

Evaluation of Differences Between Non-Hispanic White and African American Patients With Sports Medicine–Related Hip Disabilities

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Investigation performed at Cleveland Clinic, Cleveland, Ohio, USA

Background: Racial disparities within the field of orthopaedics are well-documented in the spinal surgery, knee arthroplasty, and hip arthroplasty literature. Not much is known about racial differences in patients with sports medicine–related hip disabilities.

Purpose: To investigate whether differences exist between African American and non-Hispanic White (White) patients evaluated for hip disabilities.

Study Design: Cross-sectional study; Level of evidence, 3.

Methods: We performed a multicenter retrospective cohort study of 905 patients who were evaluated over a 1-year period for hip-related orthopaedic concerns. Patient demographic data, disability characteristics, and hip radiographic findings were obtained from electronic medical records. We also obtained data on whether patients were offered physical therapy, magnetic resonance imaging (MRI), and/or surgery. Comparisons by race and insurance status were evaluated using univariate and multivariate analyses.

Results: African Americans comprised a significantly lower proportion of the patients evaluated for hip-related disabilities compared with Whites (6.5% vs 93.5%; $P < .001$). A significantly smaller proportion of African Americans with hip disabilities was recommended for surgery than White patients (35.6% vs 54.6%; $P = .007$). Cam deformities were more common in White vs African American patients (39.7% vs 23.7%; $P = .021$), as were labral tears (54.1% vs 35.6%; $P = .009$). Logistic regression demonstrated that neither race nor insurance status were significant determinants in surgery recommendations. Conversely, race was a determinant of whether an MRI was performed, as White patients were 2.74 times more likely to have this procedure. There were no differences with respect to obtaining an MRI between private and Medicaid insurance.

Conclusion: Compared with White patients, there were differences in both the proportion of African Americans evaluated for hip-related disabilities and the proportion receiving a surgery recommendation. African Americans with sports medicine–related hip issues were also less likely to obtain an MRI. With regard to observed pathology, African American patients were less likely to have cam deformities and labral tears than White patients.

Keywords: racial disparities; hip; femoroacetabular impingement; hip arthroscopy; sports medicine

Racial disparities with respect to outcomes as well as access to care have been extensively investigated in both medicine and surgery. Outside the field of orthopaedics, racial disparities have been well-documented with respect to the care received after an ischemic stroke,¹⁵ the outcomes of coronary artery bypass grafting surgery,²⁰ and the outcomes of surgical revascularization for limb salvage.²² Similarly, disparities have also been reported within orthopaedics.

Numerous studies have documented racial disparities with regard to the utilization and outcomes of total ankle arthroplasty, total knee arthroplasty, total hip arthroplasty, and total elbow arthroplasty.[#] This was demonstrated in a study by Singh et al²⁵ that evaluated 18 years of national Medicare data pertaining to total knee arthroplasty and total hip arthroplasty and found that African American patients experienced worse outcomes than their non-Hispanic White (White) counterparts, with longer hospital

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lengths of stay and all-cause readmission rates, and were less likely to be discharged home. Furthermore, the Singh et al study showed that over the 18-year study period, the racial disparities did not improve.

Hip arthroscopy is a promising treatment for patients with varying hip disabilities, including femoral acetabular impingement (FAI) syndrome, labral tears, intra-articular loose bodies, synovitis, cartilage lesions, and septic arthritis.^{29,30} It is associated with less pain, better quality of life, and better scores on sports-related outcome measures for patients with FAI.^{7,18} The current literature pertaining to racial disparities in orthopaedic surgery have mainly focused on total joint arthroplasty due to the existing large Medicare databases. Due to the lack of national sports medicine databases, evaluation of health care disparities in sports medicine is difficult to assess. For years, the senior authors (J.T.R. and S.K.) have noted anecdotally that the proportion of African American patients evaluated in the training room as well as at the office with hip-related orthopaedic concerns was very different from the proportions seen for shoulder and knee issues. To confirm this anecdotal observation, we wished to formally investigate whether there were actual differences in the proportion of African American patients evaluated for hip disabilities compared with shoulder and knee disabilities. To our knowledge, no study has evaluated for racial differences with respect to the presentation and subsequent referral for surgery as it pertains to hip arthroscopy. As the indications for hip arthroscopy continue to expand, it is important for physicians to understand if racial disparities exist in order for physicians to eliminate discrepancies in the care patients receive, improve access to care, and improve patient education pertaining to their pathology.

