

# Psychological Healthcare Burden Lessens After Hip Arthroscopy for Those With Comorbid Depression or Anxiety



Anthony J. Zacharias, M.D., Nicole G. Lemaster, Ph.D., A.T.C., Gregory S. Hawk, M.S., Stephen T. Duncan, M.D., Katherine L. Thompson, Ph.D., Kate N. Jochimsen, Ph.D., Austin V. Stone, M.D., Ph.D., and Cale A. Jacobs, Ph.D.

**Purpose:** In this study, we investigated whether patients undergoing arthroscopic treatment of femoral acetabular impingement syndrome (FAIS) seek health care for treatment of comorbid depression and anxiety in the year following hip arthroscopy. **Methods:** Using the Truven Health Marketscan database, FAIS patients who underwent hip arthroscopy between January 2009 and December 2016 were identified. Claims related to depression or anxiety filed during the year before surgery were required for inclusion. Using claims for pharmaceutical and psychological therapy treatments for mental health disorders, four groups of patients were analyzed on the basis of preoperative anxiety/depression treatment: medication only, therapy only, medication + therapy, and no treatment. Number of opioid pain prescriptions within 180 days prior to surgery and >90 days after hip arthroscopy were also compared. **Results:** Depression and anxiety claims were identified in 5,208/14,830 (35.1%) patients. Preoperative treatment for depression and anxiety included medication only ( $n = 648$ , 12.4%), therapy only ( $n = 899$ , 17.3%), medication + therapy ( $n = 252$ , 4.8%), and no treatment ( $n = 3,409$ , 65.5%). Of the 900 patients who filled an anxiety/depression-related prescription prior to surgery, 422 (46.9%) patients did not fill a similar prescription in the postoperative year. Of the 1,151 patients receiving anxiety/depression-related therapy prior to surgery, 549 (47.7%) did not receive therapy in the postoperative year. Preoperative opioid prescriptions were filled for 393 patients (60.6%) in medication-only group, 275 (30.6%) in therapy-only group, 156 (61.9%) in medication + therapy group, and 1,059 (31.1%) in the group receiving no treatment. Opioid prescriptions >90 days postoperatively were filled for 330 (50.9%), 225 (25.0%), 120 (47.6%), and 861 (25.3%) patients, respectively. **Conclusion:** Hip arthroscopy for FAIS is associated with a decreased postoperative use of health care resources for the treatment of depression and anxiety. Clinicians should also be aware of the potential interplay between preoperative psychotropic medication use and prolonged opioid use when counseling patients. **Level of Evidence:** IV, therapeutic case series

## Introduction

The 2019 National Survey of Drug Use and Health showed 15.2% of individuals aged 18-25 and 8.9%

of those aged 26-49 years reported having a major depressive episode in the past year.<sup>1</sup> These numbers are even more striking in the hip arthroscopy population,

*From the Department of Orthopaedic Surgery & Sports Medicine, University of Kentucky, Lexington, Kentucky, U.S.A. (A.J.Z., S.T.D., C.A.J.); Division of Sports Medicine, Department of Orthopaedic Surgery & Sports Medicine, University of Kentucky, Lexington, Kentucky, U.S.A. (A.V.S.); Department of Rehabilitation Science, University of Kentucky, Lexington, Kentucky, U.S.A. (N.G.L.); Department of Statistics, University of Kentucky, Lexington, Kentucky, U.S.A. (G.S.H., K.L.T.); and Division of Athletic Training, West Virginia University, Morgantown, West Virginia, U.S.A. (K.N.J.).*

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*Address correspondence to Anthony J. Zacharias, M.D., University of Kentucky, 740 S. Limestone, K401, Lexington, KY 40503 U.S.A. E-mail: [Anthony.Zacharias@uky.edu](mailto:Anthony.Zacharias@uky.edu)*

