medication use, pain levels, and patients' understanding of the prescribed drugs.**
Results: **Of the initial 77 eligible patients, 25 were not included because of language barrier and refusal and 6 were excluded during the study because of hospital admission for other reasons. The mean age of the patients was 53 ± 16.1 years old, and the majority were male (58%). Pre-surgery, eight out of 52 patients reported taking daily pain medication (15%). At the 2-week mark, 28 patients (60%) were taking analgesics. After 6 months 18 patients (39%) continued the use of analgesics of which opioids were prescribed to 11 patients, eight of those patients were opioid naive before surgery. Only three patients (6%) stated that they were informed about the disposal of unused medication.**
Conclusions: **This study describes the current situation of analgesic use after several types of surgeries. Many patients reported continued use of analgesics including opioids 6 months after surgery and the lack of knowledge regarding safe disposal of pain medication. More should be done to prevent the continuous use of analgesics and the correct disposal of unused medication.**

Keywords: **Analgesics, Postoperative period, Postoperative Pain, Opioid.**

Introduction

During the past 15 years, a sharp increase in opioid use has been reported in the United States (US) and Canada, with a concomitant increase in opioid dependence and opioid-related morbidity and mortality. In the US, an average of 130 people die daily from opioid overdoses, 65 of them because of opioids prescribed by healthcare providers[1].

While the US and Canada are experiencing an "opioid crisis", significantly less data is available about the current situation in Europe[2]. A retrospective study by Kalkman et al. showed that the number of opioid prescriptions had doubled during the period from 2008-2017 and mainly due to patients being prescribed oxycodone. In addition, an increase in the number of hospitalizations due to opioid intoxications was reported, illustrated in Figure 1 and 2[3].

Acute pain in the postoperative setting, which was investigated in this study, is primarily nociceptive pain. By definition, this is pain that arises from

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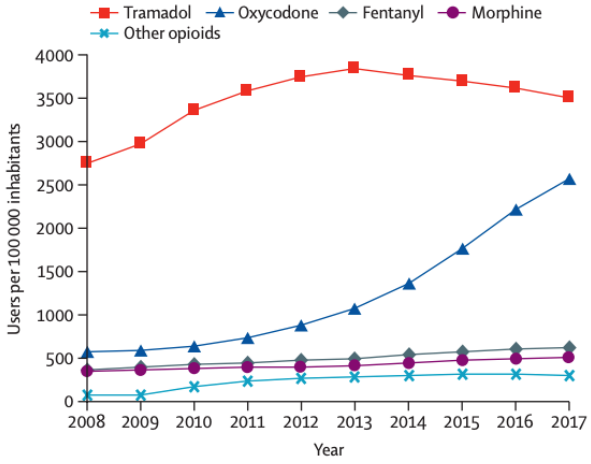


Fig. 1 — Users of prescription opioids in the Netherlands per 100 000 people[3]

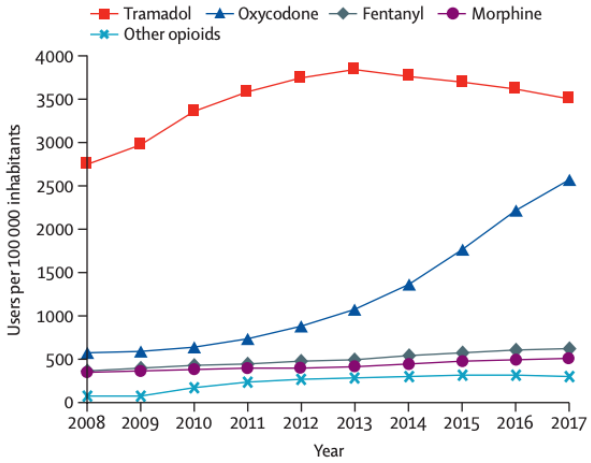


Fig. 2 — Number of hospitalizations in the Netherlands related to opioid intoxication[3]

