

Strong Opioid Use after Total Knee Arthroplasty

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Abstracts

Aim

The aim of this audit was to examine strong opioid discharge trends after total knee arthroplasty (TKA) in a single institution over 5 years.

Methods

A hundred discharge prescriptions were reviewed from 2014, 2017, 2020, 2021 and 2022. Data on frequency of strong opioids prescribed on discharge, the average dose and duration of the prescription were collected. Doses were converted to morphine milligram equivalents (MME). We defined strong opioids as any opioid with a MME of 1 or more. All data was analysed with Excel 2019, using Fisher's Exact Test and two-sample T-tests.

Results

There was a 280% increase (2014 n=5, 2022 n = 19, $p < 0.005$) in the number of patients prescribed opioids on discharge after a total knee arthroplasty from 2014 to 2022. There was no significant increase in total morphine milligram equivalents per patient or length of prescription.

Discussion

Strong opioid discharge prescription rates post-TKA have significantly increased from 2014 to 2022 in this institution. We must continue to monitor our practices and strongly consider the necessity of strong opioids on discharge.

Introduction

Total knee arthroplasty (TKA) is a commonly performed elective orthopaedic procedure in National Orthopaedic Hospital Cappagh (NOHC). TKA is one of the most painful surgical procedures performed, for which post-operative analgesia is a key component as poorly controlled postoperative pain can negatively affect many aspects of a patient's recovery and experience^{1,2,3}. Multimodal analgesia is considered the optimal regimen post-TKA, of which opioids play a key role. Patients in NOHC are routinely discharged with a multimodal analgesia regimen consisting of paracetamol/codeine and ibuprofen where appropriate. However, a cohort of patients will require stronger analgesia such as opioids.

Orthopaedic surgeons are the third highest prescribers of opioids and there is growing concern regarding excess opioid use due to their high risk for abuse and dependence⁴. With the U.S. opioid epidemic coming to light in recent years, Irish studies have also shown an increase in opioid prescribing over the last two decades^{5,6}. Recent studies have shown that a large number of patients given opioids post-TKA are prescribed more opioids than they require⁷. Furthermore, studies have shown that those prescribed opioids post-TKA are at an increased risk of becoming chronic opioid users^{8,9,10,11}. Average dose per day in morphine milligram equivalents (MME) also contributes to this risk^{12,13}.

In the Irish National Orthopaedic Register First Report from 2014-2019, 2,677 primary TKAs were reported and analysed. However, there is limited information regarding the analgesia discharge regimen¹⁴. The purpose of this study is to retrospectively examine trends in strong opioid prescriptions (OxyNorm, Oxycontin, Oramorph) on discharge over 5 years after a primary TKA in an institution between 2014 and 2022. The hypothesis was that strong opioid prescriptions after a primary TKA are increasing, in terms of frequency, duration and total MME.

Methods

In order to examine analgesic discharge trends post-TKA in NOHC, Bluespier clinical software was used to access electronic patient records. The first 100 TKA cases were selected from May-August each year for 5 years [2014, 2017, 2020, 2021 and 2022]. This time period was selected to encompass the changeover period in July, and therefore a range of prescribers. The inclusion criteria were the following: (1) Patients who underwent a primary TKA, and (2) during the selected timeframe. The exclusion criteria were the following: (1) revision TKA, and (2) bilateral TKA. Discharge prescriptions were investigated to assess trends in strong opioid use. We defined strong opioids as any opioid with a MME of 1 or more. Data was collected on the number of patients that received these drugs, the prescription duration and the average dose on discharge.

The number of opioid discharge prescriptions were plotted and compared for 2014-2022. Fisher's Exact Test was used to compare the difference in the number of patients discharged on strong opioids in 2014 vs 2022. A p-value of <0.05 was considered to be statistically significant. We compared the average length of strong opioid prescription in days in 2014 vs 2022 using a two-sample T-test of unequal variance. All statistical analyses were carried out using Excel 2019.

Doses of opioid drugs were converted to MME using conversion factors provided by the US Centers for Disease Control and Prevention. The average MME and duration of opioid prescription was calculated for each year. The average MME prescribed in 2014 and 2022 were compared using a two-sample T-test of unequal variance.

Ethical approval was not required as this was a retrospective audit that did not directly involve patients or any sensitive information that would associate them with these results.