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as mental health disorders have been reported in up to 45% of this patient population.<sup>2-4</sup> Additionally, it has been reported that 48% of patients are taking at least 1 psychotropic medication at the time of hip arthroscopy.<sup>5</sup> For patients undergoing hip arthroscopy, poor mental health has been correlated with worse preoperative patient-reported outcomes,<sup>3,4,6</sup> persistent postoperative pain,<sup>7</sup> and decreased postoperative patient reported outcomes (PROs).<sup>4,6,8-11</sup>

However, it remains unknown whether there is a potential bidirectional relationship between hip pain and poor mental health, as there is a paucity of research devoted to understanding how mental health disorders may be affected by surgical treatment of musculoskeletal conditions. Although not specific to those with preoperative depression or anxiety, Sochacki et al. demonstrated 66.2% of patients had minimal clinically important decreases in depressive symptoms following hip arthroscopy for femoral acetabular impingement syndrome (FAIS).<sup>6</sup> With limited research on the topic, it remains unclear whether these decreased symptoms<sup>6</sup> are also seen in patients undergoing hip arthroscopy with comorbid depression or anxiety that may be predisposed to an inferior outcome.

In the arthroplasty literature, the concept of medically optimizing patients before surgery to lessen the risk of complication and promote improved clinical outcomes has been widely adopted.<sup>12</sup> Similar preoperative optimization is not widely adopted for hip arthroscopy. The lack of understanding regarding chronic hip pain, delayed presentation to the managing surgeon,<sup>13,14</sup> and high use of mental health resources in the perioperative period further confounds the issue.<sup>15</sup> The purpose of this study was to investigate whether patients undergoing arthroscopic treatment of femoral acetabular impingement syndrome (FAIS) decreased prescription treatment of comorbid depression and anxiety in the year following hip arthroscopy. Our hypothesis was that use of pharmacological treatment and psychological therapy for comorbid depression and anxiety would decrease in the year following hip arthroscopy secondary to FAIS.

## Methods

Using the Truven Health Marketscan database and CPT codes 29914 (femoroplasty), 29915 (acetabuloplasty), and/or 29916 (labral repair), we identified 14,380 FAIS patients who underwent hip arthroscopy between January 2009 and December 2016. The Truven database contains Marketscan Commercial and Medicare Supplemental claims and encounters and includes more than 135 million unique individuals, which represents 20.3% of all non-CMS patients nationwide (CMS is Center for Medicare and Medicaid Services; Data source: Truven Health, Copyright 2012, 2017 Truven Health Analytics, Inc.).

Patients were included if they had one or more claims related to depression or anxiety during the year prior to surgery (ICD-9 codes 296, 298, 300, 309, and 311). Depression and anxiety diagnosis were used, as these have been previously shown to be correlated with preoperative and postoperative PROs.<sup>4,6,7,10,11</sup> Patients were excluded if they had incomplete health insurance for 1 year either prior to or following surgery. Patients with a previous hip arthroscopy prior to the index procedure were excluded. For the subset of patients who underwent a subsequent hip arthroscopy after the index event, only the index event was included in the current analyses and not the secondary contralateral or revision procedure. For patients with depression and/or anxiety, claims relating to pharmaceutical and psychological therapy treatments for mental health disorders were identified. Four groups of patients were analyzed on the basis of preoperative anxiety/depression treatment: those who received medication only, therapy only, medication + therapy, and no treatment. The total days of medication received and number of therapy sessions for anxiety/depression treatment were recorded for the year prior to, and following, surgery. We also compared the number of patients in each group who filled a narcotic pain prescription within 180 days prior to surgery or >90 days after hip arthroscopy. This was done using National Drug Code (NDC) numbers associated with all opioid agonists; opioid partial agonists, such as tramadol; and opioid combination drug classes.<sup>16</sup> Data on included patients has also been reported in a prior article.<sup>15</sup>

## Statistical Analysis

Summary statistics were calculated from the Truven database to compare patient demographic variables across the four preoperative treatment groups described above. Because of the large sample sizes in this study population, traditional hypothesis testing and *P* values are not appropriate to report, since even small differences between groups will appear to be highly significant despite not being clinically meaningful.<sup>17,18</sup> However, paired *t* tests were used to compare therapy visits and days of medication received for the small subset of the study population using these treatments during both the year prior to and following surgery. All analyses were completed using R, version 3.6.1 (R Foundation for Statistical Computing; Vienna, Austria).

