Analysis of the Distribution of Private Research Funding to Orthopaedic Sports Medicine Surgeons

Aakash Shah[1], Robert John Burkhart, Isha Kaushal Shah, Heath Gould[2], Jacob G Calcei, Sabrina Strickland[3], James Everett Voos[4]

[1]Case Western Reserve University School of Medicine, [2]Hospital For Special Surgery, [3]Hospital for Special Surgery, [4]UNIVERSITY HOSPITALS CASE MEDICAL CENTER

INTRODUCTION:

The Physician Payments Sunshine Act was passed as part of the Affordable Care Act in 2010. To promote financial transparency, the Centers for Medicare and Medicaid Services established the Open Payments database (OPD) to track monetary payments between manufacturers and physicians greater than $10 and classifies payments as either general or research payments. Prior studies using OPD have focused on general payments but have yet to examine research payments for sports medicine and predictors of increased research payments. Understanding the pattern of research payments may help uncover potential biases and conflicts of interest, thereby promoting transparency and ethical conduct in orthopaedic research. This study aims to identify trends in private payment distribution among sports medicine orthopaedic surgeon, to explore potential disparities in payment, and predictors for payment.

METHODS:

A cross-sectional analysis of the OPD was conducted from 2015 to 2021 for research payments to orthopaedic sports medicine surgeons. Research payment characteristics were categorized according to their respective orthopaedic subspecialties. All incomplete entries for gender and subspeciality were corrected per the information on the physician's affiliated institution profile. H-index, number of published documents, and years out of training were collected from Scopus and the affiliated institution profile. Descriptive statistics were conducted for payments at the surgeon level. To assess the difference in payments between sex, Wilcoxon rank sum tests were employed. A p-value less than 0.05 was considered statistically significant.

RESULTS:

Over the study period, a total of $81,278,687 in private research payments was reported for orthopaedic sports medicine surgery to 578 unique surgeons at 338 different institutions from 83 different manufacturers. Over the period, sports medicine projects represented a total of 23.33% of all orthopaedic payments growing from 18% in 2015 to 26% in 2021. In 2015, 188 unique sports medicine orthopaedic surgeons received $6,564,985 in private payments growing to 249 surgeons receiving $12,371,178 in 2021 **(Table 1)**. The payment grew at a non-monotonic rate at a Mann-Kendall statistic of 5 (P = 0.548). Male surgeons compromised more than 94% of all orthopaedic sports medicine surgeons per year and collected 98% of the payments (P = 0.011) over the study period. For each year, there was no statistically significant difference in payment between the median male and female payment **(Table 2)**. H-index, the number of published documents, male sex, and the number of years in practice were all significantly associated with an increased amount of private payment in a univariate model (P = <0.001, P = <0.001, P = 0.050, and P = 0.030, respectively). The number of published documents was excluded from the multivariate model due to multicollinearity with H-Index (VIF = 4.84). H-index and the male sex were positively associated with an increased amount of private payment in the multivariate model (P = <0.001 and P = 0.005) **(Table 3)**.

DISCUSSION AND CONCLUSION:

Our analysis found a significant range in the distribution of payments for orthopaedic research, with a small group of surgeons receiving a large number of payments. While there were no significant differences between the median payment to sports medicine orthopaedic surgeons between sex, males received a majority of the funding. Furthermore, H-index and being male were significantly associated with a higher likelihood of receiving a larger number of payments for research from private companies. The gender disparity demonstrated in this study may inspire industry to increase funding to female sports medicine surgeons. These findings offer valuable insights into payment trends and characteristics in orthopaedic sports medicine research, to promote growth and equity in the field.

Year	Number of Surgeons	Number of Male Surgeons (%)	Median (IQR) Payment	Total Payments to Male Surgeons (%)	Total Payments
2015	188	182 (97%)	13,518 (4,375-41,492)	6,410,001 (98%)	6,564,985
2016	206	197 (96%)	17,718 (6,590-38,949)	8,122,242 (98%)	8,281,200
2017	250	237 (95%)	16,405 (5,439-55,035)	13,928,522 (99%)	14,122,126
2018	249	240 (96%)	19,739 (4,901-57,648)	14,191,576 (99%)	14,299,249
2019	268	252 (94%)	14,813 (5,737-51,011)	13,667,868 (98%)	13,990,126
2020	260	247 (95%)	16,432 (4,171-43,574)	11,340,259 (97%)	11,649,823
2021	249	241 (97%)	13,992 (4,802-43,770)	12,270,450 (99%)	12,371,178

*Payments reported as US Dollars

Year	Median (IQR) Payment to Male Surgeons	Median (IQR) Payment to Female Surgeons	Difference in Median Payment	P-Value
2015	13,733 (4,941-41,788)	6,020 (1,281-23,920)	7,713	0.236
2016	17,835 (6,713-39,362)	10,504 (1,960-19,435)	7,331	0.177
2017	16,835 (5,424-57,028)	14,614 (13,836-16,670)	2,221	0.408
2018	21,517 (4,881-59,428)	11,456 (5,644-16,019)	10,061	0.199
2019	14,971 (5,675-52,033)	12,828 (9,338-24,504)	2,143	0.513
2020	16,901 (4,140-44,111)	13,071 (8,436-18,972)	3,830	0.751
2021	14,193 (5,079-44,243)	4,665 (3,477-11,979)	9,528	0.101

*Payments reported as US Dollars

Predictors	Univariate Model		Multivariate Model	
	Estimate	P-Value	Estimate	P-Value
H-index	104	**<0.001**	829	**<0.001**
Number of Published Documents*	128	**<0.001**		
Male	31,954	**0.05**	30,242	**0.005**
Years out of Training	765	**0.03**	76	0.76

*Number of published documents was not included in the multivariate model due to multicollinearity with H-index (VIF = 4.84)