Results

The difference in the number of patients discharged on strong opioids in 2014 vs 2022 was compared, where 5 prescriptions were seen in 2014 and 19 in 2022. This represented a 280% increase in the number of strong opioid discharge prescriptions from 2014 to 2022 (2014 n=5, 2022 n = 19, p = 0.0039). This increase was statistically significant and can be seen to rise gradually over the 5 years (Figure 1).

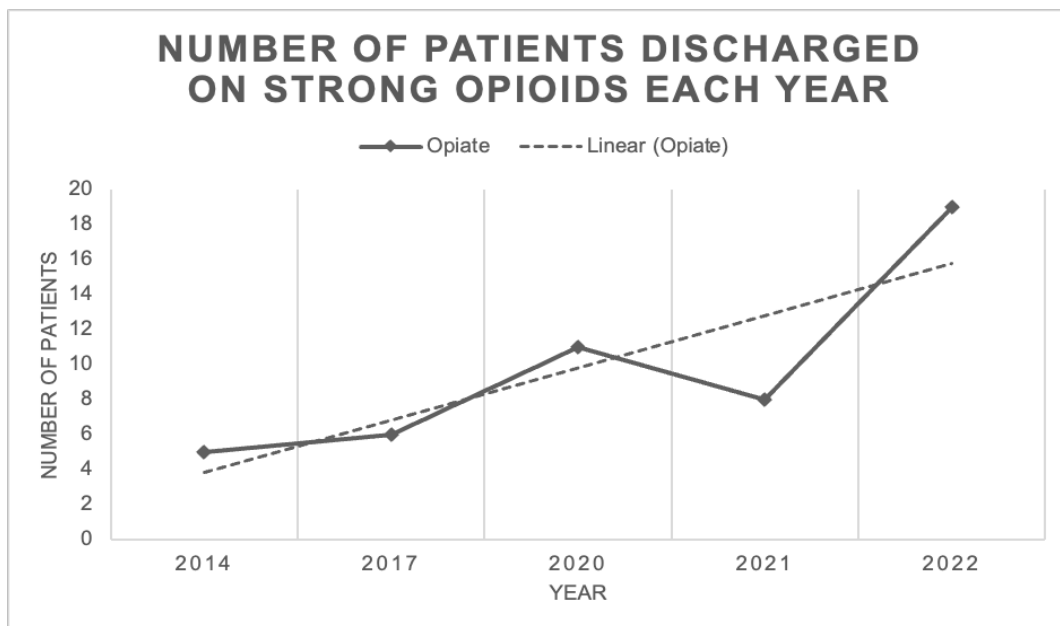


Figure 1: Number of Patients Discharged on Strong Opioids Each Year

The average MME prescribed in 2014 and 2022 was compared, with a mean MME of 112.5 in 2014 and 60.4 in 2022. There was no statistically significant difference (2014 n=5, 2022 n=17, p=0.29) (Fig. 2). Opioid doses for two prescriptions in the 2022 sample were unavailable, therefore they were excluded from this results section where n=17.

