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Does the Use of Psychotropic Medication Adversely Affect the Outcomes of Hip Arthroscopy?

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Abstract

Background: Over the past decade, the use of psychotropic medications (PTMs) in the United States has doubled, and currently 20% of adults are taking 1 or more of these antidepressant, anti-anxiety, antipsychotic, or mood-altering medications. To date, however, the incidence of PTM use in patients undergoing hip arthroscopy and the results of hip arthroscopy in these patients have not been reported.

Purpose: To determine the prevalence of PTM use in patients undergoing hip arthroscopy and to compare the outcomes of patients taking PTMs versus those of patients not taking PTMs.

Study Design: Cohort study; Level of evidence, 3.

Methods: Medical records of 880 consecutive patients who underwent hip arthroscopy performed by the senior author were reviewed and data were collected, including the number and types of PTMs that these patients were taking at the time of their hip arthroscopy. All hips were assessed with the Byrd modified Harris Hip Score (mHHS) preoperatively; 709 patients (81%) had scores obtained at 12 months and 669 patients (76%) at 24 months after surgery. Demographic data and mHHS of patients taking psychotropic medications (PTM group) were compared with those of patients not taking PTMs (NPTM group).

Results: Four hundred twenty-two (48%) of the 880 patients studied were taking PTMs at the time of their hip arthroscopy; significant differences between the PTM and NPTM groups were average age (48 vs 35 years, respectively), and the high percentage of females (53%) and low percentage of males (38%) in the PTM group. Preoperative scores for the PTM and NPTM groups were similar (41 vs 42 points, respectively), but postoperative scores of the PTM group were significantly lower at 6 months (72 vs 89 points), 12 months (77 vs 91 points), and 24 months (79 vs 88 points) after surgery ($P = .01$). In contrast, the scores of the subgroups of PTM and NPTM adolescents obtained at 3 months (92.5 vs 88.9 points), 6 months (92.1 vs 90.3 points), 12 months (89.5 vs 92.1 points), and 24 months (90.3 vs 90.1 points) after surgery did not significantly differ.

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Conclusion: The incidence of PTM use in this series of patients with hip arthroscopy was triple that reported for US adults (48% vs 17%, respectively) and adolescents (23% vs 6.3%), and the PTM group had significantly lower 12- and 24-month mHHS results than the NPTM group. These results suggest that (1) patients undergoing hip arthroscopy who are taking PTMs are at significantly higher risk for poor outcomes and (2) their use of PTMs should be identified and addressed before proceeding with hip arthroscopy.

Keywords

hip arthroscopy; psychotropic medications; outcomes

Psychotropic drugs are medications that alter the levels of chemicals in the brain that affect thoughts, emotions, moods, and behaviors.^{9,12} In the United States, the psychotropic medications (PTMs) most commonly taken are anti-depressants, followed by antianxiety, attention-deficit/hyperactivity disorder (ADHD), mood-stabilizing, and anti-psychotic medications.^{2,3,9,12} Over the past 2 decades, the use of PTMs by American adults has increased 3-fold, and currently 20% of adult females and 10% of adult males take 1 or more of these antidepressant, antipsychotic, and mood-altering drugs.^{4,10,12} However, to date, the prevalence of PTM use in patients undergoing hip arthroscopy and the results of hip arthroscopy in patients taking PTMs have not been reported. Thus, the goals of this study were to determine the prevalence of PTM use in a large, consecutive series of patients undergoing hip arthroscopy and to compare the outcomes of patients taking these medications (PTM group) with those of the patients who were not taking PTMs (NPTM group).

Our hypothesis was that the percentage of patients undergoing hip arthroscopy who take PTMs is much higher than that reported for US adults in general and that the 12- and 24-month modified Harris Hip Score (mHHS) of the PTM group would be significantly lower than the scores observed in the NPTM group.

METHODS

The medical records of 880 consecutive patients who had hip arthroscopy performed by the senior author (J.S.K.) between April 2004 and August 2012 were reviewed and the following data collected: age, sex, arthroscopic findings, arthroscopic procedures performed, and the number and types of PTMs that the patient was taking at the time of hip arthroscopy. The status of the hip joint and the operative procedures performed on each patient were verified from a review of each patient's operative note, intraoperative photographs, and operative hip sheet (a drawing completed at surgery), which were available for all of the patients included in this study.