## Results

Of the 14,830 patients that met the inclusion/exclusion criteria, 5,208 patients had a preoperative depression and/or anxiety claim prior to surgery (35.1%). Preoperative treatment of depression and/or anxiety was as follows: medication only ( $n = 648$ , 12.4%), therapy only ( $n = 899$ , 17.3%), medication + therapy

( $n = 252$ , 4.8%), and no treatment ( $n = 3,409$ , 65.5%) (Table 1).

Nine hundred patients filled prescriptions for medications associated with depression or anxiety in the year prior to hip arthroscopy. The median number of days of medication prior to surgery was 120 days (interquartile range = 3 to 330), and the median number of days of medication in the year after surgery was 90 days (interquartile range = 30 to 270). Of the 900 patients originally prescribed anxiety/depression-related medication, 422 (46.9%) did not fill an anxiety/depression-related prescription in the year following surgery. The mean change in total number of days of medication filled was a reduction of 66.1 days.

Psychotherapy was used by 1,151 patients in the year prior to hip arthroscopy. The median number of psychotherapy sessions prior to surgery was 6 sessions (interquartile range = 2 to 12), and the median number psychotherapy sessions in the year after surgery was 5 sessions (interquartile range = 2 to 11). Of the 1,151 patients receiving therapy related to anxiety/depression in the year prior to surgery, 549 (47.7%) did not receive therapy in the year following surgery. Mean change in total number of psychotherapy sessions from the year prior to surgery to the year following surgery was a reduction of 2.1 sessions.

Preoperative opioid prescriptions were filled for 393 patients (60.6%) in the medication-only group, 275 patients (30.6%) in the therapy-only group, 156 patients (61.9%) in the medication + therapy group, and 1,059 patients (31.1%) in the no treatment group. All groups showed a reduction from preoperative to postoperative opioid use, defined as >90 days from surgery, with postoperative opioid use found in 330 patients (50.9%) in the medication-only group, 225 patients (25.0%) in the therapy-only group, 120 patients (47.6%) in medication + therapy group, and 861 patients (25.3%) in no-treatment group (Table 1).

## Discussion

Results of this study support the hypothesis of decreased use of pharmacotherapy and psychotherapy treatments in patients that underwent hip arthroscopy with comorbid depression and/or anxiety. Both pharmacotherapy and psychotherapy treatment showed a

similar reduction (46.9% and 47.7%, respectively) in claims in those patients receiving these treatments preoperatively. Although all groups reduced the number of opioid prescriptions, a secondary finding of this study was the increased proportion of patients in the medication-only and medication + therapy groups receiving preoperative and prolonged postoperative (>90 days from surgery) opioids compared to therapy-only and no-treatment groups.

A strong body of literature has demonstrated the interaction of mental health on perception of pain and function prior to, and following, hip arthroscopy.<sup>3,4,6-11</sup> Less studied is the impact of hip arthroscopy on psychological comorbidities. Following hip arthroscopy for FAIS, Sochacki et al. showed that 66.2% of patients had a minimal, clinically important difference in reduction scores from preoperative to 1 year postoperative on the Beck Depression Inventory-II.<sup>6</sup> Chronic pain increases depressive symptoms, and with FAIS being a chronic condition, the removal of the pain generator via successful hip arthroscopy may then positively affect a patient's emotional well-being. However, we cannot assess causality as part of the insurance claims database analysis.

The results of the current study allude to a possible benefit following hip arthroscopy. The decreased use of depression/anxiety treatment-related medications and therapy should not be overlooked, as we assess developing strategies for comprehensive patient care. The next logical step is intervention-based strategies and the incorporation of preoperative treatment of comorbid psychological pathology prior to hip preservation. Richard et al. outlined their multidisciplinary approach toward adolescent hip preservation surgery.<sup>19</sup> Although their study lacked a control group for comparison, the authors provided the framework on which future studies can build to improve clinical care.