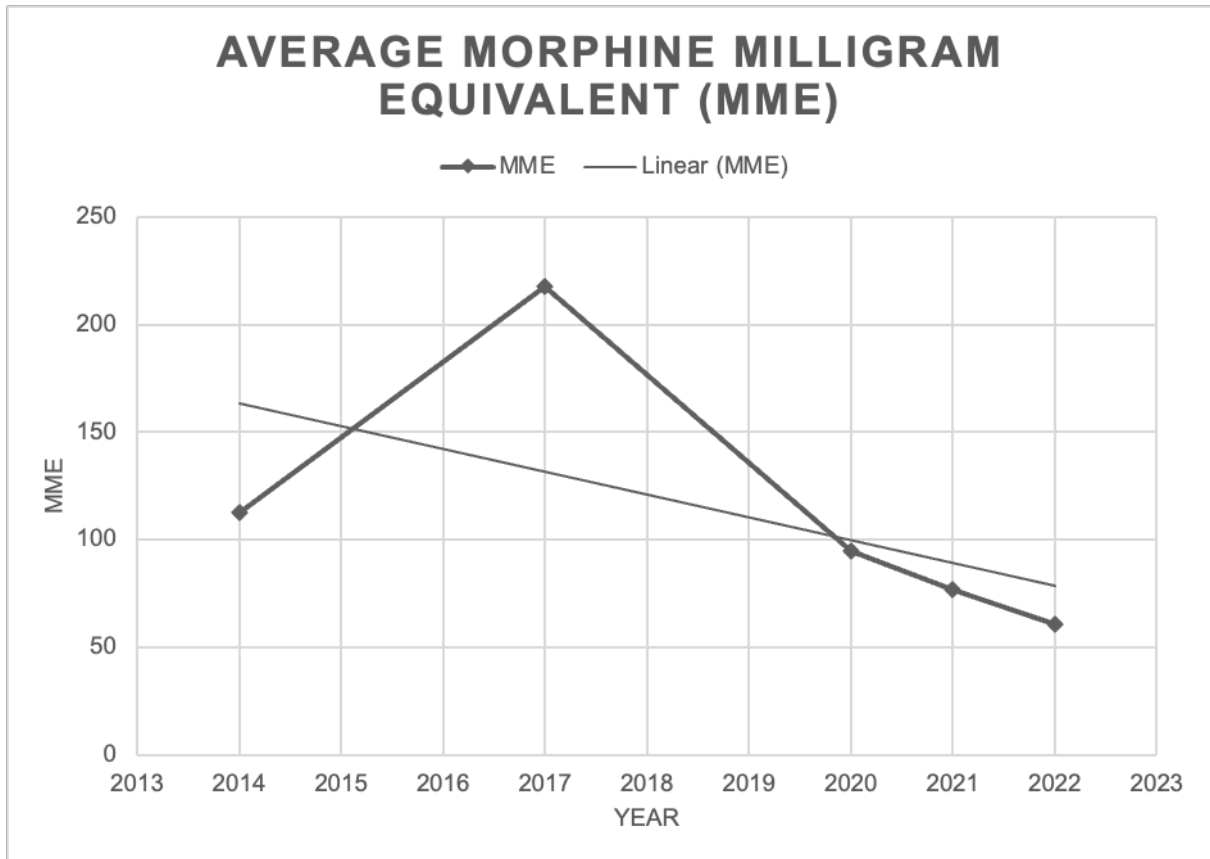


Figure 2: Average Morphine Milligram Equivalent

The average length of strong opioid prescription in days in 2014 vs 2022 was compared, with a mean length of 3.6 days in 2014 and 2.3 days in 2022. There was no statistically significant difference (2014 n=5, 2022 n=18, p = 0. 23) (Fig. 3). One opioid prescription duration was unavailable, therefore it was excluded from this results section, where n=18.

