Impacts of Depression, Anxiety, Stress, and Catastrophizing on Patient Activity Level Following Total Hip Arthroplasty

Seth Reine[1], Yin Xi[2], Joel E Wells[3]

[1]Orthopedic Surgery, University of Texas Southwestern Medical Center, [2]UT Southwestern Medical Center, [3]UT Southwestern Dept of Orthopaedic Surgery

INTRODUCTION: Psychological factors have a strong association of improvement with increased physical activity in the general population. The effects of depressive symptoms, anxiety, and pain catastrophizing on activity level have not been thoroughly explored in patients undergoing total hip arthroplasty (THA), which is often performed in response to pain, functional limitations, and activity limitations. Patient mental health plays a significant role in their perspective of treatment success and quality of life. As depression, anxiety, and pain catastrophizing have pharmacological and nonpharmacological treatment modalities unrelated to THA, there may be an opportunity to augment THA patient activity level and quality of life at various operative time points. We hypothesize that improvement in screenings for depression, anxiety, and catastrophizing will correlate with improvement in activity levels between preoperative and postoperative times.

METHODS: Two hundred ninety-two patients (313 hips) who underwent THA with a minimum one-year (mean 615±270 days) follow-up completed preoperative and postoperative surveys containing University of California Los Angeles Activity Score (UCLA), Hospital Anxiety Depression Scale (HADS), Pain Catastrophizing Scale (PCS), and Depression Anxiety Stress Scale-21 (DASS). Dependent Student's t-tests were performed between preoperative and postoperative times for each outcome measure and their subscales. Partial Spearman rank-order correlations were performed between UCLA Activity Score and HADS, PCS, and DASS subscales controlling for age, BMI, and follow-up time with false discovery rate correction of p-values.

RESULTS: Paired dependent samples t-tests found statistically significant improvements not only in UCLA Activity Score (p-value < 0.0001) but also in every subscale of PCS (rumination, magnification, helplessness), HADS (anxiety and depression), and DASS (depression, anxiety, stress) (p-values < 0.0001). Significant negative correlations of mild strength existed between change in UCLA Activity Score and change in PCS rumination (r=-0.253, p-value<0.0001), change in HADS anxiety (r=-0.265, p-value<0.0001), and change in HADS depression (r=-0.282, p-value<0.0001) following THA. Significant negative correlations of weak strength existed between change in UCLA Activity Score and change in the remaining PCS and DASS subscales (p-values<0.01) following THA.

DISCUSSION AND CONCLUSION: Improvements in patient-reported depression, anxiety, and pain catastrophizing screenings following THA were associated with increases in activity level. Patients with symptoms of catastrophizing, depression, and anxiety achieved both statistically and clinically meaningful improvements in symptom profiles following THA. With the relationship between activity level and psychological factors, addressing patient mental health may provide another avenue in the holistic care of THA patients to better meet treatment goals.

Table 1. Postoperative Change in Activity, Catastrophizing, Depression, Anxiety, and Stress Screening in THA Patients with Dependent Student's t-test

Outcome Measure	Preop Mean (SD)	Postop Mean (SD)	Delta Mean (SD)	p-value
UCLA	4.83 (2.06)	5.75 (2.06)	0.91 (2.05)	6.15e-14
PCS Rumination	5.02 (4.84)	1.48 (2.93)	-3.54 (5.13)	3.55e-28
PCS Magnification	2.59 (2.84)	0.96 (1.91)	-1.63 (3.00)	2.38e-19
PCS Helplessness	4.69 (5.13)	1.68 (3.37)	-3.01 (4.97)	5.66e-23
PCS Total	12.31 (12.03)	4.13 (7.79)	-8.18 (12.25)	7.71e-27
HADS Anxiety	4.60 (4.24)	2.64 (3.09)	-1.96 (4.01)	2.95e-16
HADS Depression	4.96 (4.03)	2.48 (2.78)	-2.48 (3.89)	6.66e-25
DASS Anxiety	3.36 (4.75)	2.32 (3.54)	-1.47 (3.99)	4.89e-7
DASS Depression	4.57 (6.62)	2.50 (4.35)	-2.07 (5.38)	1.81e-7
DASS Stress	6.31 (7.18)	3.78 (5.36)	-2.69 (6.52)	3.01e-8

Table 2. Partial Spearman's rank-order correlations with change in UCLA Activity Score in THA patients

(FDR: False Discovery Rate p-value)

Outcome Measure	r-spearman	FDR
PCS Rumination	-0.253	1.80e-5
PCS Magnification	-0.194	8.80e-4
PCS Helplessness	-0.211	3.36e-4
PCS Total	-0.236	6.07e-5
HADS Anxiety	-0.265	9.00e-6
HADS Depression	-0.282	3.85e-6
DASS Anxiety	-0.178	1.40e-2
DASS Depression	-0.204	5.63e-3
DASS Stress	-0.164	2.26e-2