Preoperative Pain Catastrophizing, Depression, and Anxiety in Total Hip Arthroplasty Patients with Differing Radiographic Severity

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INTRODUCTION: Comorbid mood disorders and pain catastrophizing behavior in patients with hip osteoarthritis have been associated with worse pain scores and more functional limitations before and after undergoing a total hip arthroplasty (THA). There remain questions regarding the relationship between severity of hip disease and mental health factors on preoperative measures in patients with differing radiographic disease. The purpose of this study was to assess preoperative pain catastrophizing, depression, and anxiety scores in THA patients with less severe radiographic hip arthritis compared to those with more severe radiographic disease.

METHODS: A total of 785 patients were enrolled in a prospective cohort of THA patients at a tertiary hip program over a 5-year period. Study participation consisted of preoperative and postoperative survey completion with a minimum of 1-year postoperative follow up. The Pain Catastrophizing Scale (PCS) was used to assess for pain catastrophizing. The Hospital Anxiety and Depression Scale (HADS-A, HADS-D) was used to assess for anxiety and depression. Radiographic severity was assessed using preoperative radiographs and was graded with the Tönnis classification of osteoarthritis and joint space width.

RESULTS: Preoperative and postoperative surveys were completed for 411 patients. Preoperatively, 58 patients (14.11%) had a clinically relevant PCS score, 53 patients (12.90%) had an abnormal HADS-D score, and 53 patients (12.90%) had an abnormal HADS-A score. Tönnis Grade 0/1 patients had more abnormal preoperative HADS-A scores than Tönnis Grade 2/3 patients (20.51% vs. 11.11%, p = 0.038). There were no statistically significant differences in the preoperative PCS (p = 0.104) and HADS-D (p = 0.188) scores between Tönnis Grade 0/1 patients and Tönnis Grade 2/3 patients.

DISCUSSION AND CONCLUSION:

There are many factors that contribute to an orthopaedic patient's decision to undergo a THA, including their perspective on the severity of their disease and other psychological factors. In our study, patients with higher levels of anxiety were found to have less severe radiographic hip disease. This suggests that patients with clinically relevant anxiety were more likely to undergo a THA earlier in the course of their hip pathology rather than continuing with conservative management until they progress to end-stage disease.

Our study demonstrates that patients with greater anxiety scores had less severe radiographic disease. There was no difference in pain catastrophizing and depression scores between groups of less and more severe hip disease.

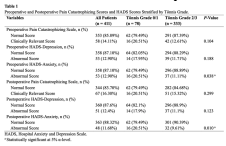

Table 1
Preoperative and Postoperative Pain Catastrophizing Scores and HADS Scores Stratified by Tönnis Grade.

Variables	All Patients (n = 411)	Tönnis Grade 0/1 (n = 78)	Tönnis Grade 2/3 (n = 333)	P-Value
Preoperative Pain Catastrophizing Scale, n (%)				
Normal Score	353 (85.89%)	61 (78.69%)	291 (87.39%)	
Clinically Relevant Score	58 (14.11%)	16 (20.51%)	42 (12.61%)	0.164
Preoperative HADS-Depression, n (%)				
Normal Score	358 (87.10%)	64 (82.05%)	294 (88.29%)	
Abnormal Score	53 (12.90%)	14 (17.95%)	39 (11.71%)	0.188
Preoperative HADS-Anxiety, n (%)				
Normal Score	358 (87.10%)	62 (79.49%)	296 (88.89%)	
Abnormal Score	53 (12.90%)	16 (20.51%)	37 (11.11%)	0.038*
Postoperative Pain Catastrophizing Scale, n (%)				
Normal Score	344 (85.78%)	62 (79.49%)	282 (84.68%)	
Clinically Relevant Score	57 (14.34%)	16 (20.51%)	51 (15.32%)	0.299
Postoperative HADS-Depression, n (%)				
Normal Score	368 (87.8%)	64 (82.1%)	296 (88.9%)	
Abnormal Score	51 (12.4%)	14 (17.9%)	37 (11.1%)	0.123
Postoperative HADS-Anxiety, n (%)				
Normal Score	363 (88.32%)	62 (79.49%)	301 (90.39%)	
Abnormal Score	48 (11.68%)	16 (20.51%)	32 (9.61%)	0.010*

HADS, Hospital Anxiety and Depression Scale.
*Statistically significant at 5% α-level.

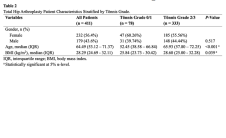

Table 2
Total Hip Arthroplasty Patient Characteristics Stratified by Tönnis Grade.

