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Research Article

MENTAL HEALTH HISTORY AND PREOPERATIVE PSYCHOTROPIC USE IS AN INDEPENDENT PREDICTOR OF LENGTH OF STAY POST ELECTIVE HIP AND KNEE ARTHROPLASTY

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ABSTRACT

Objectives: An increasing number of patients are undergoing knee and hip arthroplasty. Similarly, Psychiatric disease has been found to be more prevalent in the patients undergoing arthroplasty than the general population. An increased appreciation of the impact of mental health status on outcomes post arthroplasty could identify an important area to target interventions. The purpose of this study is to assess whether patients with a mental health diagnosis or those using psychotropic medication have an increased length of stay post arthroplasty.

Methods: One hundred random medical records were requested from a pre-admission clinic at a private hospital in Perth, Western Australia. All of these procedures were elective in nature. Revision for infection and fractures were excluded. Patients with a mental health history or use of psychotropic medication were identified based on preadmission notes.

Results: In total, 17 patients with a mental health history or using psychotropic medication were identified. This group of patients had a statistically significant increased length of hospital stay with an average of 2.63 days (p=0.001) longer. Our study also identified female patients were more likely to be in this group, which is in keeping with the Australian population.

Conclusions: A presence of a known mental health diagnosis or use of psychotropic medication appears to increase the likelihood of a lengthened hospital stay post elective hip and knee arthroplasty. Therefore, identifying these patients prior to surgery and offering additional support may benefit both the patient and the healthcare system. Further, studies, which examine the nature of this relationship including potential causal links, and explore the utility of pre or post operative interventions in influencing recovery time, will be useful.

INTRODUCTION

Background

The number of patients undergoing arthroplasty has grown dramatically (Riddle 2010). The Australian Orthopaedic Association National Joint Replacement Registry (AOANJRR) analysed the results of 1,091,237 primary and revision hip and knee replacements for the hip and knee arthroplasty 2016 annual report[2]. This is a 2.6% and 5.9% increase in hip and knee procedures compared to the 2015 Annual Report[2]. Arthroplasty is now the accepted optimal management for patients with severe hip and knee arthritis (Lingard 2004, Browne 2014).

(Bourne 2010). found that 11% to 19% of primary total knee replacement patients are not satisfied with their surgical intervention although primary total knee arthroplasty has revolutionized the care of patients with end-stage arthritis. Depression has been found in high frequency in patients with chronic musculoskeletal pain (Magni 1994). This is reflected by the fact that Psychiatric disease has been found to be more prevalent in the patient group undergoing arthroplasty than the general population[6]. The prevalence of depression continues to increase worldwide and the World Health Organisation (WHO) has predicted that by 2030, depression will account for the highest level of disability accorded any physical or mental disorder in the world. Riddle *et al.* and Ellis *et al.* studied depression in preoperative total knee arthroplasty patients and found a 22.5% and 26% prevalence of depression respectively

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[1,8]. Similarly, about 20% of patients undergoing hip replacement surgery for end-stage osteoarthritis have been found to have a mood disorder[9]. Depression has also been demonstrated to be associated with increased pain and analgesia use after arthroplasty (Singh 2012, Rakel 2012). Depression has been linked to worse subjective and objective measures of post-operative outcomes[3,] (Manicavasagar 2012). Preoperative anxiety and depression were found to be one of the strongest negative predictors of pain relief and patient satisfaction (Brander 2007).

This study investigates whether the presence of a known mental health diagnosis or being on a psychotropic medication preoperatively has an association with the length of hospital stay. These factors can be easily identified even in a busy surgical preadmission clinic and there is the potential for additional resources including more focussed allied health input to be directed towards this patient population.

METHODS

One hundred patient records were requested randomly from the Orthopaedic pre-admission clinics at Hollywood Private Hospital. A random number generator was used to randomly select 100 patients from between January 2011 and January 2013. Of those 100 patients, 94 were primary hip or knee joint replacements. All of these patients had private health insurance and the surgeries were elective in nature. Revision for infection and fractures were excluded. Patients with mental health conditions or use of psychotropic medication were identified based on the preadmission notes. Length of stay was compared between the two groups.

RESULTS

A total of 94 patients met the inclusion criteria for the study and of these 17 had either a mental health history or were on psychotropic medication (referred to here as 'history'). The statistical analyses reported here were performed using SPSS Software with an alpha of .05. Categorical data (gender and procedure) were analysed using chi-square tests to determine whether there were any differences between those with and without a history. Independent samples t-tests were conducted to analyse age and length of stay data, with effect sizes for *t*-tests estimated using Cohen's *d* (small = .20, medium = .50, large = .80)

Table 1 presents the descriptive statistics. Two chi-square tests were conducted between history and gender, and between history and procedure, to determine baseline differences. For both tests all expected cell frequencies were greater than five.