The purpose of this multicenter study was to evaluate for the presence of racial differences with respect to patients evaluated for hip-related disabilities. We hypothesized that the number of African Americans with hip disabilities would be far less than their White counterparts. We also hypothesized that African Americans evaluated for orthopaedic-related hip issues would be referred for surgery at a lower rate compared with White patients.

METHODS

The protocol for this study received institutional review board approval. We performed a retrospective cohort study

TABLE 1
Racial Breakdown of the Overall Patient Population at the Participating Institutions^a

Race	Saint Louis University	Cleveland Clinic
White	135,240 (54.1)	3,579,379 (79.6)
African American	78,773 (31.5)	676,784 (15.1)
Asian	3537 (1.4)	116,758 (2.6)
American Indian/Alaska Native	443 (0.2)	34,287 (0.8)
Native Hawaiian/Pacific Island	302 (0.1)	4273 (0.1)
Not listed	28,266 (11.3)	84,782 (1.9)
Unavailable	2261 (1.3)	NA
Total	248,822 (100.0)	4,496,263 (100.0)

^aData are presented as n (%). NA, not available.

of consecutive patients evaluated for hip, knee, and shoulder orthopaedic issues at 2 academic medical centers (Saint Louis University and Cleveland Clinic) over a 1-year period. The multicenter format was chosen to avoid bias of analyzing a single institution's patient population. Patient race was obtained from the electronic medical record (EMR). The overall racial demographics of the patient populations served by the 2 institutions are presented in Table 1.

We included all African American and White patients who were evaluated by 2 sports medicine surgeons (J.T.R. and S.K.) who specialize in hip arthroscopy. In addition to patients with hip disabilities, we elected to include knee and shoulder patients in order to compare the rates for hip vs shoulder/knee disabilities in African American and White patients. This was intended to serve as an internal control, as it pertains to the rate at which all patients are being referred. Within the 2 racial groups, we excluded patients without hip, knee, or shoulder disability; those without radiographs; those with pending surgical recommendations; and those with insurance documented as self-pay or other (eg, workers' compensation). Self-pay patients were excluded due to low numbers. Workers' compensation patients were excluded due to potential for alternative motivations regarding treatment.

Of 3873 patients who were initially included, 2789 were ultimately enrolled in the study. The data were deidentified and exported to the Research Electronic Data Capture

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Ethical approval for this study was obtained from Saint Louis University (protocol No. 27702) and Cleveland Clinic (protocol No. 16766).

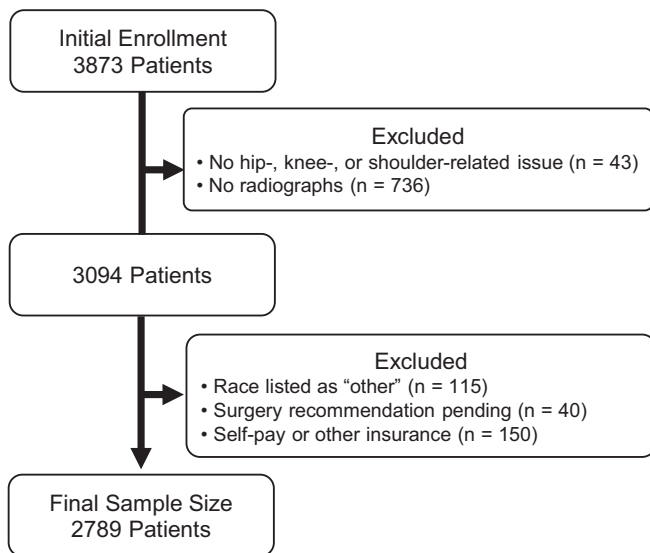


Figure 1. Flowchart of patient enrollment in study.

(REDCap) system. Figure 1 provides a flowchart of the patient enrollment process.

Data Collection

Baseline patient demographics (eg, age, body mass index [BMI], sex, race, and insurance status) were obtained from the EMR and manually entered into REDCap. We recorded the following study variables: weeks from initial visit to surgery (ie, hip arthroscopy), whether physical therapy or surgery was recommended, radiographic findings (eg, cam/pincer deformity, arthritis), whether a magnetic resonance imaging (MRI) was performed, and any MRI findings (eg, labral tear or chondral damage). MRIs ordered by either the referring physicians or the sports medicine surgeon specializing in hip arthroscopy were included. All radiographic findings were reviewed by the attending surgeons (S.K. and J.T.R.) and obtained from documentation in office notes. All office notes were reviewed so as to document and confirm surgeon plans and recommendations.

