Opioids and Rehabilitation Following Lumbar Spine Surgery: A Cross-Sectional Study
Neena K. Sharma, PT, PhD; Brittany L. Melton, PhD, PharmD; Mei Liu, PhD; Kim Kimminau, PhD; Cheryl Jernigan, CPA; Cindy Leyland, EMBA; Kosaku Aoyagi, PT; Robert W. Hurley, MD, PhD; Lemuel R. Waitman, PhD

University of Kansas Medical Center; The University of Kansas School of Pharmacy; Center for Practical Bioethics; Medical College of Wisconsin

BACKGROUND
• Low back pain (LBP) is the second most common source of disability for adults in the United States.1
• 28% of US adults suffered from chronic LBP in 2010.2
• Lumbar spine surgeries (LSS) such as laminectomy (removal of a part of a vertebra) or fusion (joining of vertebrae) is a common treatment for patients with LBP when non-surgical treatments fail.3
• The incidence of (spine surgeries is rapidly increasing as the aged US population is growing4 and the rate of LBO is increasing.
• However, outcomes of LSS are not consistent and vary significantly in both short- and long-term effects.6
• Variability in patient management and rehabilitation services during the hospital stay could contribute to inconsistent outcomes and lack of improvement.
• Post-operative pharmacological pain management is a significant challenge, requiring a balance between satisfactory analgesia, overdosing, and avoidance of side effects and adverse effects.7,8
• Patients continue to experience moderate-to-severe post-operative pain and have poor function post-LSS.9
• Pain management practices during the hospital stay following LSS are based on providers’ preferences, patient-related factors and institutional guidelines. All these factors vary from institution to institution.
• Standard pain treatment during the average 3-day hospital stay following LSS consists of opioid therapy. Multimodal analgesics approach with a combination of different pain medications has been shown to accelerate patients’ recoveries, but this approach has not been extensively studied.10
• Physical therapy rehabilitation services also vary according to availability of physical therapy staff, the patient’s pain level, and institutional guidelines.
• Currently no national guidelines for acute post-operative pain management and rehabilitation services exist.
• Little evidence is available demonstrating the extent and effects of variability in patient care on patient outcomes.

STUDY AIMS
• To compare opioid analogies post-LSS during hospital stay across 3 GPC sites.
• To compare physical therapy rehabilitation encounters/days/hospital stays across 3 GPC sites post-LSS.
• To investigate data availability and quality for multiple pain medications and functional outcomes across several GPC PCORNet sites for future analyses.

METHODS
Data source, study cohort, and data selection

Data Source
• GPC data infrastructures
• 3 GPC sites:
  • University of Kansas Medical Center (KUMC) – host site
  • University of Iowa
  • Medical College of Wisconsin

• De-identified dataset will be available at each institution utilizing Healthcare Enterprise Repository for Ontological Narrative (HERON)

• HERON data source is linked to the hospital and clinic’s electronic medical records and other administrative, research, and public data sources such as the clinic’s billing system (GE IDX) and the University Healthsystem Consortium.

Study cohort
• The cohort of interest of patients with lumbar laminectomy with or without fusion with specific ICD9/10 codes (756.15, 722.83, 722.52, 724.9, Q7649, M961, M5136, M5137, M539) will be used.
• Exclusion criteria: patients < 40 years of age at the time of surgery, history of intraspinal abscesses, spine fractures, vertebral body (neoplasm (cancer), osteomyelitis, cauda equina syndrome, cognitive disorders such as Alzheimer’s disease or dementia, discectomy, and patients who did not receive opioids.

Data selection
• Based on the above criteria, we identified approximately 2000 records for patients who underwent lumbar laminectomy with/or without fusion between Jan 2012 and June 2017 at KUMC.
• All variables will be obtained on the same encounter (from one hospital admission) with a reference date between pre-surgery and post-surgery. and the time of surgery end as a reference to calculate 24, 48, and 72 hours.

Patient Outcomes

• Main outcome variables:
  • Opioid (morphine equivalents)
  • Physical therapy encounters (frequency of visits and time spent in each session)

• Secondary outcome variables:
  • Pain intensity at the time of hospital discharge and daily pain intensity during hospital stay
  • Non-opioid analgesics and other pain medications
  • Walking distance
  • Length of hospital stay and discharge status (home versus rehab facility)
  • Demographics and covariates:
    • Age, gender, BMI, ethnicity, prior level of function, prior use of opioids, comorbidities

RESULTS AND DISCUSSION

Statistical Analysis

Aim 1: Descriptive statistics will be used to examine medication usage and types (opioids vs non-opioid – various combinations of multimodal).
• Variation in total opioid dose/hospital stay and pain intensity at discharge across the 3 GPC sites will be determined using Analysis of variance (ANOVA). Non-opioid analgesics will be described as secondary analyses.

Aim 2: Descriptive statistics will be conducted to examine frequency and duration of physical therapy practice across 3 GPC sites.
• Data across 3 sites will be compared with ANOVA while controlling for length of hospital stay.

Aim 3: Descriptive statistics will be used to explore data availability of other major pain medications categories, dosage, and route; and physical therapy records that include number of physical therapy encounters, duration of each visit, and patient’s function, e.g. gait, transfer, assistance level and discharge status.

DISCUSSION

• We anticipate being able to determine the extent of variability in opioid and rehabilitation services across 3 GPC sites.
• We will be able to determine the extent of details and quality of data and the number of GPC sites that will contain outcomes of interest.

Ultimately, the study may inform best practices regarding acute post-operative pain management and rehabilitation, leading to improvement in patient outcomes and recovery post-LSS

PATIENT ENGAGEMENT

• Patient engagement efforts were utilized in designing the study with PAINS-KC group.
• The findings of the study will be presented to the participants with face-to-face meeting time.

REFERENCES