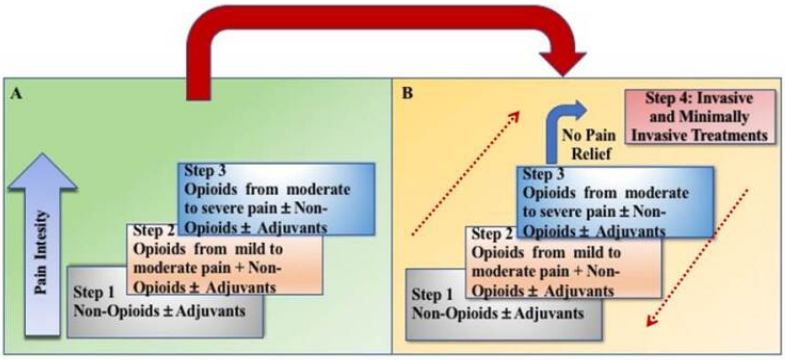
actual or threatened damage to non-neural tissue and is due to the activation of a nociceptor[4]. As a guide for the treatment of nociceptive pain, the World Health Organization (WHO) analgesic ladder is often used, which can be seen in Figure 3.

Paracetamol is usually chosen initially, with a Non-Steroidal Anti-Inflammatory Drug (NSAID) added if insufficient effect. The second step is an addition of a weak opioid (tramadol or codeine) on top of the first step. In the third step, the weak opioid is replaced by a strong opioid (morphine and relatives), this still in combination with the first step of paracetamol and/or NSAID[5,6].

The WHO analgesic ladder was originally introduced in 1986 to address cancer pain. It recommended escalating treatment to higher steps if pain persisted or intensified [7]. In 2018, an updated version of the WHO pain ladder was published, which included a fourth step incorporating non-pharmacological interventions. This revision aimed to broaden the ladder's applicability to acute pain, not just cancer pain, employing a bidirectional approach.

The bidirectional approach meant that for chronic pain, a "step-up" model was employed. Starting from the bottom of the pain ladder, treatment would progress as pain intensity increased. On the other hand, for acute pain, it was advised to initiate treatment at the highest necessary step and then reduce as the pain came under control[8].

Initially, the 1986 guidelines lacked convincing evidence of the clinical efficacy of weak opioids, and there were concerns about their potential for abuse[7]. Weak opioids were deemed valuable for low-to-middle income countries where access to strong opioids might be restricted. The goal was to achieve optimal pain relief using legal means in these regions[9]. However, the 2018 guidelines



Transition from the original WHO three-step analgesic ladder (**A**) to the revised WHO fourth-step form (**B**). The additional step 4 is an "interventional" step and includes invasive and minimally invasive techniques. This updated WHO ladder provides a bidirectional approach.

Fig. 3 — WHO Analgesic ladder[8].

omitted explicit mention of weak opioids. Instead, step 2 was described as "opioids for mild to moderate pain, with or without a non-opioid analgesic, with or without adjuvant." This change occurred because evidence remained insufficient to support the use of weak opioids in cancer pain management, and it was observed that low doses of strong opioids, with or without a non-opioid analgesic, were more effective and provided faster pain relief[10].

Since there was little guidance or literature available on acute postoperative pain, the "3-step" escalation model of the WHO pain ladder was used as the basis for the report published by the "Royal College of Surgeons" and "College of Anesthetists" on the management of acute postoperative pain[11]. Considering the fact that postoperative pain is typically at its highest intensity within the first 24 hours after surgery and then gradually subsides, it is important for the policy in this situation to focus on aggressively treating the initial pain and reducing the analgesic medication once the pain starts to decrease and the patient's functionality is restored. This requires a different approach than cancer pain, where there is classically an increase in pain symptoms as the disease is further evaluated[5].