At their preoperative visit, all patients underwent a comprehensive review of the medications they were taking so we could identify the number and types of PTMs they were taking at the time of their hip arthroscopy. On the basis of these data, the 880 patients studied were separated into 2 groups; those who were taking a PTM (PTM group) and those who were not taking a PTM (NPTM group) at the time of their hip arthroscopy.

The PTM and NPTM groups were further stratified based on whether they were adolescents (ages 12–19) or adults. The age range used for adolescents in this study was the same as that used in prior studies that evaluated PTM use among adolescents.⁶ This additional data point was created and analyzed to determine whether the percentage of adolescent patients undergoing hip arthroscopy while taking PTMs was higher than the percentage reported for the general population of adolescents in the United States.

To determine the prevalence of the various types of PTMs, we assigned each PTM that a patient was taking into 1 of the following therapeutic drug categories based on whether it was classified as an antidepressant, antipsychotic, anxiolytic (antianxiety), ADHD, or mood-stabilizing medication.^{2,3,9,12} Commonly prescribed medications in each of these categories are (1) antidepressants: Prozac, Wellbutrin, and Lexapro; (2) antipsychotics: Clozaril, Risperdal, Zyprexa; (3) ADHD drugs: Adderall, Dexedrine, Ritalin; (4) antianxiety medications: Ativan, Xanax; and (5) mood stabilizers: lithium, Tegretol, and Lamictal.

Surgery Performed

All 880 patients underwent hip arthroscopy in the supine position under general anesthesia, and all patients had thorough arthroscopic evaluations of both the central and peripheral compartments of their hip joints. The arthroscopic procedures performed on the 880 patients are summarized in Table 1.

Three hundred ninety-seven (94%) patients in the PTM group and 440 (96%) in the NPTM group had labral tears. The tears were repaired in 131 (32.9%) of the patients in the PTM group and 147 (33.4%) in the NPTM group. Labral tears that were fragmented (degenerative) and small flap tears that were not amenable to repair were debrided. In the later years of this study, labral repair rates surpassed 50% in both groups, commensurate with the development of new repair techniques and instrumentation. Microfracture was performed to treat isolated acetabular chondral defects in 16% of the PTM group and 18% of the NPTM group. Osteoplasties were performed to treat cam and/or pincer impingement in 28% of the PTM group and 30% of the NPTM group (Table 1). The Tönnis grades for the radiographic findings in the hips of the PTM and NPTM groups were as follows. None of the patients in either group had grade 3 or 4 changes. Grade 1 changes were observed in 245 (58%) patients in the PTM group and 252 (55%) in the NPTM group, and grade 0 changes were observed in 177 (42%) and 206 (45%) of the PTM and NPTM groups, respectively. No significant differences were noted between the number and types of procedures performed or in the Tönnis grades of the PTM and NPTM groups.

Outcome Assessment

All of the 880 patients included in this study were assessed with the Byrd 100-point modified Harris Hip Score (mHHS) preoperatively¹; 709 patients (81%) were assessed at 3, 6, and 12 months after surgery; and 669 patients (76%) were assessed at 24 months. Differences in the clinical outcomes of the PTM and NPTM groups were assessed by comparing each group's 3-, 6-, 12-, and 24-month postoperative mHHS. Thus, the postoperative comparisons included the 338 PTM and the 371 NPTM patients (81%) who had scores recorded at their 3-, 6-, and 12-month postoperative visits and the 320 PTM and

349 NPTM patients (76%) who also had mHHS recorded at their 24-month postoperative visit. The study did not include comparisons of scores at longer follow-up intervals because most of these patients were referred for their hip arthroscopy and the majority did not return for follow-up visits 24 months after surgery. Similarly, management of the patients' postoperative medications was handled by their primary care physicians, and thus the patients' charts at the senior author/surgeon's institution did not contain accurate information regarding the status of patients' PTM use at their postoperative visits.

