Socioeconomic Deprivation and Preoperative Presentation in Elective Foot and Ankle Surgical Patients in the Southeastern U.S

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INTRODUCTION:

Patients presenting with musculoskeletal complaints have been shown to present with worse baseline depression, pain, and physical well-being, as assessed by patient-reported outcome measures (PROMs). However, gaps remain in understanding how social deprivation varies across practice settings, particularly as it relates to orthopaedic foot and ankle surgery.

METHODS:

A retrospective observational study was performed. Patients presenting to a tertiary academic institution for elective foot and ankle procedures were identified from July 2022 to July 2024 via CPT codes. The elective surgical procedures of interest were those most commonly performed by the senior author, including gastrocnemius recession, Brostrom-Gould reconstruction, bunionette correction, first MTP joint fusion, and atraumatic midfoot fusions, resulting in the identification of 517 surgical encounters. Patient demographics were collected via retrospective chart review. Baseline physical function was assessed through the prospective administration of PROMIS Global-10, Physical Function (PF), and the Foot Functional Index (FFI). Descriptive and inferential statistics were used to analyze the variables of interest.

RESULTS: Ultimately, a total of 372 patients met the inclusion criteria for analysis A total of 140 patients were represented in the first ADI tertile, 130 patients in the second tertile, and 102 in the third tertile. Median FFI Score was statistically significantly different (H = 17.318, p-value = 0.000174). Post-hoc comparisons indicated significant differences between the first and second tertiles (p-value=0.000614) and the first and third tertiles (p-value=0.000190). A Fisher Exact Test identified no significant associations between ADI tertile and duration of reported symptoms (p=0.463). Median patient-reported VAS scores for pain within the last 24 hours, pain with activity, and pain at rest were significantly greater among the second and third tertiles relative to the median reported scores in the first tertile.

DISCUSSION AND CONCLUSION:

Among a population in the southeastern United States, patients presenting for elective foot and ankle surgery from areas of greater social deprivation were observed to report increased pain and relatively lower physical function compared to those from areas of less deprivation. There were no significant differences identified in the duration of symptoms among the ADI tertiles.

Table 1. Patient Demographics (N=372)

Patient Demographics		First ADI Tertile (n=140)	Second ADI Tertile (n=130)	Third ADI Tertile (n=102)	p-value
Age at Time of Surgery (y)					**<0.001**
	Mean (SD)	52.30 (14.68)	44.79 (14.98)	58.29 (14.10)	
	Median (IQR)	54.00 (43-63)	45.00 (35-56)	52.00 (46-61)	
Sex, n (%)					0.0079
	Female	89 (70.6%)	99 (77.9%)	78 (83.9%)	
	Male	37 (29.4%)	27 (22.1%)	15 (16.1%)	
Race/Ethnicity n (%)					**<0.001**
	White	90 (71.4%)	79 (60.7%)	27 (29.0%)	
	Black	34 (27.0%)	42 (34.4%)	60 (67.7%)	
	Asian		1 (0.8%)	1 (1.1%)	
	Other Race	2 (1.6%)	3 (2.5%)	2 (2.2%)	
Primary Language, n (%)					0.25
	English	125 (99.3%)	120 (98.5%)	91 (98.9%)	
	Spanish		2 (1.6%)	2 (2.0%)	
	Other				
Marital Status, n (%)					**<0.001**
	Married	81 (64.3%)	69 (60.2%)	33 (35.5%)	
	Single (Divorced, single, widowed, separated)	42 (34.13%)	68 (56.30%)	47 (63.2%)	
	Other/Unknown	2 (1.6%)	1 (0.8%)	1 (1.1%)	
Insurance Type, n (%)					0.469
	Commercial	81 (58.5%)	63 (49.2%)	55 (55.0%)	
	Government Insurance	43 (30.9%)	54 (42.2%)	33 (33.0%)	
	Self-Pay	2 (1.4%)	3 (2.3%)	2 (2.0%)	

