

Changing Trends in Use of IV-Patient-Controlled Anesthesia (IV-PCA) in a District General Hospital over the Last 15 Years and Proposed Factors behind this

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Abstract

Our study aimed to investigate the changing popularity of intravenous opioid patient-controlled analgesia (PCA) use at our Trust. We collected data from our Trust's Pain Services database, identifying how many PCAs were used by each specialty from 2000-2014. Our data demonstrated a clear trend of decline in the use of PCA across all specialties since 2004. A survey of all of our hospital's Consultant Anesthetists was made to gather opinion regarding the reasons for this decline. The survey results suggest that PCA use has declined over the last 15 years for several reasons; the main being increasing popularity of regional anesthesia and the availability of improved oral analgesics. Despite this, 91% of the consultants in our department feel that the availability of PCA should continue and that there is still a place for its use as a form of analgesia in our patient population.

Keywords: Patient-controlled analgesia; Opioid; Analgesic systems; Pain relief

Introduction

Patient-controlled analgesic systems have been described since 1974 and have been used to deliver either intravenous opioids (IV-PCA) or local anesthetics with or without opioids through the epidural space (PCEA) [1]. They have been found to be safe and effective in relieving pain [2-4].

IV-PCA has been used in our hospital successfully since the 1990's as part of a wide range of pain control methods provided for surgical and medical wards. In addition, during the last decade, the anesthetic department in our hospital has been very progressive in implementing regional anesthetic techniques for all surgical specialties and training staff across the hospital in its aftercare. Furthermore we have seen some developments over the last two decades including the introduction of new opioid medications with better bioavailability, as well as non-opioid preparations for post-operative pain relief.

Pain services at our Trust provide daily patient review for those with acute pain, by monitoring pain scores and patient satisfaction using a standardized audit proforma. They also provide feedback to individual consultants and specialists to ensure that changes in practice will continue to satisfy patients' needs.

Although the popularity of IV-PCAs for pain relief was predicted to continue as a commonly used method of analgesia [5], our hospital's Pain Consultants anecdotally suggested the use of IV-PCA has declined over the past decade, despite the steady rise in the number of operations performed at our Trust over the years. We intended to investigate the popularity of IV-PCA prescribed over the last 15 years and examine the reasons behind any fading interest in prescribing it for pain relief in our department.

Methods

We registered our intent to review our past prescriptions for IV-PCA with our hospital's Audit Department and approval was granted. There was no potential conflict of interest with any of the investigators.

We reviewed data available from our Pain Services database that was installed in the latter part of the 1990's. Any prescribed opioid that was delivered through IV-PCA was entered into that database. We collected the data, which showed how many PCAs were used by each specialty each year from 2000-2014. This data was entered into an Excel (Microsoft Inc. 2007) spreadsheet and formed into a graph that showed the number of PCAs used on the x axis and the year on the y axis. The data for how many PCAs were used by each specialty each year was then plotted onto this graph.

The graph was used to analyze how the popularity of PCA had changed over the 15 years from 2000-2014 and whether this trend was similar across all specialties. In order to find reasons behind the decline in use of PCA at Broomfield Hospital, we designed a questionnaire for our 45 consultant anesthetists and pain specialists who regularly prescribe for acute pain purposes. The questionnaires objective was to ask direct questions to investigate reasons that might have contributed to the decline of PCA use, despite our Pain Services continuing to provide equipment and training for its use across the hospital wards. They were also asked if they felt that IV-PCA should continue to be used as a method of pain relief in our services. The results from this questionnaire were also formed into a table to show the percentage of consultants/specialists responses for their reasons for the decline in use of PCA.

Results

From our dataset we analyzed yearly trends in prescribing IV-PCA across the specialties. Between the year 2000-2014, 15,408 patients were prescribed IV-PCA in our hospital (Figure 1).