Data Analysis

For this study, the primary outcomes evaluated were whether a patient was taking a PTM and whether the demographic data and mHHS differed for the patients taking a PTM versus those not. Thus, *t* tests were performed at a level of significance of $P < .05$ to determine whether there were significant differences in age, sex, body mass index, and operative side for the PTM and NPTM groups. A *t* test also was performed to determine whether significant differences were present in the pre- and postoperative mean mHHS for the PTM and NPTM groups. Repeated-measures analyses of variance were used for data analysis and comparison of the types and numbers of operative procedures performed, with $P < .05$ defined as significant.

Before this study was initiated, appropriate institutional review board approval was obtained, and the study was performed in compliance with the Health Insurance Portability and Accountability Act.

RESULTS

A total of 880 charts were reviewed, and the patients were separated into 2 groups based on whether they were taking a PTM (PTM group) or not (NPTM group) at the time of their hip arthroscopy. Based on this criterion, there were 422 patients in the PTM group and 458 in the NPTM group. The number and percentages of patients taking PTMs at the time of their hip arthroscopy are summarized by year in Table 2.

Four hundred twenty-two (48%) of the 880 patients reviewed were taking at least 1 PTM, and 280 patients (32%) were taking 2 or more PTMs at the time of their hip arthroscopy. Of the 422 patients taking PTMs, 354 patients were taking antidepressants; 258 patients were taking ADHD, antianxiety, or mood-stabilizing medications; and 46 patients were taking antipsychotic medications. Thus, of the 880 patients studied, 40% were taking antidepressants; 29% were taking ADHD, antianxiety, or mood-stabilizing medications; and 11% were taking anti-psychotic medications. In contrast, the percentages of adults in the United States taking these same classes of medication were antidepressants, 24%; ADHD, antianxiety, and mood-stabilizing medications, 11%; and antipsychotic medications, 11%.^{10,12}

The demographic data for these 2 groups of patients with regard to age, sex, and body mass index are summarized in Table 3.

Average age of the PTM group was significantly higher than that of the NPTM group (48 vs 35 years, respectively; $P = .02$). The percentage of females in the PTM group (53%) was significantly higher than the percentage of males (38%) and adolescents (23%) in the PTM group. No significant differences were found between the groups in body mass index, percentages of right and left hips undergoing surgery, and the arthroscopic procedures performed (Tables 1 and 3).

The pre- and postoperative mHHS values for the 2 groups of patients are summarized in Table 4. Average preoperative mHHS for the PTM and NPTM groups (41 vs 42 points, respectively) did not significantly differ ($P = .24$). Postoperatively, the PTM group had significantly lower mHHS than the NPTM group at all of the follow-up intervals. Patients in the PTM group had significantly lower 12- and 24-month scores whether they were taking 1 or 2 PTMs (average score, 78 points) or 3 or more PTMs (average score, 76 points) at the time of their hip arthroscopy. The PTM group had consistently lower scores than the NPTM group in the categories of pain (no pain = a maximum of 40 points) and distance walked (unlimited distance = a maximum of 10 points). The PTM and NPTM groups averaged 28 vs 38 points in the Pain category and 5 vs 8 points in the Distance Walked category, respectively. These scores indicated that the average patient in the PTM group had moderate postoperative pain and could walk only 2 to 3 blocks.

Results in Adolescents

As noted previously, the PTM and NPTM groups were further stratified based on whether the patients were adolescents (ages 12–19) or adults. This additional data point was created to determine whether the percentage of adolescent patients undergoing hip arthroscopy while taking PTMs was similar to the percentage of adolescents (6.3%) in the United States taking PTMs.⁶ The results of this analysis indicated that 21 (23%) of the 92 adolescents were taking 1 or more PTMs at the time of their hip arthroscopy. Specifically, 11 adolescents (58%) were taking 1 PTM, 3 adolescents (16%) were taking 2 PTMs, 4 adolescents (21%) were taking 3 PTMs, 2 adolescents were taking 4 PTMs, and 1 adolescent was taking 5 PTMs. In contrast, only 6.3% of the general population of adolescents in the United States were taking PTMs during the years encompassed by this study.⁶

Preoperative mHHS for the adolescent PTM and NPTM patients (37.2 vs 40.2 points, respectively) did not significantly differ ($P = .37$). Similarly, the scores of the PTM and NPTM adolescents obtained at 3 months (92.5 vs 88.9 points), 6 months (92.1 vs 90.3 points), 12 months (89.5 vs 92.1 points), and 24 months (90.3 vs 90.1 points) after surgery did not significantly differ (Table 5).

