Sleep Disturbances Following Total Knee Arthroplasty

Kimberly Ann Bartosiak, Jacqueline Shay King[1], Venessa Riegler, Andre Kenyan Guthrie[2], Charles M Lawrie, Brendan P Lucey[3], Robert L Barrack[4]
[1]Orthopedic Surgery, Washington University School of Medicine, [2]Washington University St. Louis, [3]Neurology, [4]Washington University

INTRODUCTION: Sleep disturbances negatively impact outcomes in patients who undergo total knee arthroplasty (TKA). The purpose of this study was to employ objective as well as subjective patient sleep data to determine if sleep disturbances following TKA correlate with pain level, use of opioid pain medications, or activity level.

METHODS: A retrospective analysis of objective and subjective sleep data was performed using a wearable device previously validated for sleep monitoring (Fitbit) (N=62) as well as the Pittsburgh Sleep Quality Index (PSQI) (N=78). Mean total sleep time (TST) from Fitbit and PSQI scores for each patient were generated preoperatively and for each month postoperatively until 120 days. Daily remote monitoring was used to quantify daily pain (VAS 1-10), opioid consumption (morphine equivalents), and activity level (step count) from which monthly means were calculated. Sleep disturbance was defined as a >10% decrease in post-operative TST or decline in PSQI score. A student's t-test was used to compare the sleep disturbance group and non-sleep disturbance group to determine if pain, opioid use or step count was different between those with sleep disturbance and those without.

RESULTS: In the first postoperative month following TKA mean TST decreased by more than 10% in 32 of 62 (52%) while PSQI score worsened 55 of 78 patients (71%). Of those with sleep disturbance, at 4 months postoperatively 17 of 32 (53%) had not recovered their TST while only 5 of 55 (9%) had PSQI scores that had not returned to baseline. Mean VAS pain score, opioid pills taken and step count did not demonstrate statistically significant difference between patients with objective or subjective sleep disturbance and those without sleep disturbance at any time point postoperatively.

DISCUSSION AND CONCLUSION:

Sleep disturbance is common following TKA. Objective and subjective measures of sleep disturbance are independent from pain or activity level in this study.