Statistical Analysis

Demographic statistics were summarized by joint location (hip, knee, or shoulder). Continuous variables such as age, BMI, and weeks from initial visit to surgery were displayed using medians and interquartile range (IQR). Categorical variables were displayed using counts and percentages. In addition to basic demographics summary, we also compared joint disability by race using chi-square tests. To further evaluate racial disparities in patients with hip disability, we conducted a series of univariate tests (Wilcoxon tests for continuous variables; chi-square or Fisher exact tests for categorical variables) to compare demographics and clinical variables between African American and White patients. The study obtained information for

other races, but due to low numbers, we did not include them in the analysis.

To identify key drivers of surgery recommendation or whether MRI was performed, logistic regression models were built. Predictor variables were chosen a priori by clinicians based on their knowledge on what could be related to surgery recommendation or MRI. The variables in the model included age, sex, race, insurance, physical therapy (PT) recommended (yes/no), radiographic findings, MRI findings, and race \times insurance interaction. Model results were shown using odds ratios (ORs) and 95% CIs. Nomograms were provided to help visualize the scale and directionality of parameter effects. $P < .05$ was considered significant. Statistical analysis was performed using R software (Version 3.5.0; R Foundation for Statistical Computing).

RESULTS

Baseline Sample Characteristics by Joint Location and Race

The 2789 study patients comprised 905 with hip-related, 960 with knee-related, and 924 with shoulder-related disabilities. Table 2 presents the descriptive characteristics according to joint location. Female patients comprised 64.9% of those with hip disabilities. The proportion of hip patients who were African American (6.52%) was significantly lower than the proportion of knee (40.9%) and shoulder (34%) patients who were African American ($P < .001$) (Table 3). Of the 905 patients with hip disabilities, African Americans comprised a significantly lower proportion than Whites ($n = 59$ [6.5%] vs $n = 846$ [93.5%], respectively; $P < .001$). While African Americans comprised only 6.5% of the patients with hip disabilities, they consisted of 31.5% and 15.1% of the total patients at each institution (Table 1). With regard to insurance status, most patients with hip disabilities had private insurance (75.6%).

Surgical and Diagnostic Recommendations by Race/Insurance Status

The proportion of African American patients who were recommended for surgery is significantly lower than the proportion of White patients who were recommended for surgery (35.6% vs 54.6%; $P = .007$) (Table 4). The insurance distribution also varied by race, with the proportion of African American patients with private insurance being statistically smaller than that of White patients (52.5% vs 77.2%; $P < .001$). The proportion of White patients with cam deformities identified radiographically was statistically higher than that of African Americans (39.7% vs 23.7%; $P = .021$). With regard to the likelihood of having an MRI performed, 73% of Whites had an MRI, compared with 44% of African Americans ($P < .001$). In addition, Whites were more likely to have labral tears identified on MRIs (54.1% vs 35.6%; $P = .009$).

Logistic regression modeling demonstrated that race and insurance are not significant drivers of the odds of surgery

TABLE 2
Descriptive Statistics of the Study Population (N = 2789)^a

Variable	Hip (n = 905)	Knee (n = 960)	Shoulder (n = 924)
Age, y	42.0 [30.0-54.0]	30.0 [16.0-47.0]	52.0 [36.0-60.0]
BMI, kg/m ² (n = 721) ^b	26.0 [23.0-29.9]	NA	NA
Sex			
Male	318 (35.1)	439 (45.7)	480 (51.9)
Female	587 (64.9)	521 (54.3)	444 (48.1)
Race			
African American	59 (6.5)	393 (40.9)	314 (34.0)
White	846 (93.5)	567 (59.1)	610 (66.0)
Insurance			
Private	684 (75.6)	281 (29.3)	235 (25.4)
Medicaid	80 (8.8)	86 (9.0)	253 (27.4)
Medicare	141 (15.6)	593 (61.8)	436 (47.2)
Weeks from initial visit to surgery (n = 663) ^b	11.0 [4.0-22.0]	5.00 [3.0-10.0]	8.50 [3.0-21.8]
Surgery recommended?			
Yes	483 (53.4)	149 (15.5)	151 (16.3)
No	422 (46.6)	811 (84.5)	773 (83.7)
PT recommended? (n = 2782) ^b			
Yes	650 (71.9)	787 (82.3)	802 (87.0)
No	254 (28.1)	169 (17.7)	120 (13.0)
Radiographic findings			
Cam deformity			
No	555 (61.3)	960 (100.0)	924 (100.0)
Yes	350 (38.7)	0 (0.0)	0 (0.0)
Pincer deformity			
No	795 (87.8)	960 (100.0)	924 (100.0)
Yes	110 (12.2)	0 (0.0)	0 (0.0)
Arthritis			
No	550 (60.8)	960 (100.0)	923 (99.9)
Yes	355 (39.2)	0 (0.0)	1 (0.1)
MRI performed? (n = 2773) ^b			
Yes	644 (71.2)	265 (27.7)	233 (25.5)
No	261 (28.8)	690 (72.3)	680 (74.5)
MRI findings			
Labral tear			
No	426 (47.1)	960 (100.0)	924 (100.0)
Yes	479 (52.9)	0 (0.0)	0 (0.0)
Chondral damage			
No	855 (94.5)	960 (100.0)	924 (100.0)
Yes	50 (5.5)	0 (0.0)	0 (0.0)