Table 2. Patient Past Medical History at Time of Presentation

Variable		First Quartile ADI (N=140)	Second Quartile (N=130)	Third Quartile (N=102)	p-value
Preoperative Body Mass Index (BMI)					**0.0101**
	Mean (SD)	33.34 (8.247)	36.79 (8.13)	35.62 (7.39)	
Past Medical History					
	Tobacco Use	35 (25.4%)	30 (39.1%)	34 (35.7%)	0.127
	Diabetes Mellitus	34 (24.6%)	33 (26.0%)	17 (16.0%)	0.0796
	Hypertension	67 (48.6%)	54 (42.5%)	45 (49.0%)	0.398
	Vascular Disease	38 (27.5%)	17 (13.3%)	18 (19.0%)	**0.0062**
	Neuropathy	13 (9.4%)	18 (14.1%)	6 (6.1%)	0.0561
	Osteoarthritis	**28 (19.8%)**	11 (8.7%)	19 (18.8%)	**0.0369**
	Rheumatoid Arthritis	7 (5.2%)	4 (3.2%)	4 (4.0%)	0.295
Duration of Presenting Symptoms					0.463
	< 1 Month	6 (2.9%)	4 (3.1%)	4 (4.0%)	
	2-6 Months	24 (17.4%)	16 (12.6%)	24 (24.0%)	
	6 Months-1 Year	25 (18.1%)	21 (16.5%)	22 (22.0%)	
	1-5 Years	31 (22.5%)	35 (27.6%)	19 (19.0%)	
	>5 Years	54 (26.0%)	37 (29.1%)	28 (28.0%)	
	Not Provided	20 (14.5%)	14 (11.0%)	11 (11.0%)	
History of Previous Foot and Ankle Procedures					0.177
	Yes	45 (32.0%)	33 (25.8%)	26 (26.0%)	
	No	92 (67.2%)	94 (75.4%)	71 (71.0%)	
	Not Provided	2 (1.4%)	2 (1.6%)	3 (3.0%)	
Surgical Procedures		n=181	n=173	n=129	
	Bronstrom-Gould	29 (16.0%)	26 (15.0%)	15 (11.6%)	
	First MTP Fusion	26 (11.4%)	23 (13.3%)	17 (13.2%)	
	Gastrocnemius Recession	71 (39.2%)	54 (31.2%)	64 (49.6%)	
	Midfoot Fusion	36 (19.9%)	55 (31.8%)	26 (20.2%)	
	Bunionette Correction	23 (12.8%)	15 (8.7%)	7 (5.4%)	

Table 3. PROMIS Physical Health and Physical Function at Time of Presentation

PROMIS Items		First Tertile	Second Tertile	Third Tertile	p-value
Global Physical Health					**<0.001**
	Mean	43.57 ± 7.33	40.93 ± 8.22	38.52 ± 5.99	
	Median (IQR)	42.30 (38.60- 47.70)	39.880 (34.90 - 44.90)	37.40 (34.90 - 42.30)	
PROMIS Physical Function					0.133
	Mean	39.39 (6.70)	38.70 (7.66)	37.1 (4.8, 39)	
	Median (IQR)	39.61 (36.40 - 42.55)	37.92 (34.65 - 43.38)	36.41 (32.69- 40.82)	

Table 4. Foot Functional Index (FFI) at Time of Presentation

Foot Functional Index (FFI)		First Tertile	Second Tertile	Third Tertile	p-value
Pain					**< 0.001**
	Mean	61.406± 20.83	73.34 ± 22.37	77.45± 15.61	
	Median (IQR)	66.00 (45.50 - 78.00)	82.00 (60.00 - 94.00)	80.00 (72.00 - 86.00)	
Disability					**< 0.001**
	Mean	58.58 ± 24.45	70.28 ± 24.32	75.72 ± 18.94	
	Median (IQR)	62.22 (40.00 - 77.78)	73.33 (61.11 - 88.89)	76.67 (69.43 - 85.56)	
Activity Limitation					**0.0454**
	Mean	36.31 ± 29.88	44.56 ± 30.36	43.60 ± 29.94	
	Median (IQR)	26.67 (15.84 - 60.00)	33.33 (23.33 - 65.00)	33.33 (20.00 - 66.67)	
Overall FFI Score					**< 0.001**
	Mean	52.27 ± 16.7	110.76 ± 27.13	113.99 ± 29.93	
	Median (IQR)	52.00 (40.79 - 117.16)	113.39 (90.72 - 138.15)	115.42 (98.49 - 136.52)	

Table 5. Visual Analog Score (VAS) at the Time of Presentation

Visual Analog Score (VAS)		First Tertile	Second Tertile	Third Tertile	p-value
Pain in the Last 24 Hours					**< 0.001**
	Mean	53.52 ± 24.62	64.90 ± 25.52	67.20 ± 25.55	
	Median (IQR)	60.00 (30.00 - 78.00)	72.50 (46.75 - 90.00)	70.50 (50.75 - 82.50)	
Pain at Rest					**< 0.001**
	Mean	34.64 ± 24.36	50.34 ± 29.88	51.06 ± 30.98	
	Median (IQR)	30.00 (11.00 - 51.00)	51.00 (25.00 - 76.00)	54.50 (25.00 - 76.50)	
Pain When Active					**< 0.001**
	Mean	66.10 ± 24.20	75.63 ± 26.54	75.54 ± 26.76	
	Median (IQR)	70.00 (50 - 85)	83.00 (62.75 - 100.00)	80.00 (75.75 - 91.00)	