Variables	All Patients (n = 411)	Tönnis Grade 0/1 (n = 78)	Tönnis Grade 2/3 (n = 333)	P-Value
Gender, n (%)				
Female	232 (56.4%)	47 (60.26%)	185 (55.56%)	
Male	179 (43.6%)	31 (39.74%)	148 (44.44%)	0.517
Age, median (IQR)	64.49 (53.2 – 71.57)	52.43 (38.54 – 66.84)	65.93 (57.86 – 72.25)	<0.001*
BMI (kg/m²), median (IQR)	28.29 (24.69 – 32.11)	29.68 (25.71 – 34.62)	28.68 (25.00 – 32.20)	0.059*

IQR, interquartile range; BMI, body mass index.
*Statistically significant at 5% α-level.

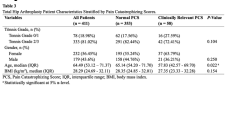

Table 3
Total Hip Arthroplasty Patient Characteristics Stratified by Pain Catastrophizing Scores.

Variables	All Patients (n = 411)	Normal PCS (n = 353)	Clinically Relevant PCS (n = 58)	P-Value
Tönnis Grade, n (%)				
Tönnis Grade 0/1	78 (18.98%)	62 (17.56%)	16 (27.59%)	
Tönnis Grade 2/3	333 (81.02%)	291 (82.44%)	42 (72.41%)	0.104
Gender, n (%)				
Female	232 (56.45%)	199 (56.38%)	33 (56.9%)	
Male	179 (43.55%)	154 (43.62%)	25 (43.1%)	0.528
Age, median (IQR)	64.49 (53.2 – 71.57)	65.34 (54.29 – 71.78)	57.83 (52.57 – 69.78)	0.022*
BMI (kg/m²), median (IQR)	28.29 (24.69 – 32.11)	28.29 (24.85 – 32.01)	27.53 (23.31 – 32.28)	0.134

PCS, Pain Catastrophizing Score; IQR, interquartile range; BMI, body mass index.
*Statistically significant at 5% α-level.

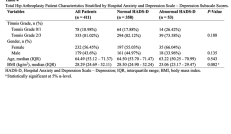

Table 4
Total Hip Arthroplasty Patient Characteristics Stratified by Hospital Anxiety and Depression Scale – Depression Subscale Scores.

Variables	All Patients (n = 411)	Normal HADS-D (n = 358)	Abnormal HADS-D (n = 53)	P-Value
Tönnis Grade, n (%)				
Tönnis Grade 0/1	78 (18.98%)	64 (17.88%)	14 (26.42%)	
Tönnis Grade 2/3	333 (81.02%)	294 (82.12%)	39 (73.58%)	0.188
Gender, n (%)				
Female	232 (56.45%)	197 (55.03%)	35 (66.04%)	
Male	179 (43.55%)	161 (44.97%)	18 (33.96%)	0.135
Age, median (IQR)	64.49 (53.2 – 71.57)	64.93 (53.78 – 71.47)	63.22 (50.25 – 79.99)	0.543
BMI (kg/m²), median (IQR)	28.29 (24.69 – 32.11)	28.29 (24.98 – 32.24)	27.98 (23.17 – 29.47)	0.082*

HADS-D, Hospital Anxiety and Depression Scale – Depression; IQR, interquartile range; BMI, body mass index.
*Statistically significant at 5% α-level.

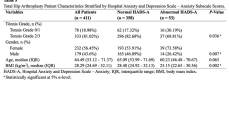

Table 5
Total Hip Arthroplasty Patient Characteristics Stratified by Hospital Anxiety and Depression Scale – Anxiety Subscale Scores.

Variables	All Patients (n = 411)	Normal HADS-A (n = 358)	Abnormal HADS-A (n = 53)	P-Value
Tönnis Grade, n (%)				
Tönnis Grade 0/1	78 (18.98%)	62 (17.32%)	16 (30.19%)	
Tönnis Grade 2/3	333 (81.02%)	296 (82.68%)	37 (69.81%)	0.038*
Gender, n (%)				
Female	232 (56.45%)	195 (53.91%)	39 (73.58%)	
Male	179 (43.55%)	163 (46.09%)	16 (30.42%)	0.007*
Age, median (IQR)	64.49 (53.2 – 71.57)	65.09 (53.95 – 71.69)	60.35 (48.48 – 70.67)	0.065
BMI (kg/m²), median (IQR)	28.29 (24.69 – 32.11)	28.48 (24.93 – 32.13)	25.19 (22.85 – 30.56)	0.002*

HADS-A, Hospital Anxiety and Depression Scale – Anxiety; IQR, interquartile range; BMI, body mass index.
*Statistically significant at 5% α-level.