^aData are presented as median [interquartile range] or n (%). BMI, body mass index; MRI, magnetic resonance imaging; NA, not available; PT, physical therapy.

^bThe n values represent the number of patients for which the data was available/collected from the EMR.

TABLE 3
Joint Disabilities by Race^a

Variable	Hip (n = 905)	Knee (n = 960)	Shoulder (n = 924)	P Value
African American	59 (6.5)	393 (40.9)	314 (34.0)	Hip vs knee: <.001 ; hip vs shoulder: <.001 ; knee vs shoulder: .002
White	846 (93.5)	567 (59.1)	610 (66.0)	
P value	<.001	NS	NS	

^aData are presented as n (%). Bolded P values indicate statistically significant difference between groups compared (P < .05). NS, nonsignificant.

being recommended (Table 5). Female sex was associated with higher odds of having surgery recommended (OR, 1.52; 95% CI, 1.11-2.1; P = .01). Other factors associated

with a higher likelihood of a surgical recommendation were having a cam deformity (OR, 1.66; 95% CI, 1.19-2.3; P = .003) or a labral tear (OR, 3.45; 95% CI, 2.53-4.72;

TABLE 4
Surgery Recommendations by Race (Hip Disabilities)
(n = 905 Patients)^a

Variable	African American (n = 59)	White (n = 846)	P Value
Surgery recommended?			.007
Yes	21 (35.6)	462 (54.6)	
No	38 (64.4)	384 (45.4)	
Age, y	40.0 [19.5-50.0]	42.0 [31.0-54.0]	.074
Sex			.104
Male	27 (45.8)	291 (34.4)	
Female	32 (54.2)	555 (65.6)	
Insurance			<.001
Private	31 (52.5)	653 (77.2)	
Medicaid	12 (20.3)	68 (8.0)	
Medicare	16 (27.1)	125 (14.8)	
Weeks from initial visit to surgery (n = 396)	6.50 [4.8-18.2]	11.0 [4.0-22.0]	.485
PT recommended? (n = 904)			.381
Yes	39 (66.1)	611 (72.3)	
No	20 (33.9)	234 (27.7)	
Radiographic findings			
Cam deformity			.021
No	45 (76.3)	510 (60.3)	
Yes	14 (23.7)	336 (39.7)	
Pincer deformity			.892
No	51 (86.4)	744 (87.9)	
Yes	8 (13.6)	102 (12.1)	
Arthritis			.466
No	39 (66.1)	511 (60.4)	
Yes	20 (33.9)	335 (39.6)	
MRI performed?			<.001
Yes	26 (44.1)	618 (73.0)	
No	33 (55.9)	228 (27.0)	
MRI findings			
Labral tear			.009
No	38 (64.4)	388 (45.9)	
Yes	21 (35.6)	458 (54.1)	
Chondral damage			.766
No	57 (96.6)	798 (94.3)	
Yes	2 (3.4)	48 (5.7)	

^aData are presented as median [interquartile range] or n (%). Bolded P values indicate statistically significant difference between groups (P < .05). MRI, magnetic resonance imaging; PT, physical therapy.

P < .001) diagnosed on radiographs or MRI, respectively (Figure 2). Patients who had previously been recommended for PT had lower odds of a surgical recommendation compared with patients with no previous PT recommendation (OR, 0.59; 95% CI, 0.42-0.83; P = .002).