DISCUSSION

To our knowledge, this is the first study to document the incidence of PTM use in a large series of patients undergoing hip arthroscopy and to assess the outcomes of patients taking PTMs at the time of their hip arthroscopy. We determined that 48% (422) of our 880 patients undergoing hip arthroscopy were taking 1 or more PTMs at the time of their hip arthroscopy. This result is similar to that of a recent study that evaluated the effect of PTMs on a military population of 93 active-duty patients who had undergone arthroscopic femoroacetabular

impingement surgery.² That study found that 37 patients (40%) were taking PTMs and that “Mental health medication use is associated with poorer outcome scores, and significantly lowers the possibility of returning to active-duty status.”² The 2-year mHHS values of the active-duty patients taking PTMs compared with the patients not taking PTMs were significantly lower (59 vs 69 points, respectively). Our study also found that the PTM group had poorer postoperative mHHS than the NPTM group. Specifically, the 6-month (72 vs 89 points) 12-month (77 vs 91 points), and 24-month mHHS (79 vs 88 points) results were significantly lower in the PTM group. In both studies, the preoperative use of PTMs was double (40%–48% vs 20%) that reported for adults in the United States.^{10,12} However, in both studies, each patient’s postoperative use of PTMs could not be documented.²

In 2007, Paulose-Ram et al¹² determined that the overall use of PTMs by US adults was 11.1%. The use of PTMs by class was antidepressants 8%; anxiolytic/sedative/hypnotic (mood stabilizers) 4%; and antipsychotics 1.0%. The authors reported that between 1994 and 2002, the use of PTMs among noninstitutionalized US adults had doubled. The authors found that this increase was driven by a more than 3-fold increase in antidepressant use, while the frequency of use for the other classes of PTMs remained the same. The results of the current study also reflect this trend in that 354 (40%) of the total group of 880 patients studied, and 84% of the 422 patients taking PTMs, were taking an antidepressant medication.

Determining the reasons for this 3-fold increase in the use of antidepressants was the focus of several recent studies.^{8,9,14} Mojtabai and Olfson⁹ noted that during the past 2 decades, antidepressants have become the third most commonly prescribed class of medication in the United States. The investigators attributed this phenomenon to the marked increase in the number of antidepressant prescriptions that are being written without a psychiatric diagnosis by nonpsychiatrist providers. Their study found that between 1996 and 2007, the percentage of physician visits at which antidepressants were prescribed without a psychiatric diagnosis increased from 59% to 72%.⁹ Maust et al⁸ analyzed a cohort of noninstitutionalized older adults who had recently started taking an antidepressant, anti-anxiety, or antipsychotic drug and reported that 48% of the patients did not meet criteria for a mental disorder.

Wiechers et al¹⁴ performed a database study and found that in 2009, 5.1 million individuals filled prescriptions for PTMs: 64% were female, 40% were between the ages of 50 and 64, and 58% (~3 million) had no documented psychiatric diagnosis or disorder. The results of our study are similar to those of Wiechers et al¹⁴ in that the average age (48 years) and the percentage of females (53%) in our PTM group were significantly older than the average age (35 years) and percentage of females (38%) in our NPTM group. These findings suggest that on average, the patient-reported outcome (PRO) scores for male patients undergoing hip arthroscopy may be higher than those of their female counterparts because fewer males are taking PTMs at time of their hip arthroscopy.