Table 1 Descriptive statistics for patients with and without a mental health history/psychotropic medication history (History). Counts are presented for gender and procedure, where procedures included Total Knee Replacement (TKR) and Total Hip Replacement (THR). Means (M) and standard deviations (SD) are presented for age and length of stay in days (LoS).

History	Gender	Procedure	Age	LoS
No	M = 45	TKR = 44	*M* = 71.2	*M* = 6.43
(*N* = 77)	F = 32	THR = 33	*SD* = 9.1	*SD* = 2.47
Yes	M = 3	TKR = 11	*M* = 71.1	*M* = 9.06
(*N* = 17)	F = 14	THR = 6	*SD* = 10.1	*SD* = 4.22

There was a significant association between gender and history, $\chi^2(1) = 9.27$, $p = .002$, where females were more likely to have a history. There was no association between procedure and history, $\chi^2(1) = .33$, $p = .57$, and no effect of age on history, $F < 1$, $p = .99$.

The independent samples *t*-test determined that there was a large, significant effect of history on length of stay, $t(92) = 3.44$, $p = .001$, $d = .92$, where patients with a history stayed in hospital longer.

Of the 17 patients with mental health conditions or psychotropic medication use, the following diagnoses were identified: Depression, Anxiety, Panic Attacks, Dysthymia, Chronic Benzodiazepine Abuse, PTSD and Panic Disorder. The following medications were used: Escitalopram, Amitriptyline, Paroxetine, Venlafaxine, Sertraline, Mirtazapine and Alprazolam. None of the patients had a diagnosis of a psychotic disorder or Bipolar Affective Disorder or were prescribed antipsychotic medications or mood stabilizers.

DISCUSSION

The study findings suggest that patients with mental health conditions require a longer post-surgical stay following knee and hip arthroplasty. This presents significant costs both to the patient and to the hospital or healthcare system. Identifying this patient population pre-operatively, could allow for the direction of extra supports post-operatively via physiotherapy, occupational therapists and councillors to facilitate a more speedy recovery. This extra cost to the hospital may be offset by a shorter hospital stay. Additionally, there may also be a role for educating patients and optimising mental health status and treatment pre-operatively.

This study also identified that females appear more likely to have a mental health history or be on psychotropic medication. This is consistent with the general Australian population, where women are known to be disproportionately affected (Kulkarni 2012).

Limitations for this study include the limited spread of mental health diagnosis, for example none of the patients in the study had Bipolar Affective Disorder or any psychotic illness. These conditions may impact on post surgical recovery more greatly. However, it does also reflect the spread of mental health diagnoses in the general population, where these disorders are much less prevalent than the ones studied in this paper. It is also important to note that all patients had private health insurance, which likely reflects a sample skewed to a higher socioeconomic demographic. Patients who may not be able to afford private health cover due to the greater effect of their mental illness may be more greatly affected post surgically as well.

Other limitations include the retrospective nature of this study and the use of pre-admission notes, which may not completely capture all Psychiatric histories. Additionally, a preoperative diagnosis and use of psychotropic medication are fairly crude measures for establishing the presence of a mental health disorder, and antidepressant medications may be prescribed for a host of reasons other than anxiety or mood disorders, such as neuropathic pain, insomnia and functional gut disorders. However, our goal was not to diagnose a mental health disorder

preoperatively, but to identify potential measures that could be used in a busy surgical preadmission clinic to identify a cohort of patients that may benefit from extra support.

Other studies also support the idea that recovery following arthroplasty is affected by mental health conditions. In their study McHugh *et al*. found that anxiety and depression were predictors that affected recovery six months after total hip replacement. Similarly, Riediger *et al*. showed worse outcomes following total hip replacement for patients with preoperative depression and somatisation.

CONCLUSION

A known mental health diagnosis and/or being on psychotropic medication preoperatively is associated with an increased length of hospital stay post knee and hip arthroplasty. This supports the existing evidence that mental health status can impact on recovery post athroplasty. Psychiatric input or diversion of additional recovery-oriented resources for this patient group may be warranted to optimise their outcomes and decrease their length of stays. This could both positively impact patient experiences and act as a cost saving mechanism for the healthcare system. However, further studies that explore the nature of this relationship including the potential causal links between mental health status and recovery post athroplasy are required. Also, studies on potential pre or post operative interventions that can influence this recovery time would be useful.

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