Studies have shown that 6 to 10% of opioid-naive patients who have undergone surgery take opioids chronically afterwards[12,13]. Given the large number of surgeries that occur daily, this is certainly a non-negligible number with major implications at both the individual patient and societal levels. Therefore, the development of long-term opioid use after surgery has become a major "complication" with significant implications for both individual patients and society[13].

Given the important social and financial impact of the opioid crisis in the US and Canada, the data on the Netherlands, and other studies from Europe warning of an unfavorable trend in opioid use and abuse[14,15], the purpose of this study is to get an idea, although on a smaller scale, of the current situation in Belgium.

In order to investigate post-operative analgesic consumption in a cohort of patients operated in our tertiary referral center, we designed a prospective observational study. Our primary end-point was to determine opioid and non-opioid use at 2 weeks and 6 months following specific procedures (shoulder surgery, foot surgery, anorectal surgery, laparoscopic cholecystectomy and laparoscopic inguinal hernia repair).

Methods

The STROBE-guidelines (Strengthening the Reporting of Observational Studies in Epidemiology) were followed 16 and the study protocol received a positive opinion by the Ethics Committee on 30/06/2021, with reference BC-10168 and Chairperson Prof. dr. P. Deron. Full name and address of the Ethics Committee are as follows: Commissie voor Medische Ethiek, Corneel Heymanslaan 10, 9000 Ghent, Belgium. It was a monocentric study, with all patients being included at the University Hospital of Ghent. A written informed consent was obtained from all patients, which was taken at the time of inclusion in the study. We chose to study elective procedures that may result in chronic pain, or be associated with the long-term use of opioids and non-opioid analgesics. Patients were included who underwent one of the following procedures in August

or September 2021: laparoscopic cholecystectomy, laparoscopic inguinal hernia repair, anorectal surgery, shoulder surgery and foot surgery.

Exclusion criteria were age under 18 years, communication difficulties and patient refusal.

Data was obtained from patients at three separate instances. After written informed consent was obtained, an initial questionnaire was completed by the patients. This involved obtaining demographic data and information about known risk factors for developing long-term opioid use such as current use of analgesics, alcohol, sleep medications, antidepressants, smoking and current pain conditions. For the preparation of this manuscript, the guidelines 'Guide to contributors, master thesis' of the BeSARPP ware used[17].

The included patients were contacted by telephone at week 2 and month 6 after surgery. At these moments, a standardized questionnaire was completed by telephone with the patients, mainly about the use of analgesics, both opioid and non-opioid.

The questionnaire asked whether any analgesics were still being taken at that time and, if they had already been stopped and if the answer was yes, the timing and reason for stopping were given. They were asked which, if any, analgesics were being taken. To be thorough the following questions were also asked: was the patient information leaflet read, what was the reason for stopping analgesics (if stopped because of side effects: what side effects), are there any unused opioids at home and is the patient aware of what to do with them. If pain symptoms were still present, inquiries were made about the localization of the pain and the Numerical Rating Scale (NRS) score, and finally patients were asked if they thought the prescribed dosage (both dose and amount) was correct. All these obtained data were afterwards processed in a table. If patients were hospitalized before the first or second contact time by telephone, the patients were excluded, and the data were not used for the final results.

Patient-reported outcomes

The primary endpoint of this observational study was to investigate the prevalence of postoperative opioid analgesic use at 2 weeks and 6 months after the aforementioned surgeries. Prolonged opioid use was defined as the use of opioids for more than 7 days after surgery, as per Centers for Disease Control and Prevention (CDC) guidelines which suggest 3 to 7 days of use for acute postoperative pain under normal circumstances.

In addition to the primary endpoint, the following secondary endpoints were examined:

- Demographic data at the beginning of the study.
- Patient compliance with reading the patient information leaflet.
- Patients' perception of the adequacy of the prescribed dose and quantity of postoperative analgesics.
- Reasons for discontinuation of opioids postoperatively.
- Whether patients received instructions on what to do with unused opioids.
- Whether patients recommended analgesics to friends and family.