One reason for the significantly older age of the PTM group may be that older patients often have medical conditions (eg, heart disease, diabetes, chronic hip pain) that are associated with depression, and although depression usually is not these patients’ primary reason for their clinic visit, their comments about their medical condition “getting them down” may

prompt the provider to prescribe an antidepressant.⁹ However, randomized clinical trials have shown that antidepressants have little or no therapeutic effect on the milder forms of depression that are associated with chronic medical conditions.^{3,7} These patients would be better served by being referred for treatment of the medical problem causing their depression (eg, chronic hip pain), rather than being treated for the depression associated with their medical problem.⁹

The significantly lower PRO scores (mHHS) observed in the PTM group may be due in part to the side-effect profile of PTMs. Specifically, newer antipsychotic medications tend to cause metabolic problems such as obesity and type 2 diabetes, and all antipsychotic and antidepressant medications increase the likelihood of sedation, sexual dys-function, postural hypotension, cardiac arrhythmia, and sudden death.¹¹ The side effects of mood-stabilizing medications (eg, lithium) include decreased white blood cell production, tremors, headaches, blurred or double vision, weight gain, and decreased cognition. Antianxiety medications (eg, diazepam) can produce decreased cognition, addiction, withdrawal syndrome, tremors, and rebound anxiety, and stimulant medications (eg, Adderall) can cause anxiety, irritability, insomnia, psychosis, and paranoia.¹³ Any 1 of these adverse side effects could have directly and adversely affected the PTM group's postoperative PRO score (mHHS).

On the basis of the current findings, our evaluation of patients referred for hip arthroscopy now includes an assessment of their use of PTMs. This assessment focuses on identification of the diagnoses for which the PTM was prescribed and a determination of how long patients have been taking the medication. If a patient has not seen within the past year the physician who prescribed the PTM, we refer the patient back to the prescribing physician to (1) discuss the goals and results of PTM use, (2) alert the physician that hip arthroscopy is being considered, and (3) suggest that an interventional program to improve the patient's mental health may be beneficial and may improve his or her outcome. If hip arthroscopy is scheduled, we order a preoperative consultation with anesthesia regarding perioperative management of PTMs. This is done because certain PTMs may increase anesthetic requirements.^{5,13} After surgery, if the 3- or 6-month score of a patient who is taking a PTM is in the range of 70 to 75 points, we reassess the hip regarding any residual hip abnormality (eg, femoroacetabular impingement), but we also ask the patient to consult with the physician who prescribed the PTM regarding its effectiveness and the current indications for its use.

Study Strengths and Limitations

The strengths of this cohort study are that it is a large, consecutive series of patients (1) who underwent hip arthroscopy performed by the same surgeon, (2) who had a minimum postoperative follow-up of 24 months, (3) and whose outcomes were prospectively evaluated with the Byrd mHHS. A fourth strength is that the 2 cohorts of patients proved to be well matched: the PTM and NPTM groups contained similar percentages of patients, and no significant differences were noted in the demographic data, the preoperative mHHS, and the number and types of arthroscopic procedures performed in the 2 cohorts. The main limitations of this study are that (1) it is a retrospective review of the data on this case series of patients; (2) all of the patients had several arthroscopic procedures performed, which

could have been responsible, in part, for the outcomes; and (3) only 1 PRO measure was used. We are aware that, to date, no conclusive evidence is available to support the use of a single PRO questionnaire for patients undergoing hip arthroscopy. However, the Byrd mHHS was the main validated PRO available when the earliest patients in this study underwent hip arthroscopy, and more contemporary PRO questionnaires were not available for use in these patients. Thus, the mHHS was the PRO used for all of the patients included in this study to maintain consistency of the reported data.

CONCLUSION

The incidence of PTM use in this series of 880 patients undergoing hip arthroscopy was 3 times that reported for adults (48% vs 17%) and adolescents (23% vs 6.3%) in the United States, and the 12- and 24-month mHHS values of the PTM group were significantly lower than those observed in patients who were not taking PTMs at the time of their hip arthroscopy. These results suggest that hip arthroscopy candidates taking PTMs are at significantly greater risk for poorer outcomes and that their use of PTMs should be identified and addressed before proceeding with hip arthroscopy.

