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Hospitalization due to acute exacerbation of chronic pain: An intervention study in a university hospital

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HIGHLIGHTS

- Hospitalization with acute exacerbation of complex chronic pain is a hidden problem.
- Chronic pain services typically focus on outpatients rather than inpatients.
- We started a physician-led pain round to address complex pain issues in inpatients.
- We identified 20 patients frequently hospitalized by chronic pain for long periods.
- The intervention was successful in some patients, but not in the cohort as a whole.

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ABSTRACT

Background and aims: Hospitalization as a result of acute exacerbation of complex chronic pain is a largely hidden problem, as patients are often admitted to hospital under a variety of specialities, and there is frequently no overarching inpatient chronic pain service dedicated to their management. Our institution had established an inpatient acute pain service overseen by pain physicians and staffed by specialist nurses that was intended to focus on the management of perioperative pain. We soon observed an increasing number of nurse-to-nurse referrals of non-surgical inpatients admitted with chronic pain. Some of these patients had seemingly intractable and highly complex pain problems, and consequently we initiated twice-weekly attending physician-led inpatient pain rounds to coordinate their management. From these referrals, we identified a cohort of 20 patients who were frequently hospitalized for long periods with exacerbations of chronic pain. We sought to establish whether the introduction of the physician-led inpatient pain ward round reduced the number and duration of hospitalizations, and costs of treatment.

Methods: We undertook a retrospective, observational, intervention cohort study. We recorded acute Emergency Department (ED) attendances, hospital admissions, and duration and costs of hospitalization of the cohort of 20 patients in the year before and year after introduction of the inpatient pain service.

Results: The patients' mean age was 38.2 years (±standard deviation 13.8 years, range 18–68 years); 13 were women (65.0%). The mode number of ED attendances was 4 (range 2–15) pre-intervention, and 3 (range 0–9) afterwards ($p = 0.116$). The mode bed occupancy was 32 days (range 9–170 days) pre-intervention and 19 days (range 0–115 days) afterwards ($p = 0.215$). The total cost of treating the cohort over the 2-year study period was £733,010 (US$1.12m), comprising £429,479 (US$656,291) of bed costs and £303,531 (US$463,828) of investigation costs. The intervention did not achieve significant improvements in the total costs, bed costs or investigation costs.

Conclusions: Despite our attending physician-led intervention, the frequency, duration and very substantial costs of hospitalization of the cohort were not significantly reduced, suggesting that other strategies need to be identified to help these complex and vulnerable patients.

Implications: Frequent hospitalization with acute exacerbation of chronic pain is a largely hidden problem that has very substantial implications for patients, their carers and healthcare providers. Chronic pain services tend to focus on outpatient management. Breaking the cycle of frequent and recurrent

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hospitalization using multidisciplinary chronic pain management techniques has the potential to improve patients' quality of life and reduce hospital costs. Nonetheless, the complexity of these patients' chronic pain problems should not be underestimated and in some cases are very challenging to treat.

1. Introduction

There is a strong focus on reducing the need for emergency hospital admission and the duration of hospitalization in most global healthcare systems. Uncontrolled acute pain is one of the most common symptoms causing emergency hospital admission. In general, pain alerts healthcare professionals to a clinical problem that can then be treated appropriately.

Chronic pain persists beyond the normal, expected healing time and therefore is thought not to have an acute warning function [1]. Nevertheless, when chronic pain is severe and disabling, it may lead to unplanned hospital admission. In a proportion of patients with chronic pain, the cause of pain cannot ultimately be identified, even after repeated admissions under a variety of specialties.

Most healthcare professionals will have met patients who present to primary or secondary care frequently with a variety of recurrent clinical problems [2]. Many attend with acute exacerbations of what has become a chronic pain problem. In some of these patients the diagnosis is clear, but in a substantial proportion a diagnosis is not made, despite multiple and often repeated investigations [3]. In others, the intensity of pain experienced by the patient is thought to be out of proportion to that expected.