Analysis

The results obtained at the time of inclusion and 2 weeks and 6 months postoperatively were collected. The primary endpoint, the prevalence of postoperative analgesic use, was calculated on a patient population of 47 patients at 2 weeks and 46 patients at 6 months.

Discrete data are presented as counts and percentages. Analysis was performed using Excel (Version 16.73). Data were entered in an electronic database. To ensure patient confidentiality and pseudo-anonymity, an adapted patient number was used in the database for patient identification, in compliance with the GPDR regulations.

Results

The flowchart (Figure 4) shows the summary of patients who were included in the study. During the inclusion period (August 1st, 2021 till September 30th, 2021), there were 77 patients who underwent laparoscopic cholecystectomy, laparoscopic inguinal hernia repair, anal surgery, shoulder surgery or foot surgery. Of these 77 patients, 25 were excluded, the main reasons being language barrier and patient refusal. Of the 52 patients included, 5 patients were hospitalized between time of study initiation and first contact 2 weeks postoperatively. Between 2 weeks and 6 months, 1 more patient was excluded because of hospitalization during this period. Finally, 46 patients remained after 6 months, and these results were used for further analysis. Table 1and 2 summarize the obtained results.

Demographic data

Initially, baseline and demographic data were collected from the included patients at the start of the study. These data are shown in Table I.

The majority of patients underwent anorectal surgery (38%), followed by foot surgery (21%), laparoscopic cholecystectomy (17%), laparoscopic inguinal hernia repair (15%) and foot surgery (21%). The mean age of the included patients was 53 years (SD 16.1) and the majority were men (58%).

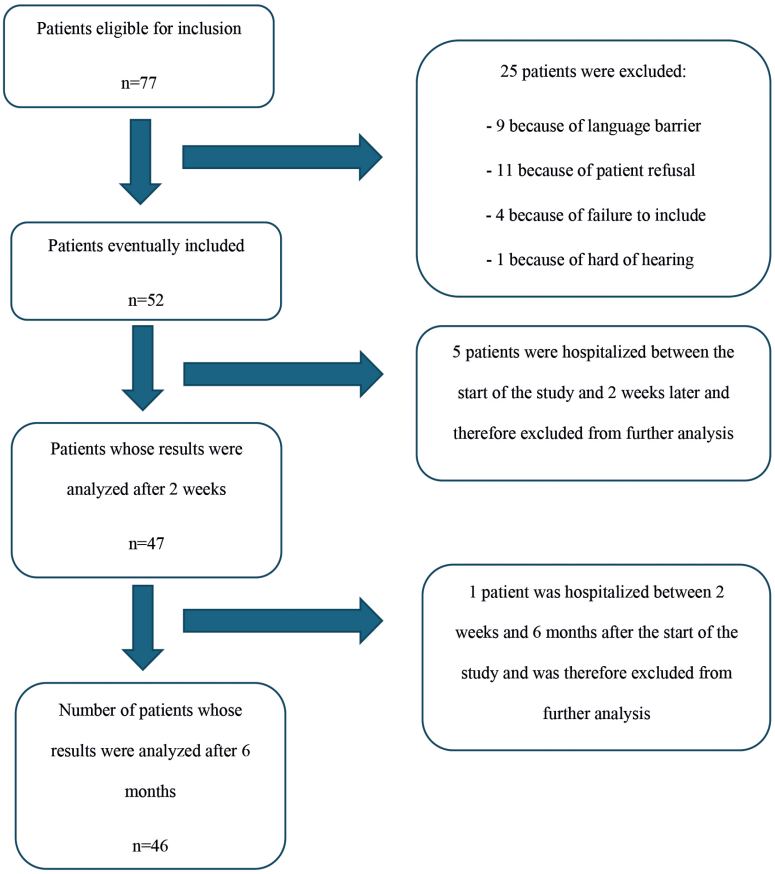


Fig. 4 — Flowchart of included and excluded patients.