Logistic regression models demonstrate that having a cam deformity on plain radiographs was associated with higher odds of having an MRI performed (OR, 2.5; 95% CI, 1.72-3.63; P < .001) (Table 6). Both race and insurance were significant variables of having an MRI performed (Figure 3). White patients had 2.74 times the odds of having an MRI performed compared with African Americans (OR, 2.74; 95% CI, 1.26-5.96; P = .011). Patients with Medicare

TABLE 5
Logistic Regression Model Results, Modeling Odds of Surgery Recommendation^a

Variable	Odds Ratio (95% CI)	P Value
Intercept	0.60 (0.24-1.51)	.281
Age	0.99 (0.98-1.00)	.1
Sex: female sex (vs male)	1.52 (1.11-2.10)	.01
Race: White (vs African American)	1.44 (0.65-3.21)	.373
Insurance		
Medicaid (vs private)	1.40 (0.32-6.08)	.652
Medicare (vs private)	0.13 (0.01-1.23)	.075
Previous PT recommendation	0.59 (0.42-0.83)	.002
Radiographic findings		
Cam deformity	1.66 (1.19-2.30)	.003
Pincer deformity	1.52 (0.92-2.50)	.099
Arthritis	0.82 (0.58-1.17)	.279
MRI findings		
Labral tear	3.45 (2.53-4.72)	<.001
Chondral damage	1.28 (0.66-2.47)	.46
Race × insurance		
White/Medicaid	1.21 (0.25-5.85)	.815
White/Medicare	5.74 (0.60-55.3)	.13

^aBolded P values indicate statistical significance. MRI, magnetic resonance imaging; PT, physical therapy.

insurance had about one-fifth the odds of having an MRI performed vs patients with private insurance (OR, 0.22; 95% CI, 0.05-0.98; P = .047).

DISCUSSION

The principal finding of this study demonstrated that there are race-based differences in patients evaluated by a hip arthroscopy specialist with hip-related concerns. Specifically, a significantly lower proportion of patients with hip disabilities included African Americans (6.5% African American vs 93.5% White; P < .001) compared with shoulder patients (34% African American vs 66% White) or knee patients (40.9% African American vs 59.1% White). Furthermore, African American patients with hip disabilities had a lower proportion of MRIs performed (44.1% vs 73%; P < .001) and were recommended surgery at a lower proportion (35.6% vs 54.6%; P = .007) compared with their White counterparts. Interestingly, logistic regression modeling demonstrated that race was not a significant driver of surgery recommendations (OR, 1.44; 95% CI, 0.65-3.21; P = .373). Labral tears and cam deformities, which were associated with higher odds of having surgery recommended (OR, 3.45; 95% CI, 2.53-4.72; P < .001; and OR, 1.66; 95% CI, 1.19-2.3; P = .003, respectively), were more common in White patients.

To our knowledge, this is the first study to demonstrate racial differences in patients evaluated by a hip arthroscopy specialist with hip disabilities. The patient population represented in our study reflects a diverse group from laborers to athletes, as reflected from the median ages of each cohort. Hip arthroscopy is proving to be a promising, cost-effective treatment option for patients with FAI and