In our institution, a team of specialist inpatient nurses was established to manage perioperative pain, and supervise patient controlled and epidural analgesia regimes on the wards. The remit of the team quickly evolved to include the management of non-surgical patients with acute and chronic pain problems. It became clear that there was a cohort of approximately 20 patients who were being admitted frequently under one or more specialties with acute uncontrolled exacerbations of chronic pain. It was also clear that an acute hospital was not the ideal environment in which to address these patients' needs.

Having recognized the complexity of many of these pain syndromes, we sought to reduce the frequency of unplanned admissions to hospital and improve the symptoms and experiences of this vulnerable group of patients.

To do so, we instituted regular inpatient pain rounds under the supervision of a pain physician, with a view to refining, reducing or replacing analgesia regimes, offering interventions (if appropriate), introducing chronic pain management strategies and enlisting the support and input of allied health professionals (such as physical and occupational therapists, psychologists, mental health professionals and rehabilitation physicians).

The objectives of this retrospective observational intervention study were to understand the burden on patients and our institution of frequent or lengthy episodes of hospitalization for acute-on-chronic pain exacerbation, and to establish whether an intensive physician-led programme could reduce this burden. We sought to establish the number, duration, and costs of hospital admissions, investigations and therapy of the 20 patients with acute-on-chronic pain exacerbation who spent the longest periods as inpatients in our hospital, a 1,000-bed university hospital, over 1 year. We compared these with a second 1-year period immediately afterwards, when regular physician-led inpatient pain rounds had been fully established, allowing us to judge the impact of this strategy on patient outcomes.

2. Materials and methods

2.1. Study design and approval

This was a retrospective, interventional cohort study. It was registered and approved as a service evaluation with our institution's audit office.

2.2. Identification of patient cohort

We used written and electronic pain service records to identify the 20 adults known to the inpatient pain team who spent the most days as hospital inpatients at Addenbrooke's Hospital, Cambridge, United Kingdom, between April 30, 2008 and April 30, 2009. We retrospectively reviewed all Emergency Department (ED) attendances and episodes of acute hospitalization to identify the nature of the admission and whether the primary symptom was acute-on-chronic pain, or where control of chronic pain symptoms had complicated or prolonged admissions for other clinical reasons. We excluded children ($\leq$17 years), and adults admitted due to trauma, for planned surgery unrelated to the axis of chronic pain or exacerbations of medical co-morbidities in which pain management was not a feature of the hospital stay.

2.3. Parameters measured

For each patient, and for each episode of hospitalization, we recorded the source of admission (self-referral to the ED, primary care referral to hospital speciality or planned elective admission), inpatient ward (general medical, general surgical, orthopaedic, neurosurgery, gynaecology, critical care), primary axis of pain and length of any subsequent hospitalization. We also recorded investigations undertaken for each admission, including biochemistry, haematology, blood transfusion, microbiology, imaging, nuclear medicine, cardiology and endoscopy. Finally, we recorded requests for liaison psychiatry review, and for physiotherapy, occupational therapy and psychologic assessment. The costs of hospital accommodation, investigations and therapy were obtained from our institution's finance department, and the total cost of each admission was calculated.

2.4. Intervention

From May 2009 to May 2010 a regular attending physician-led inpatient pain service ward round was initiated, to complement the work of the inpatient specialist nurse team. This took place twice weekly, and focused on patients with acute exacerbation of chronic pain, to improve symptoms, minimize repetition of unnecessary investigations, facilitate discharge from hospital and subsequent outpatient management, and reduce the risk of readmission. Patients with acute exacerbation of chronic pain who attended the ED during a round were assessed by the team with a view to avoiding the need for hospitalization. We therefore examined the admissions of the same cohort of 20 patients between May 1, 2009 and May 1, 2010 to establish the effect of this intervention.

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