Table I. — Patient data before the surgical procedure – baseline characteristics.

Baseline characteristic	Included patients	
	n	%
Type of Surgery		
Laparoscopic cholecystectomy	9/52	17%
Laparoscopic inguinal hernia	8/52	15%
Anorectal surgery	20/52	38%
Shoulder arthroscopy	4/52	8%
Foot surgery	11/52	21%
Average age	52,8 years old (±14,5)	
Male	30/52	58%
Female	22/52	42%
Weekly intake of pain medication	15/52	29%
Daily intake of pain medication	8/52	15%
Intake of opioids (weekly)	6/52	11%
Intake of sleep medication at this moment	6/52	11%
Active smoker	12/52	23%
Ex-smoker	13/40	32%
Average number of alcohol consumptions per week	3,6 (± 5,3)	
Intake of antidepressants in the past	10/52	19%
Current intake of antidepressants	4/52	8%
Pain symptoms at site of surgery	38/52	73%
Mean NRS at level of operation site[a]	5, 2 (± 2,2)	
Pain symptoms elsewhere in the body	18/52	34%
aNRS, Numerical Rating Scale		

29% of patients reported taking weekly analgesics at the time of inclusion in the study, these were mainly paracetamol (in 13 of 15 patients), NSAID (in 8 of 15 patients) and tramadol (in 6 of 15 patients). In addition, we retained 1 patient taking weekly sumatriptan and 1 patient taking weekly pregabaline. 11% of patients took sleep medication at the beginning of the study (mainly involving zolpidem,

alprazolam and lormetazepam), and no clear relationship was seen between opioid intake and sleep medication intake. 32% of patients reported ever having smoked but have quit in the past, and 23% are active smokers. The average number of alcohol consumption on a weekly basis is 2 and ranges between 0 and 30 units per week, with the majority of patients indicating an average consumption between 0 and 10 units per week. Of the included patients, 19% had previously taken antidepressants. Notably, 5 out of the 6 patients who reported weekly opioid use had also taken antidepressants in the past. Finally, 73% of patients reported experiencing pain symptoms at the surgical site, and 34% of patients experienced pain symptoms elsewhere in the body, mainly involving back pain.

Results after 2 weeks

60% of patients took analgesics 2 weeks postoperatively and of these, 78% were opioids. In this study, all these patients took Tramadol 100mg and Tradonal odis 50mg, no other opioids such as oxycodone or codeine were prescribed postoperatively. In this study, analgetics were prescribed by the anesthesiologist if the patient underwent sameday surgery, and the treating surgeon prescribed the analgetics if the patients were hospitalized and stayed overnight. Out of the total patient sample, postoperative opioid prescriptions were given to 60% of them. This resulted in 22 out of 28 opioid-prescribed patients still using opioids two weeks after the operation. Among the patients who discontinued opioid use during this period, all attributed their decision to not needing the medication anymore, while 21% cited fear of addiction as an important additional factor. 32% of patients who were prescribed analgesics, both opioid and non-opioid, read the patient information leaflet. Of these patients, 89% used their prescribed analgesics for pain symptoms at the level of the surgical site, while 11% used them for other pain symptoms, particularly back and shoulder pain. Three patients who were prescribed opioids reported having received information regarding unused opioids and what to do with them. In the two weeks postoperatively, 25% of the patients suggested to family, friends or acquaintances to use the prescribed analgesics for pain relieve and this involved opioids in 75% of the cases.