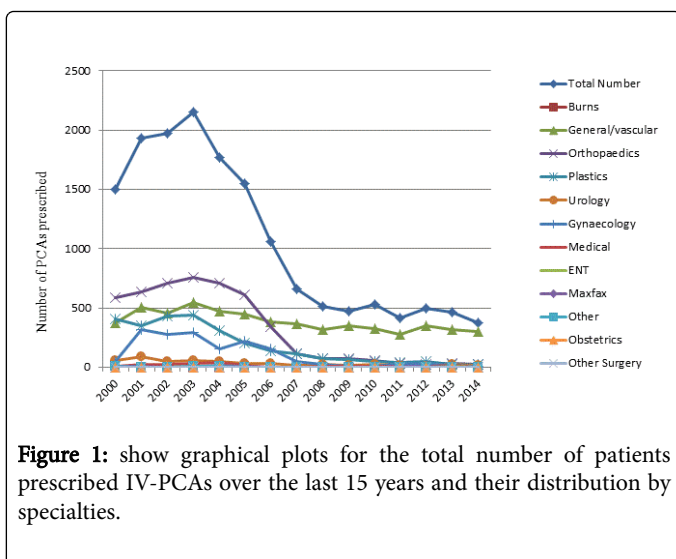


Figure 1: show graphical plots for the total number of patients prescribed IV-PCAs over the last 15 years and their distribution by specialties.

Our hospital data clearly shows the use of IV-PCA has been in decline since 2004. This decline in usage has been seen across all specialties using our Pain Services but to varying extent (Table 1).

Reasons for not prescribing PCA	% of Consultants which agree
PCA opiate less effective than by other route	22%
Lack of equipment	0%
Lack of trained nursing staff	24%
Paperwork/prescription issues	0%
Expectation of delays in making/setting up PCA	2%
Improved oral analgesics available	65%
Regional anesthesia alternative preferred	76%
Other	42%

Table 1: shows the questions we asked the consultant anesthetists in our questionnaire and the frequency of responses to each reason proposed for the decline in PCA use over the last 15 years.

In addition, our questionnaire also asked whether the consultants feel that IV PCA would continue to have important indications in the management of pain, with our results showing that 91% of consultants feel it would.

Discussion

Research has shown that PCA can be a very effective and safe method of administering opioids and may allow easier individualization of therapy compared with conventional methods of opioid analgesia [5]. However, each patient and their pain threshold is different, therefore prescriptions may still need to be adjusted if maximal benefit is to be given to all patients and it still relies on regular monitoring of adequacy of analgesia to be effective. Thus, the success or otherwise of PCA lies in how well it is used.

For the last two decades, new oral analgesics such as Oxycodone, Tramadol, Tapentadol, Oramorph have been widely used in clinical

practice [6,7]. These analgesics have added more options to the old choices of intra-muscular (IM) or sub-cutaneous (SC) Morphine injections. Regional anesthetic techniques have also been widely advocated and now used more regularly in our department. Those most frequently used are spinal and epidural anesthesia although peripheral nerve blocks are also commonly used in our department. Regional techniques provided before or during surgery can provide considerable pain relief for hours after surgery or even for days in the case of Central Neural blockade. This advantage can reduce the need for IV Morphine which is mainly needed in the immediate post-operative period.

The result of our survey suggests that the use of PCA in our Trust has declined over the last 15 years for several reasons; the main reasons being the increasing popularity of regional anesthesia and the availability of improved oral analgesics. Other reasons given by the consultants in our department for their decreasing use of PCA were that several of them deal with patients and/or operations that don't warrant the use of IV analgesia, increased difficulty for patients to mobilize post-operatively with a PCA and increased rate of post-operative nausea and vomiting with IV analgesia.

Conclusion

Our results show a clear decline in the prescription of IV-PCA over the last 15 years.

There seems to be established opinion among our consultant body, that the increased use of regional anesthesia techniques and improved oral analgesic preparations may be responsible for this decline.

Despite these results, 91% of the consultants in our department feel that there is still an important place for IV-PCA use as a form of analgesia.

In many busy hospital wards, staff numbers, time, attitudes, and knowledge may serve to limit the efficacy of nurseadministered pain relief. Therefore, it is likely that PCA will remain a commonly used method of analgesia and doctors and nursing staff should continue to undergo training in its use and aftercare to ensure its efficacy in relieving pain when used as a form of analgesia.

Competing Interests

No external funding and no competing interests declared.

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