Epidemiology and Detrimental Impact of Opioid Use in Patients Undergoing Arthroscopic Treatment of Femoroacetabular Impingement Syndrome

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Purpose: To determine the prevalence of preoperative opioid use in patients with femoroacetabular impingement (FAI) syndrome and to define how opioid use influences preoperative hip pain and function at a single center. **Methods:** Between February 2015 and September 2016, patients undergoing hip arthroscopy at a single Midwest institution for FAI syndrome were retrospectively reviewed. Patients undergoing arthroscopy for non-FAI conditions and those with undocumented preoperative opioid use were excluded. Baseline validated measures (Hip Disability and Osteoarthritis Outcome Score [HOOS] pain and physical function; University of California, Los Angeles, activity scores; Veterans RAND 12 Item Health Survey) of health were collected at the time of surgery. Articular cartilage status was documented at the time of surgery. Opioid use was extracted from the electronic medical record retrospectively, and patients were designated current users, past users, or nonusers. Analysis of variance and 2-tailed Student's *t*-tests were used to detect differences between groups according to preoperative opioid use, and significance was set to $P < .05$. **Results:** During the study period 321 patients underwent arthroscopic hip surgery for FAI and met the inclusion criteria (75 were excluded). Preoperatively, 55 patients (17%) were current opioid users, 89 (28%) were past users (not within 3 months of surgery), and 177 (55%) were opioid naive. Current opioid use was associated with significantly worse measures of joint and general health including HOOS-Pain (15.3 point difference, $P < .001$), HOOS-Physical Function (13.6 point difference, $P < .001$), University of California, Los Angeles, activity score (1.7 point difference, $P < .001$), and Veterans RAND 12 Item Health Survey mental component score (5.5 point difference, $P < .001$). Outerbridge cartilage grading and presence or length of labral tears were not worse in opioid users ($P = .2$-$.61$). **Conclusions:** Preoperative opioid use is common prior to arthroscopy for FAI and has detrimental impacts on hip pain and function. The present data also suggest cessation of opioid medication for 3 months prior to surgery may have meaningful impacts on baseline measures of hip and general health. **Level of Evidence:** Level III, prognostic.

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The United States has reached epidemic levels of opioid medication prescription resulting in routine use as well as misuse and abuse. Orthopaedic surgeons have been identified as a major provider of opioid medications to patients involved in trauma or undergoing procedures.[1] Femoroacetabular impingement (FAI) syndrome has been recognized as a common source of chronic hip pain[2] and is becoming increasingly recognized and treated in primary care and specialty settings. Preoperative opioid use has proven problematic in several orthopaedic conditions including rotator cuff repair,[3] anterior cruciate ligament reconstruction,[4] and hip and knee arthroplasty[5,6]; its influence on FAI has not yet been evaluated.

Nonoperative care of patients with FAI syndrome may consist of education, physical therapy, nonsteroidal anti-inflammatory medications, activity modification, corticosteroid injections, and watchful waiting.[2,7] Recommendations for the prescription of

opioids, if necessary, are found in older literature and did not evaluate the influence of said medications on hip pain or function.[8] Studies evaluating opioid use in the perioperative period are limited to small case series.[9] Opioid pain medications are not currently recommended for symptomatic management of FAI syndrome.[2] There is a growing body of evidence supporting opioid-induced hyperalgesia.[10-12] The purpose of the present study is to determine the prevalence of preoperative opioid use in patients with FAI syndrome and to define how opioid use influences preoperative hip pain and function at a single center. We hypothesized that preoperative opioid use would be uncommon and would be associated with worse hip pain and function at the time of arthroscopy compared with patients who were not taking narcotic medications.

Methods

The study was deemed Health Insurance Portability and Accountability Act (HIPAA) compliant and approved by the Cleveland Clinic Foundation's Institutional Review Board. All patients were indicated for surgery following a period of failed nonoperative management of FAI syndrome including activity modification, physical therapy, and nonsteroidal anti-inflammatory medications plus or minus intra-articular hip injections. A retrospective review of prospectively collected data from surgeries performed at a single Midwest institution between February 2015 and September 2016 was conducted. Exclusion criteria were hip arthroscopy procedures for non-FAI conditions including isolated psoas releases (such as in the setting of total hip arthroplasty), gluteus medius or minimus repairs, infection, avascular necrosis, or isolated loose body removal. Patients with dysplasia defined as a lateral center-edge angle of $<20^{\circ}$ and those with Tonnis grade ≥ 2 osteoarthritis were also excluded. Patients were also excluded if no documentation of preoperative analgesic medications was present.

Validated measures of joint health were collected prior to surgery including the Hip Disability and Osteoarthritis Outcome Score's (HOOS) pain[13-17] (HOOS-Pain) subscale and the HOOS-physical function[18] (HOOS-PS) subscale. The HOOS-Pain and -PS subscales are scored from 0 to 100, where 100 represents the absence of hip pain or perfect hip function and lower scores represent increasing pain or worse hip function. The Veterans RAND 12 Item Health Survey (VR-12), composed of both mental component scores and physical component scores, was also collected; these are population norm-based scores where a 50 represents the average response in nonpatient populations. Every 10-point increment above or below 50 represents 1 standard deviation from population-based normative data. Finally, University of California, Los Angeles (UCLA), activity scores were obtained, where a 1 represents an inactive person who cannot leave the home and a 10 represents a patient regularly participating in impact sports.[19,20]

Prior to surgery, patients entered their demographic data including age, sex, body mass index, smoking, and cumulative years of education (as a surrogate for socioeconomic status) on provided electronic tablets. Articular findings were documented after each case by each surgeon using secure smartphone software; findings include type of impingement (cam, pincer, mixed), presence or absence of labral tear, os acetabuli, chondrolabral separation, labral calcification, chondromalacia grade using the Outerbridge classification system, capsulotomy type, and closure. Baseline scores (HOOS-Pain and -PS, VR-12, UCLA) patient data and operative factors were then stored in a Research Electronic Data Capture (REDCap)[21] database managed by the Cleveland Clinic Foundation. The medical record was then retrospectively reviewed to detect patients who had been prescribed opioid medications prior to surgery. Advanced search functions in EPIC electronic medical records were used to identify a comprehensive list of opioid medications (see Appendix 1). The use of the state's opioid database was requested and not granted for the present study. Patients were categorized into current users, past users, and opioid naive. Patients were considered to be current users if they had an opioid prescription listed within 3 months of their surgery date. Patients were considered past users if they had a previous opioid prescription listed, but this was >3 months before the surgery date. Analysis of variance, 2-tailed Student's *t*-tests, and Pearson's χ^2-tests were used to detect differences between groups according to preoperative opioid use, and significance was set to $P < .05$.

Results

During the study period, 396 patients underwent hip arthroscopy. After exclusion criteria were applied, 321 patients (81%) were identified with complete data including opioid use and baseline patient-reported outcomes instruments (Fig 1). The mean patient age was 33 ± 12.5 years, and 69% were female. Overall, 55 patients (17%) were current opioid users, 89 (28%) were past users, and 177 (55%) were opioid naive (Fig 2).

Epidemiology of Preoperative Opioid Use

Patients who were using opioid medications prior to hip arthroscopy were typically older (37.8 vs 31.1 years, $P < .001$) and were more likely to be smokers (18% in the opioid use vs 8.5% in opioid-naive group, $P < .04$; Table 1). We found no differences in gender, years of education, body mass index, or intra-articular damage