Results after 6 months

Of all the patients, 60% were taking analgesics 2 weeks after the operation, and of these 60%, 78% involved opioids. At the 6-month follow-up, 39% of the patients still used analgesics, of which 61% were opioids (Tradonal 100mg and Tradonal Odis). All patients who were still taking analgesics were using paracetamol, while 33% of them were also using NSAIDs. Among the patients, 77% used analgesics to manage pain at the surgical site, while 23% used them for pain elsewhere in the body. Both after 2 weeks and 6 months, most of the patients who continued analgetic use, underwent foot surgery. Eight out of the eleven patients who continued opioid use after 6 months, were opioid naïve before surgery and from the six patients who used opioid analgetics before surgery, four of them still used opioid analgetics 6 months after surgery. After 6 months, 30% of the patients had read the patient information leaflet. All patients indicated that the prescribed dose of medication was correct. However, only 56% of the patients considered the amount of analgesics prescribed to be correct, and all of them stated that the amount of medication prescribed was too large.

Discussion

In Europe, the average consumption of opioid analgesics is substantially lower than in the US[2]. Possible reasons for this are the fact that there are stricter regulations regarding the prescription of opioids in most European countries, along with monitoring of compliance of these regulations. In addition, it is suggested that the relatively easy availability of other synthetic recreational drugs in many European countries would cause prescription opioids to be used less for recreational purposes[18]. Nevertheless, significant increases in prescription, as well as mortality due to opioids have been observed in some European countries in recent years, including France, the Netherlands and Germany[3,19,20].

Several studies have been published in the past showing that opioid use was safe with minimal risk of addiction in patients with no history of addiction[21]. In 1995, a campaign was launched in the US that referred to pain as the fifth vital sign, encouraging physicians to pay more attention to patients' pain perception and promoting the use of opioids as a treatment for non-cancer pain. This led to an increase in opioid prescriptions and the emergence of a culture of opioid use[22]. A 2015 study in the US found that over 70% of prescribed opioids were not used, and about 65% of individuals with opioid abuse issues obtained opioids through means other than those prescribed by a physician. These opioids are frequently shared or sold to friends or acquaintances and may also be obtained through illegal sales or theft. Therefore, overprescribing opioids increases the likelihood of having unused opioids at home, which raises the risk of the aforementioned phenomenon[23,24].

Table II. — Results obtained after 2 weeks and after 6 months.

Results questionnaire after 2 weeks		
	n	*%*
Current intake of analgesics [b]	**28/47**	***60%***
Current intake of opioids [b]	**22/28**	**79%**
Patients who were prescribed opioids	28/47	60%
Correct dose of analgesics prescribed according to the patient	47/47	100%
Correct amount of analgesics prescribed according to the patient	31/47	66%
Reason to stop the use of analgesics		
No longer needed	*19/19*	*100%*
Fear of addiction	*4 /19*	*21%*
Did you read the patient information leaflet?	15/47	32%
Taking analgesics for pain at the operation region?	25/28	89%
Explanation about opioids who are not used?	3/22	14%
Ever suggested to friends/family to take these painkillers?	12/47	26%
Of these, percentage of opioids	8/12	75%
Mean NRS at the operation site at rest	2,4 (±0,8)	
Results questionnaire after 6 months		
	n	*%*
Use of analgesics at 6 months [b]	**18/46**	***39%***
Reason stop use of analgesics		
No longer needed	*28/28*	*100%*
Fear of addiction	*10/28*	*36%*
Side effects	*3/28*	*11%*
Average number of days of analgesic use of the 28 patients who stopped taking analgesics at 6 months	10,6 (± 8,9)	
Intake of analgesics for pain at the surgical region	14/18	*78%*
Intake of analgesics for pain elsewhere than the surgical site	4/18	*22%*
Intake of paracetamol	18/18	100%
Intake of NSAIDs[a]	6/18	33%
Intake of opioids [b]	**11/18**	**61%**
Did you read the patient information leaflet?	14/46	30%
Correct dose of analgesics prescribed according to the patient?	46/46	100%
Mean NRS at the operation site at rest	1,9 (±1)	

[a]NSAID, Non-Steroidal Anti-Inflammatory Drug; [b]Primary outcomes.