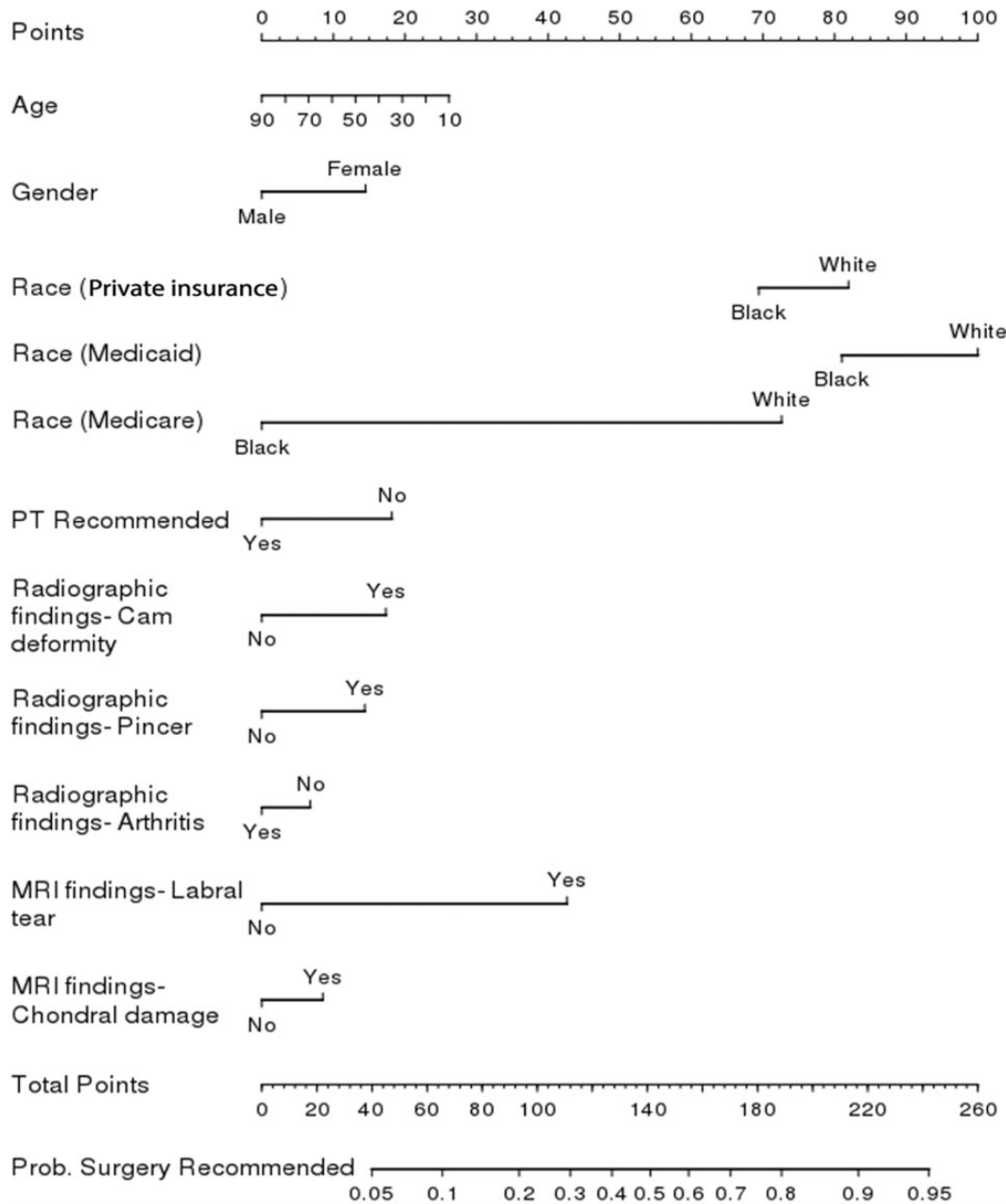


Figure 2. Modeling probability of surgery recommendation. MRI, magnetic resonance imaging; PT, physical therapy.

labral tears.^{12,19} Due to the nature of sports medicine, studying racial disparities is inherently difficult. Most of the orthopaedic studies evaluating racial disparities are in total joint replacement and spine surgery due to the national registries and Medicare databases that are available for research. Within the United States, there is a lack of national databases available for sports medicine research, which contributes to the difficulty of studying health care disparities in sports medicine. As the indications for hip arthroscopy continue to grow, it is important for practitioners to understand if any disparities exist to decrease delays in care and potential discrepancies in care.¹¹

Several studies have outlined racial disparities in joint arthroplasty. A study by Singh et al²⁵ evaluating racial disparities in total knee and total hip arthroplasty over an 18-year period found that despite African Americans' having a higher prevalence of osteoarthritis, they had a lower usage rate for primary and revision knee and hip arthroplasty. Similar disparities of utilization have been found in total ankle arthroplasty, total elbow arthroplasty, and total shoulder arthroplasty.²⁶⁻²⁸ Our finding of lower rates of African American patients with hip disabilities compared with knee and shoulder disabilities is in concordance with the lower utilization rates found in other fields. In the field of total joint replacement, several theories

TABLE 6
Logistic Regression Model Results, Modeling Odds Having
an MRI Performed^a

