

Nurse-managed analgesia for renal colic pain in the emergency department

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Abstract

A retrospective chart review was conducted of patients with acute renal colic for the years 1993 and 1997, in order to compare analgesia ordering and administration practices before and after implementation of a nurse-managed, titrated intravenous (IV) narcotic policy.

The study demonstrated a significant and sustained change in analgesia administration practices away from the intramuscular (IM) route in favour of the IV route. For renal colic, in 1993, 76% of patients received IM narcotic analgesia compared to 3% in 1997. In contrast, IV narcotic (with or without adjuvant NSAID) was used in 3% of the patients in 1993 compared to 95% in 1997.

Introduction

Pain is a very common reason for presenting to emergency departments (EDs) [Paris & Stewart, 1988; Walsh, 1993]. While the causes for pain are diverse, the provision of effective, timely analgesia is one of the principal goals of emergency staff. However, research to date suggests that EDs perform poorly in this area [Ducharme & Barber, 1995; Goodacre & Roden, 1996; Lewis et al, 1994; Selbst and Clark, 1990; Wilson & Pendleton, 1989]. Contributing factors include inadequate knowledge of analgesic pharmacology, the use of inadequate doses of analgesic agents, inappropriate routes of administration and poor processes for the provision of analgesia [Goodacre and Roden, 1996; Read, 1994; Reichl and Bodiwala, 1987].

It has been recommended that, when narcotic agents are the analgesic drugs of choice, these should be administered intravenously (IV) for the relief of severe pain [Acute pain management guideline panel, 1992; Ducharme, 1994]. An audit of analgesia practices in the Department of Emergency Medicine at Western Hospital, Melbourne conducted in March, 1994 showed that only 10% of narcotic analgesia was being given by the IV route and that this was almost entirely confined to patients with chest pain that was suspected to be of myocardial origin.

In response to these findings, a multi-disciplinary, process-orientated review of analgesia practices took place. The result was the development of a nurse-managed, titrated narcotic analgesia protocol. Copies of the protocol and a description of its application are available from the author on request. This paper compares analgesia practices for patients with acute renal colic before and after implementation of this change.

Method

The periods chosen for comparison were 1993 (which was about one year prior to implementation of the protocol) and 1997 (which was about two years after protocol implementation). This latter period was chosen in order to avoid any "honeymoon" effect of the new policy and to measure sustained change in practice. Renal colic was chosen as being representative of painful conditions for which adequate numbers of cases would be available to provide valid comparisons.

Patients admitted to Western Hospital (defined as a stay in the hospital of more than four hours irrespective of the area of treatment) with an admission diagnosis of renal colic for the years 1993 and 1997 were identified by the Medical Records Department using a computerised data management system. A randomly selected subset of available records, matched for patient number, underwent explicit review by a trained research assistant. The data collected included demographic details of the patient and the type, route and amount of analgesia administered during the ED phase of patient management.

Data analysis was conducted by the Department of Mathematics (Statistical Consulting Service), Monash University. It included Chi square tests of difference in proportions.

Results

The records of 128 patients were reviewed. Sixty-three were treated in 1993 and 65 in 1997. The groups were comparable for age and gender.

In 1993, 76% of patients with renal colic received IM narcotic analgesia (with or without adjuvant nonsteroidal anti-inflammatory drug [NSAID]) compared with 3% in 1997. In contrast, in 1993, IV narcotic (with or without adjuvant NSAID) was administered in 3% of the patients compared to 95% in 1997. Both these changes are significant ($p < 0.001$, Chi square). In addition, in the 1993 cohort it was found that six of the 26 patients (23%) receiving IM narcotic alone and five of 22 patients (23%) receiving IM narcotic plus NSAID required additional narcotic analgesia while in the ED. The type and route of analgesia administered for both study periods are summarised in Table 1.

Discussion

One of the primary goals of emergency department staff is the prompt, effective alleviation of pain. Historically, attempts to achieve this aim have been poor both in provision of analgesia and delay to analgesia [Ducharme & Barber, 1995; Goodacre & Roden, 1996; Lewis *et al*, 1994; Selbst & Clark, 1990; Wilson & Pendleton, 1989]. No papers have been published assessing the quality of analgesia delivered in Australasian emergency departments.

One method suggested to address this problem has been the use of pain management protocols, and particularly those that favour the use of titrated IV doses of narcotics for acute severe pain [Acute pain management guideline panel, 1992; Ducharme, 1994; Reichl & Bodiwala, 1987]. Such a protocol for management of pain in an ED was reported by Goodacre and Roden [1996]. However, a number of concerns about such protocols have been raised. They may be broadly

classified as process issues concerned with the implementation, utilisation and sustainability of the protocol and safety issues concerned with the potential for adverse events, in particular respiratory depression and cardiovascular instability.

Table 1: Comparison of analgesia ordered for patients suffering renal colic in 1993 and 1997

Method of analgesia	1993	1997
Oral only	3	1
Rectal NSAID only	0	
IM narcotic only	26	0 #
IM narcotic plus NSAID	22	2 #
IM and IV narcotic	4	0
Combination IM and IV narcotic plus NSAID	1	0
IV narcotic only	0	31 #
IV narcotic plus NSAID	2	31 #
Total	63	65

Statistically significant difference between groups; $p < 0.001$, Chi Square

The study ED took a comprehensive process approach in order to identify issues contributing to inadequate analgesia additional to route of administration and dosing and to enhance utilisation and sustainability. The resulting protocol included incorporation of pain measurement into 'routine' observations and a novel approach to the delivery and augmentation of narcotic agents.

It demonstrates the effectiveness of the policy by showing a major and sustained change in analgesia ordering and administration practice from IM to titrated IV narcotic for renal colic. The finding that 95% of patients with renal colic in the 1997 sample group were treated with IV narcotic compares favourably with the impact of the analgesia protocol by Goodacre and Roden [1996] which resulted in 37% of patients with fractures receiving IV analgesia. It is even more significant as the follow-up audit period in Goodacre's study was much closer to the implementation of the protocol than is the case in this study and thus is likely to have benefited from a 'honeymoon' effect (due to educational and promotional activities related to implementation). In the study ED, the changes in practice have been maintained over more than two years. This durability contrasts with the reported experience of other management protocols [Bezerra et al, 1992]. It is potentially due to a number of factors including the example of senior staff and the simplicity and flexibility of the policy such that it has become an integral part of everyday practice.

Although this paper specifically addresses the analgesia administration outcome for a specific group of patients, the safety issues have also been studied and are reported elsewhere [Coman & Kelly, 1999]. In 401 cases audited, there were no cases of respiratory depression identified. There were 17 cases of hypotension (BP less than 100mmHg), one hypersensitivity reaction and one vasovagal reaction.

Despite its dramatic results, this study has some limitations that must be taken into account. Although a change in practice is clearly demonstrated, this study does not address the timeliness or adequacy of analgesia. Although reasonable quality data on pain scores is available for the 1997 cases, no such data is available for 1993. Consideration was given to continuing with previous practice and collecting pain score data prior to the implementation of the protocol, but we decided this would be unethical. This study is also subject to the general limitations of retrospective studies such as documentation errors and note interpretation. Attempts were made to minimise these by the use of an explicit data retrieval system. The generalisability of this result to other painful conditions might be questioned. The policy was developed for and is applied to all acutely painful conditions so this is unlikely. Similar changes in practice with respect to acute long bone fractures have also been shown (Kelly, at press).

Conclusion

This project demonstrates that a process approach to improving pain management can make a significant and sustained change to analgesia administration practices for patients with renal colic in an ED.

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