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TABLE 1

Hip Arthroscopic Procedures Performed in the PTM and NPTM Groups

Arthroscopic Procedures ^a	PTM Group, n = 422 ^b	NPTM Group, n = 458 ^b	P Value
Debridement of a labral tear	266 (63)	293 (64)	.40
Repair of a labral tear	131 (31)	147 (33)	.24
Debridement of an articular flap	68 (16)	55 (12)	.10
Partial synovectomy	84 (20)	82 (18)	.20
Loose body removal	34 (8)	28 (6)	.20
Microfracture	68 (16)	82 (18)	.24
Osteoplasty for femoroacetabular impingement	118 (28)	137 (30)	.10
Excision of torn ligamentum teres	8 (2)	9 (2)	.60
No. of procedures per patient (average)	1.84	1.81	.20

^aMany patients underwent more than 1 arthroscopic procedure during their arthroscopic surgery, and all of the procedures were performed at the time of their hip arthroscopy.

^bValues expressed as n (%) except for the last row. NPTM, patients who were not taking a psychotropic medication; PTM, patients who were taking a psychotropic medication.

TABLE 2

Numbers and Percentages of PTMS, NPTMs, and Percentages of US Adults Taking PTMs During the Years of the Study

Years	Total Patients, n	PTM Group, n	NPTM Group, n	PTM Group, % of Total	US Adults Taking PTMs, % ^b
2004	20	7	13	35	8
2005	50	21	29	42	8
2006	73	28	45	39	9
2007	96	38	58	40	10
2008	102	46	56	46	11
2009	134	68	66	51	12
2010	166	83	83	50	14
2011	155	81	74	52	14
2012	84	50	34	60	17
Totals	880	422	458	48	

^aNPTM, patients who were not taking a psychotropic medication; PTM, patients who were taking a psychotropic medication.

^bData from Frenk et al.,⁴ Moore and Mattison,¹⁰ and Paulose-Ram et al.¹²

TABLE 3

Comparison of Demographic Data for the PTM and NPTM Groups^a

Category	PTM Group	NPTM Group	P Value
Average age, y	48	35	.02
Males, n (%)	106 (38)	176 (62)	.01
Females, n (%)	316 (53)	282 (38)	.02
Adolescents, n (%) ^b	21 (23)	71 (77)	.001
Body mass index	25.5	25.9	.20
Right hip, n (%)	244 (58)	256 (56)	.24
Left hip, n (%)	178 (42)	202 (44)	.10

^aThe only significant differences between the 2 groups were the higher average age and the percentage of female patients in the adult PTM group. NPTM, patients who were not taking a psycho-tropic medication; PTM, patients who were taking a psychotropic medication.

^bAdolescents were defined, as in prior PTM studies, as patients who were 12 to 19 years of age.⁶

TABLE 4

Pre- and Postoperative Modified Harris Hip Scores for the PTM and NPTM Groups

Time Point	PTM Group ^a	NPTM Group ^a	P Value
Preoperative ^b	41 ± 14.7	42 ± 12.3	.24
3 months ^c	76 ± 16.3	86 ± 16.6	.02
6 months	72 ± 15.4	89 ± 12.9	.001
12 months	77 ± 13.3	91 ± 13.8	.001
24 months ^d	79 ± 17.0	88 ± 12.1	.01

^aValues are given as mean ± SD. NPTM, patients who were not taking a psychotropic medication; PTM, patients who were taking a psychotropic medication.

^bPreoperative Modified Harris Hip Score values were available for all 880 patients studied.

^cThe 3-, 6-, and 12-month postoperative scores were available for 338 (80%) of the PTM patients and 371 (81%) of the NPTM patients.

^dThe 24-month scores were available for 320 (76%) of the PTM patients and 349 (76%) of the NPTM patients.

TABLE 5

Pre- and Postoperative Modified Harris Hip Scores for the 21 PTM and 71 NPTM Adolescent Patients

Time Point	PTM Adolescents ^a	NPTM Adolescents ^a	P Value
Preoperative	37.2 ± 11.6	40.2 ± 13.7	.37
3 months	92.5 ± 8.95	88.9 ± 12.9	.30
6 months	92.1 ± 9.7	90.3 ± 11.4	.55
12 months	89.5 ± 12.2	92.1 ± 9.1	.34
24 months	90.1 ± 10.7	90.3 ± 12	.95

^aValues given as mean ± SD. NPTM, adolescents who were not taking a psychotropic medication; PTM, adolescents who were taking a psychotropic medication.