Scandinavian Journal of Pain 13 (2016) 27–31

Contents lists available at ScienceDirect

Scandinavian Journal of Pain

journal homepage: www.ScandinavianJournalPain.com

Educational case report

A preoperative interdisciplinary biopsychosocial opioid reduction program in patients on chronic opioid analgesia prior to spine surgery: A preliminary report and case series

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HIGHLIGHTS

- A biopsychosocial program was developed to taper opioids prior to spine surgery.
- Pain, psychosocial, and physical functioning improved despite the opioid dose being tapered.
- Overall, a preoperative opioid reduction program improves patient centred outcomes.

ARTICLE INFO

Article history:
Received 9 May 2016
Received in revised form 15 June 2016
Accepted 16 June 2016

Keywords:
Chronic pain/rehabilitation
Interdisciplinary communication
Pain measurement
Patient outcome assessment
Narcotics/adverse effects
Spine/surgery

ABSTRACT

Background: Spine surgery candidates are commonly treated with long-term opioid analgesia. However, chronic opioid analgesia is associated with poor pain control, psychological distress, decreased functional status and operative complications. Therefore, our medical centre piloted an outpatient biopsychosocial interdisciplinary opioid reduction program for spine surgery candidates on chronic opioid analgesia.
Methods: Our case series reviews the outcomes of the first 5 interdisciplinary program completers. Data was collected on admission to the program, preoperatively at completion of the program, and 1 month postoperatively. We recorded changes in pain interference scores, physical functioning, and symptoms of depression and anxiety as captured by the Patient-Reported Outcome Measurement Information System (PROMIS-29) Profile.
Results: The mean duration of the preoperative opioid reduction program was 6–7 weeks. The mean morphine equivalent daily dose (SD) decreased from 238.2 (226.9) mg on admission to 157.1 (161.0) mg preoperatively and 139.1 (84.0) mg one month postoperatively. Similarly, the mean pain interference score (SD) decreased from 72.4 (5.1) on admission to 66.5 (6.9) preoperatively and 67.7 (5.4) one month postoperatively. The preoperative opioid dose and pain interference scores decreased in all 5 patients, but one month postoperatively increased in one patient related to a surgical complication. Pre- and post-operative depression, anxiety and fatigue improved in all patients. Satisfaction with participation in social roles, sleep disturbances, and physical functioning improved in most patients.
Conclusions: Pre- and post-operative pain improved despite the opioid dose being tapered. These preliminary data suggest that a short-term outpatient preoperative interdisciplinary biopsychosocial opioid reduction program is safe, feasible, and improves patient-centred outcomes.
Implications: Our preliminary data support the rationale for expansion of the opioid reduction program; opioid use and pain should be evaluated in all surgical candidates. These findings need to be replicated in larger studies.

1. Introduction

Chronic nonmalignant pain negatively affects quality of life resulting in reduced physical, social and psychological wellbeing, and higher rates of health service utilization services [1,2]. In 2008,

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http://dx.doi.org/10.1016/j.sjpain.2016.06.007
1877-8860/

according to the Medical Expenditure Panel Survey, 100 million adults in the United States suffered with chronic pain, and the total cost to health care ranged from 261 to 300 billion dollars [3].

As a result of a confluence of societal factors, opioid analgesic prescriptions have increased in the United States [4], and between 5 million and 8 million Americans are prescribed opioids for chronic pain [5]. However, chronic opioid analgesia does not address the multidimensional subjective experience of pain, nor does it improve the physical or psychological components of pain [6,7]. Additionally, long term opioid analgesia is associated with serious harms including opioid induced hyperalgesia, poor pain control, depression, anxiety, overdose, abuse, addiction, and medication diversion [8].

Potential spine surgery candidates with back pain are often maintained on long term opioid regimens, despite the fact that chronic opioid analgesia is associated with worse surgical outcomes, poor pain control, psychological distress, and higher total health care costs [9,10]. Higher preoperative opioid doses are also correlated with decreased quality of life, increased disability, poorer overall health status, and increased postoperative narcotic use even 3–12 months post-spine surgery [9,11]; additionally every 100 mg increase in the preoperative morphine equivalent daily dose has been shown to increase the hospital length of stay (LOS) by 1.1 days [12]. Furthermore, depression, anxiety, and poor physical functioning are associated with increased pre- and post-operative narcotic use and pain [13,14], as well as worse patient reported outcomes even up to a year postoperatively [15]. Therefore, it follows that a preoperative opioid reduction program would improve pain, psychological distress, physical functioning, and operative outcomes.