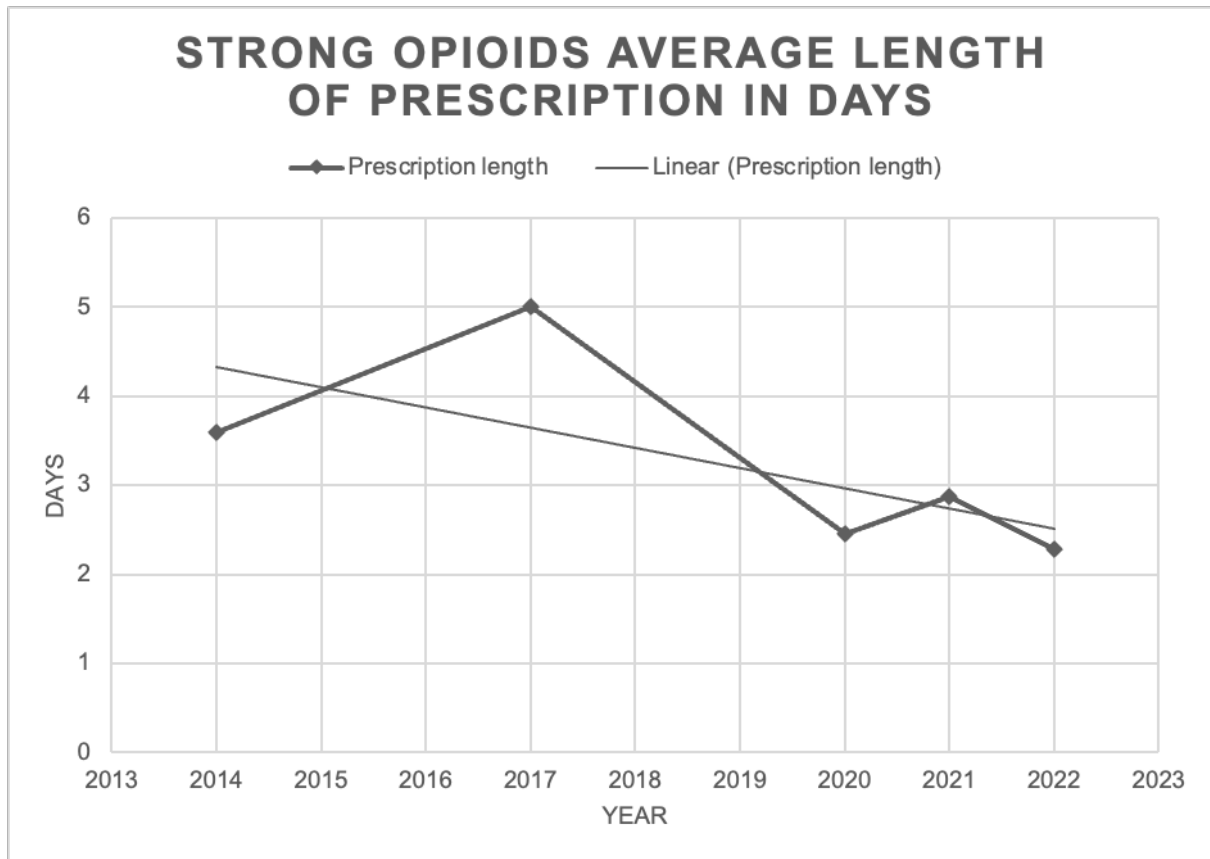


Figure 3: Strong Opioids Average Length of Prescription in Days

Discussion

From the data collected, it is clear that opioid discharge prescriptions post-TKA have risen from 2014 to 2022. This is consistent with Irish data on general opioid prescriptions, and indeed with worldwide data, which is a cause for concern amid the opioid-epidemic^{5,6}. There are many contributing factors to the rise in opioid prescriptions. These may include inadequate preoperative counselling about non-opioid pain management, patient expectations regarding levels of pain post-operatively, and prescribers' concerns about poor pain control, which could negatively affect patient satisfaction or recovery. We have previously highlighted in the introduction the detrimental effects of opioids due to their risk of abuse and dependence. In particular, opioid use in elderly patients, the primary population that undergoes TKA, should be carefully considered due to an increased risk of cognitive impairment and fractures due to fall¹⁵.

Notably, there has been no statistically significant change in average MME or duration in days, and this can be seen to trend downwards. Perhaps with a larger sample size, this downward trend would be statistically significant. Health Service Executive (HSE) guidelines

recommend a maximum of 4 days of opioids in the acute pain setting, and recognises that joint arthroplasty may require longer. The average length in days peaked at 5 days in 2017, and the remainder were under 4 days. This is in keeping with Irish and indeed international guidelines that recommend 3-5 days¹⁶.

This study has limitations, including its retrospective design and small sample size. We did not investigate the surgical technique used for these patients, for example the use of a tourniquet or tranexamic acid. The lack of data on a patient's opioid-use history is an important factor to keep in mind, as chronic opioid users are more likely to require opioids post-op than their opioid-naïve counterparts¹⁷. Another limitation is that we did not ascertain whether patients took the strong opioids as prescribed. It has been shown that we tend to overprescribe opioids following total joint arthroplasty, which could possibly leave opioids available for the patient to take at a later date or circulate in the community¹⁸. In addition, for patients who took the opioids as prescribed, it is unknown whether repeat prescriptions (and duration of such) were subsequently requested.

Future work could include an audit at a national level, as NOHC is only one institution. The Irish National Orthopaedic Register First Report from 2014-2019 analysed perioperative medication use such as anaesthesia and antibiotics in all TKAs, however there was no data on strong opioid discharge rates. We recommend that this is analysed in the next report. Different methods must be explored in order to decelerate the opioid epidemic. One such method is increased education regarding opioid prescriptions in hospitals. Studies have shown specific education for interns has reduced opioid discharge rates¹⁹. This is pertinent to Irish hospitals, including NOHC, where the majority of discharge prescriptions are written by intern doctors. Patient education is also important, as use of opioids cannot always be avoided. Education regarding disposal is recommended by the HSE and plays a key role in encouraging patients to safely dispose of their unused opioids¹⁶. One study has shown that providing patients with educational brochures resulted in increased disposal rates of unused opioids²⁰. We recommend the use of such brochures upon discharge.

In conclusion, strong opioid discharge prescription rates post-TKA have increased from 2014 to 2022 at this institution. This is in keeping with an international opioid crisis, and so we must be vigilant in our prescribing practices in order to optimise a patient's postoperative course, both in the short-term and in the long-term.

Declarations of Conflicts of Interest:

None declared.

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