The use of analgesics, both opioid and non-opioid analgesics, in the postoperative setting is something that anesthesiologists, as well as physicians from other disciplines, encounter on a daily basis. The decision of whether or not to prescribe analgesics, as well as the dosage and duration of their use, can have a significant impact on the development of prolonged analgesic use and its potential adverse effects. Therefore, careful consideration of these aspects and appropriate follow-up of analgesic use is crucial.

Our analysis showed that 6 months after the aforementioned surgeries 18 of 46 patients used analgesics, of whom 11 used opioids. Eight of these patients were opioid naive before surgery. Recent numbers from the United States showed that 6-10% of the patients who are opioid naïve before surgery, will use chronic opioids after surgery but no difference was made between strong and weak opioids 13. For the current situation in Europe there are significantly less data compared to the United States. A large systematic review of persistent opioid use after surgery in Europe, showed that between 2% and 41% of patients used opioid analgetics three months after surgery[25].

CDC guidelines recommend in acute postoperative setting (without additional complications) an intake of opioids limited to 3 days, up to a maximum of 7 days if severe pain symptoms are present. Longer than 7 days is only necessary in very rare cases, and in these cases, the treating physician should definitely be contacted again[26]. One of the major risk factors for developing opioid abuse in previously opioid-naïve patients is the duration of opioid intake,

with each week of opioids are taken longer and each additional opioid prescription made, a significant increase in the risk of abuse was observed[26,27].

Whether an opioid is defined as weak or strong depends on the pharmacodynamics of the analgesic. Opioids work by occupying opioid receptors in the central nervous system. The main receptors are the μ-, κ- and δ-receptors. All opioids activate the μ-receptors; some also activate the κ- and δ-receptors. The activation of these receptors gives the beneficial effects but also the side effects of opioid. For analgesia, it has been seen that mainly the μ- receptor plays a major role. Some opioids are full receptor agonists and then one speaks of "strong opioids", when they are partly agonist and partly antagonist, we call it "weak opioids"[5,7]. Codeine is the prototype of a weak opioid. It is a prodrug, metabolized in the liver to the active metabolite (morphine) by Cytochrome P450 2D6 (CYP2D6), which implies that genetic polymorphisms in CYP2D6 can affect the rate of this process, causing the final dose of morphine to vary greatly[28]. Because of this, the effect of codeine can range from a completely ineffective analgesic (in individuals with very low metabolization in the liver) to the risk of respiratory depression in individuals with very high metabolization of the prodrug to morphine[7].

Tramadol has a dual action. First, it acts as an agonist of the μ-receptor, with its metabolite O-desmethyl-tramadol being six times more potent than tramadol itself[29]. Second, tramadol inhibits the reuptake of serotonin and norepinephrine, thereby enhancing the inhibition of pain signal transmission in the spinal cord. Although tramadol is considered a strong opioid by the British National Formulary, other classification systems, including the WHO, define it as a weak opioid due to its ceiling effect and lower potency[7]. Since tramadol also has an active metabolite, the same principle applies as with codeine, and the effect can range from an ineffective analgesic to the risk of respiratory depression depending on the degree of metabolization.

It has been described that weak opioids (including tramadol and codeine) have a higher risk of developing opioid dependence than strong opioids, which in turn have a higher risk of true addiction.

Weak opioids have some potentially dangerous properties that can be easily forgotten, due to their lower potency. As a result, they are often perceived as "safer" than strong opioids. However, studies have shown that weak opioids are thought to account for a quarter of all opioid-related deaths in England and Wales[30]. These are important facts to consider, given that many healthcare providers prescribe weak opioids with the belief that they will reduce the risk of opioid abuse and dependence[31,32].