## Link Between Psychotropic Medications and Both Preoperative and Postoperative Opioid Use

Interestingly, for hip arthroscopy patients with comorbid depression or anxiety, opioid use both prior to and following surgery differs for the psychological treatments received. For context, in a previous study using the MarketScan database, 25.6% of patients filled

**Table 1.** Demographic Data

Demographic Variable	Medication Only	Therapy Only	Medication + Therapy	Neither
Patients	648 (12.4%)	899 (17.3%)	252 (4.8%)	3,409 (65.5%)
Age (years)	39.6 ± 11.3	32.3 ± 13.5	37.3 ± 12.0	34.9 ± 13.1
Female sex	478 (73.8%)	658 (73.2%)	186 (73.8%)	2387 (70.0%)
Pre-op opioid*	393 (60.6%)	275 (30.6%)	156 (61.9%)	1059 (31.1%)
Post-op opioid 90 days	330 (50.9%)	225 (25.0%)	120 (47.6%)	861 (25.3%)

Qualitative variables are reported using counts and within-group prevalence rates, while age was reported using within-group means ± SD.

\*Within 180 days of surgery.

opioid prescriptions in the 180 days prior to surgery, and 23.4% filled opioid prescriptions >90 days after hip arthroscopy.<sup>15</sup> In the current study, the prevalence of both preoperative and postoperative opioid use in the therapy only or no anxiety/depression treatment groups was very similar to those without comorbid psychological diagnoses (approximately 30% preoperative and 25% postoperatively). On the contrary, the current study identified a potential link between psychotropic medications and both preoperative and postoperative opioid use. The prevalence of opioid use for those taking psychotropic medications was nearly double that of the therapy only or no anxiety/depression treatment groups both prior to (approximately 60% vs. 30%) and following surgery (approximately 50% vs. 25%).

While not limited to hip arthroscopy, preoperative psychotropic medication use has been associated with an increased risk of chronic opioid use after both low-risk and major surgery.<sup>20,21</sup> Antidepressants appear to carry the greatest risk, with studies reporting as high as a 14-fold increase in chronic postoperative opioid use when compared to the general population.<sup>22</sup> The rationale for the increased prevalence of preoperative and postoperative opioid use for those taking psychotropic medications could be related to the severity of depression/anxiety, warranting medical treatment as opposed to therapy only and no treatment; however, analysis of multicollinearity could not be assessed in the current claims database analysis since symptom severity could not be determined. However, with previous reports linking psychotropic medication use with chronic postoperative opioid use, additional research is needed to elucidate the relationship and potential methods to reduce the risk for this apparent high-risk patient population.

### Limitations

The current study is not without limitation. Any analysis of a claims-based database inherently relies on the accuracy of the coding. Disadvantages of using these data include incomplete, inaccurate, or missing data, as well as the appropriateness of treatment in some scenarios. The Truven database may not be generalizable to the U.S. population, as data are obtained from typically working-age patients covered by private insurance. In addition, larger employers typically contribute to this database compared to small- or medium-sized firms.<sup>23</sup> Additionally, we were unable to determine whether depression/anxiety medications were used for treatment of musculoskeletal pain or specifically targeting the coded mental illness. We are unable to assess whether extenuating circumstances resulting in the absence to psychological therapy sessions, such as missing psychological therapy sessions in favor of physical therapy treatments. Other confounders, such

as tobacco use were also not assessed in this study, which has previously been shown to effect results of hip arthroscopy, as well as correlate with mental health.<sup>24,25</sup> Finally, without analysis of outcomes, such as pain scales and mental health scores, we were unable to assess for collinearity that may be present.

### Conclusion

Hip arthroscopy for FAIS is associated with a decreased postoperative use of health care resources for the treatment of depression and anxiety. Clinicians should also be aware of the potential interplay between preoperative psychotropic medication use and prolonged opioid use when counseling patients.

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