Variable	Odds Ratio (95% CI)	P Value
Intercept	0.48 (0.20-1.20)	.116
Age	1.00 (0.99-1.02)	.434
Sex: female (vs male)	2.17 (1.55-3.04)	<.001
Race: White (vs African American)	2.74 (1.26-5.96)	.011
Insurance		
Medicaid (vs private)	1.08 (0.27-4.37)	.913
Medicare (vs private)	0.22 (0.05-0.98)	.047
Previous PT recommendation	1.07 (0.76-1.52)	.686
Radiographic findings		
Cam deformity	2.50 (1.72-3.63)	<.001
Pincer deformity	1.72 (0.94-3.12)	.077
Arthritis	0.70 (0.48-1.02)	.063
Race × insurance		
White/Medicaid	0.96 (0.21-4.43)	.963
White/Medicare	1.21 (0.26-5.69)	.809

^aBolded *P* values indicate statistical significance. PT, physical therapy.

attempt to explain the continued disparities in the utilization of total joint arthroplasty. Studies have found that African Americans are more fearful of total joint arthroplasty and have a lower level of expected benefit from the procedure.^{1,14,16} With regard to hip arthroscopy, little is known about African American perception of the potential benefits. Future studies should examine if the reason African Americans are evaluated at a lower rate to a hip arthroscopy specialist than their White counterparts is related to misconceptions about the potential benefit of hip arthroscopy or better explained by anatomic differences between African Americans and Whites.

In a large, multicenter study evaluating the epidemiology of FAI in North America, Clohisey et al⁵ found that 88% of the patients treated for FAI were White, 55% were female, and cam FAI was the most common pathology. Similar to the findings of the aforementioned study, we found that most of our cohort of patients with hip disabilities were female (64.9%), and cam deformity was more common than pincer deformity (38.7% vs 12.2%). Furthermore, our results demonstrated that female sex or the presence of a cam deformity or labral tear was associated with a greater likelihood of having surgery recommended.

Another important conclusion from the current study involves the race-based differences in pathology. When African Americans were evaluated for hip-related issues by a hip arthroscopy specialist, they were less likely to have cam deformities found on radiographs or labral tears on MRI. One explanation for African Americans' having a lower rate of labral tear diagnosis is that they were less likely to have an MRI performed. This finding may be related to anatomic difference, as Whites were more likely to have cam deformities found on radiographs, which was associated with higher odds of MRI recommendation. In addition, in the literature, 3 risk factors are believed to be associated with the development of FAI lesions, including

increased relative femoroacetabular retroversion, decreased femoral neck-shaft angle, and decreased pelvic incidence.^{8,21,31,32}

In a study by Weinberg et al,³³ which examined tibial torsion and femoral anteversion in a large osteological collection, it was demonstrated that on average, African Americans have greater femoral anteversion than Whites. In another study by Weinberg et al³⁴ that investigated pelvic incidences in a large osteological collection, it was also demonstrated that on average, African Americans have a higher pelvic incidence than Whites. As sagittal balance plays an important role in the effective load transfer between the more rigid spine to the mobile lower extremities, it has been hypothesized that patients with decreased pelvic incidence compensate by increasing their anterior pelvic tilt and therefore overcover the anterosuperior pelvic rim.³³ This overcoverage limits the range of motion at the femoroacetabular joint and therefore may predispose patients to FAI.² The greater femoral anteversion and pelvic incidence of African Americans may play a protective role in the development of FAI. Further research should investigate the potential association between the increased femoral version and pelvic incidence of African Americans and its potential protective role in the development of FAI deformities.

In a study by Okike et al²³ examining outcomes after total hip arthroplasty in a universally insured population, minority patients had similar outcomes with regard to rates of lifetime reoperation and 90-day postoperative events compared with Whites when equal access and standardized protocols were used. In the current study, differences existed with regard to the likelihood of having an MRI performed based on race and insurance. It is interesting to note that we found having a labral tear on MRI is associated with higher odds of having surgery recommended, yet Medicare patients had about one-fifth the odds as private insurance patients of having an MRI performed. In our patient population, we found that the proportion of African American patients with private insurance was significantly smaller than that of White patients ($P < .001$). Therefore, the reason African Americans are recommended for an MRI may be explained by limited access to such diagnostic modalities.