Based on our observations, some caveats can be made. In Belgium, it is currently not possible to prescribe unit doses through home pharmacies; only hospital pharmacies can do so. As the smallest package of tramadol, for example, consists of 30 pills, there is often a considerable amount of unused opioids left at the patient's home. This can lead to a lower threshold for using them for longer than necessary. Having these in the patients' homes can lower the threshold for using them for longer than necessary.

This highlights why the principle of unit doses prescribing seems very interesting. In this way, the attending physician prescribing opioids can estimate the duration in which opioids will normally be needed. If the patient needs opioids for a longer time, this way a physician should be consulted at an early stage and the underlying reason that opioids are needed longer than expected can be investigated already at this time. Patients at risk for prolonged opioid use should be selected more quickly and monitored closely.

At this moment, it seems that the information patients receive concerning postoperative analgetic use is mostly carried out by the prescribing physician or by the pharmacist during prescription exchange. More research should be done to investigate optimal patient education strategies. From the results obtained, it also seems very important to correctly inform patients regarding the use of analgesics. To start, it should be made clear in postoperative setting that analgesics, both opioid and non-opioid analgesics, are prescribed for pain symptoms at the level of the surgical region or sometimes for referred pain symptoms such as shoulder pain after laparoscopic procedures. If a patient develops pain symptoms elsewhere that are unrelated to the operative region, it is not intended that opioids are taken for this, regardless of the positive analgesic effects the patient may have experienced from opioids following the procedure and a physician should be contacted for the newly developed pain. The next aspect in patient education is the fact that it is very important that patients do not pass on analgesics to friends or family, even if they have experienced a favorable analgesic effect. This can include explaining to patients that there are different types of pain, with varying causes, and that not everyone is helped by the same analgesics.

In addition, few patients are aware of what to do with unused analgesics, and opioids in particular. As already mentioned, this poses a substantial risk because in this way, home opioids, which often had a good analgesic effect in the context of postoperative pain, can be taken in a low-threshold

manner at a different time and by persons other than the patient for whom it was initially intended.

Some concrete proposals for future research include the implementation of unit dose prescribing in Belgium and more extensive patient education. An important consideration is the optimal timing for patient education, which could be carried out by the prescribing physician at the time of prescription or by the pharmacy during prescription exchange. Repetition of this information may enhance patient retention. Our study highlights the prominence of tramadol as the main opioid used postoperatively, which may vary depending on the prescribing habits of physicians, services, and hospitals. It is important to note that tramadol should not be overlooked simply because it is classified as a weak-acting opioid.

Further research could also be very useful to determine which patients are at risk for the need for prolonged analgetic use and concrete proposals to identify these patients for more close follow-up or maybe different analgetic or prescription strategies.

Concerning the use of unit dose prescribing and in order to be able to implement this in Belgium, it would be interesting to investigate the problem of waste of medication and increased costs for health care this causes.

Some limitations of this study should be mentioned. This was a single center study, in which the selected patient population were patients who underwent laparoscopic cholecystectomy, laparoscopic inguinal hernia repair, anorectal surgery, shoulder surgery and foot surgery at Ghent University Hospital. The purpose of this study was to get an idea of the current state of use of analgesics in the University Hospital. However, a selection was made by examining 1 center and 5 specific procedures. For practical reasons, it was not possible to conduct a multicenter study and include multiple types of procedures in the study at this time.

In addition, we are talking about a sample size of 47 patients whose results were analyzed after 2 weeks. This is insufficient to draw definitive conclusions; hence the purpose of this study was also to give an idea about the current situation at this center. The follow-up period of 6 months was chosen because from pain lasting longer than 3 to 6 months is considered chronic pain.

It is important to note that patients who participated in this study were informed in advance that they would be contacted for a questionnaire regarding their pain experience and analgesics at 2 weeks and 6 months postoperatively. This awareness may have influenced some patients to be more conscious of their analgesic use than they would have been otherwise, potentially leading to an underestimation of the actual numbers of analgesic use reported in this study.

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