Due to the limited efficacy of opioids for chronic pain, interdisciplinary and multidisciplinary biopsychosocial programs have been extensively studied in patients with spine related pain [16]. Multidisciplinary programs use knowledge from various disciplines whereas interdisciplinary programs coordinate and integrate various team approaches into a single treatment plan [17]. Biopsychosocial programs that integrate a combination of therapies, and improve physical, psychological, and social factors are more effective than standard of care (i.e. reassurance, advice, opioid analgesia) or physical treatments (i.e. heat therapy, aerobics, strengthening, and stretching exercises) to improve pain, and disability in patients with chronic back pain [16,18].

However, to our knowledge no published studies have assessed multi- or inter-disciplinary biopsychosocial treatment programs with the specific aim of reducing opioid doses in spine surgery candidates on chronic opioid analgesia prior to surgery. Therefore, we piloted a patient-centred interdisciplinary program in the spine centre to preoperatively reduce opioid doses, as well as to improve pain, psychological distress, and physical functioning in presurgical spine patients on a morphine equivalent dose (MED) >80 mg daily for at least 6 months. Our case series reviews the outcomes of the first 5 program completers.

2. Methods

The Cedars-Sinai Medical Center Institutional Review Board (IRB) approved this case series. Data was collected on admission to the program, preoperatively at program completion (the week of surgery), and postoperatively (one month post-surgery).

2.1. Pre-operative opioid reduction program

At the initial assessment, an internist, psychiatrist, pain-trained psychologist, and physical and occupational therapists performed independent evaluations and met as a team to discuss these assessments. Comprehensive tailored treatment plans were devised to taper opioid doses as well as to improve pain, functionality and psychological distress. Opioid doses were confirmed by patient history, chart review, and the California Prescription Drug Monitoring Program. The program was flexible in terms of total length of time, given differing surgery dates, but we aimed for twice-weekly clinic visits over the course of 6–8 weeks. Similarly, opioid taper regimens varied by patient but the goal was to taper the opioid dose by at least 10% per week. Psychotropic medications were added or adjusted as needed to treat co-morbid psychiatric disorders, and attempts were made to reduce benzodiazepines and other sedative medications as these also contribute to operative risks. Physical therapy (PT), occupational therapy (OT), as well as pain-focused cognitive behavioral therapy (CBT), were integral to the program. CBT training included pacing for pain, relaxation techniques, acceptance and commitment therapy (ACT) and mindfulness based cognitive behavioral therapy (MBCT). Physical therapy for pain management focused on education, exercise, manual therapy, heat modalities, and cold modalities. Goals of OT included functional goal setting, home exercise programs, safe body mechanics, and muscle tension reduction. Primary outcomes were measured with the Patient-Reported Outcome Measurement Information System (PROMIS-29). Patients successfully completed the preoperative opioid reduction program if they participated in all program modalities and made active attempts to reduce their opioid dose.

2.2. Patient-Reported Outcome Measurement Information System (PROMIS-29)

The PROMIS-29 is a well-validated and reliable self-report measure of overall well-being. The PROMIS-29 measures several domains: depression, anxiety, physical function, pain interference, fatigue, sleep disturbance, satisfaction with participation in social roles, and includes a pain intensity numeric rating scale (0–10). The raw scores for each domain are translated to a standardized *T*-score. For depression, anxiety, physical function, pain interference, and fatigue, a score of 50 is the average for the general population in the United States. For satisfaction with participation in social roles, and sleep disturbance, a score of 50 is the average of the calibration sample. A higher *T*-score reflects more of the concept being measured. For example, in anxiety, a *T*-score of 60 is one standard deviation (SD) worse than average but a *T*-score of 40 is one SD better than average. In physical function, a *T*-score of 60 is one SD better than average but a *T*-score of 40 is one SD worse than average [19]. The same clinic provider administered the PROMIS-29 profile to all program participants at all clinic visits.

3. Results

3.1. Clinical series

Patient 1 is a 65-year-old female with a history of generalized anxiety, benzodiazepine use disorder, hypothyroidism, and chronic back pain secondary to lumbar stenosis. The patient denied a history of other drug or alcohol misuse. Her medications included alprazolam, fluoxetine, gabapentin, levothyroxine, and oxycodone. The patient had been on oxycodone for 5 years for chronic back pain. Her procedure was a lumbar posterior decompression and spinal hardware placement at L4–5. She tolerated the surgery well and there were no complications. Her LOS was 4 days. She was enrolled in the program for 6 weeks, and completed 12 sessions. Her preoperative (40.5 mg) and one month postoperative (64.5 mg) daily MED were lower than on an admission to the program (150 mg). Pain interference decreased from 75.6 on admission to 69.7 pre- and