Limitations

There are several limitations of this study. One potential bias is that only 2 academic centers were included. While the 2 academic institutions serve diverse populations, it is possible that these findings do not represent national trends. This study is limited to African American and White patients, and therefore, extrapolation to other populations should be performed with caution. Furthermore, only associations can be drawn from this study, not causations. Another limitation of our study is the retrospective manner in which the data were collected. As a result, some patients may have had MRIs inappropriately ordered by referring physicians (eg, primary care providers), which could affect the odds of having an MRI performed. There is the potential for confounding bias due to the retrospective nature of the

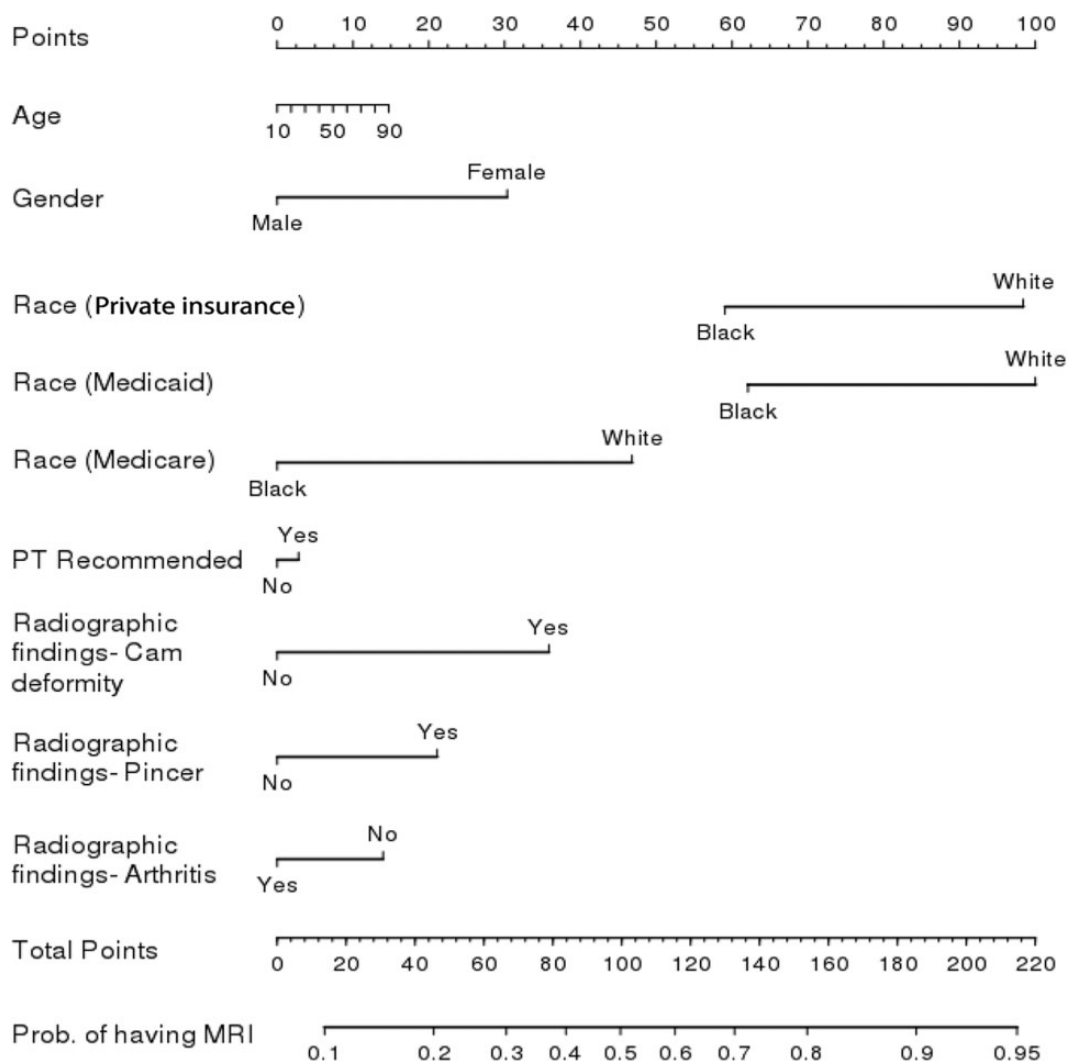


Figure 3. Modeling probability of having an MRI performed. MRI, magnetic resonance imaging; PT, physical therapy.

data collection, as we do not know if some patients were offered surgery or an MRI and chose not to proceed with the recommendation.

CONCLUSION

The results of this study indicated that the proportion of African Americans with hip disabilities is significantly less than that of their White counterparts. Our findings demonstrated that, after being evaluated for hip disabilities, African Americans were less likely to be recommended for surgery or have an MRI performed. Practitioners should take this information into account when caring for diverse populations with hip disabilities.

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