Manipulation Under Anesthesia is independently associated with development of Prosthetic Joint Infection within 1 year of Total Knee Arthroplasty

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INTRODUCTION:

Prosthetic joint infection (PJI) is one of the devastating complications after total knee arthroplasty (TKA). Manipulation under anesthesia (MUA) is a treatment used to address post operative stiffness following TKA. Association between MUA and development of PJI is controversial. Risk factors for development of PJI in this cohort are unknown. METHODS:

We have utilized a national claims database (PearlDiver®) to isolate TKA and MUA within 4 months of TKA cases using the Current Procedural Terminology (CPT) codes from 2010-2022. PJI cases within 1 year of TKA and previously validated risk factors were identified using International Classification of Disease, 9th and 10th Revision (ICD-9&10) codes. Chi-square and logistic regression were used for univariable and multivariable analyses respectively. RESULTS:

A total of 1,660,909 TKA cases were isolated. MUA within 16 weeks of TKA was performed in 57,721 cases. PJI within 1 year of TKA was diagnosed in 3,527 cases. Rate of PJI among patients undergoing MUA (0.28%; n=159) was statistically significantly (p<0.001) higher than rate of PJI among patients not undergoing MUA (0.21%; n=3368). Multivariable analysis showed MUA within 16 weeks to be independently associated with PJI within 1 year of TKA (OR=1.4; 95% CI:1.19-1.63; p<0.001). Male gender (OR=2.32; 95%CI:1.69-3.21; p<0.001), pre-existing comorbidities of deficiency anemia (OR=2.12; 95%CI:1.1-3.74; p=0.015), and chronic obstructive pulmonary disease (OR=1.73; 95%CI:1.09-2.64; p=0.02) and post TKA development of UTI (OR=6.65; 95%CI:2.02-16.13; p<0.001) were identified as independent risk factors for development of PJI in this cohort. The receiver operating characteristic curve- area under the curve (ROC-AUC) for the model was 0.7.

DISCUSSION AND CONCLUSION:

The current study showed that MUA within 16 weeks of TKA is independently associated with development of PJI within 1 year, on multivariable analysis. Our model for independent risk factors for PJI in this cohort shows good to moderate predictability.

| Table 6 | | | | |
|--|-----------------------|---------------|------------------------|---------|
| Logistic Regression between Manipulation L | Jnder Anesthesia w | ithin 4 mont | hs of | |
| Total Knee Arthroplasty Developing Prosthe | tic Joint Infection w | /ithin 1 year | | |
| and Comorbidities and Complications | | | | |
| Logistic Regression | | Odds Ratio | 95% CI | p-value |
| Manipulation under anesthesia with PJI | Dependent Variable | | | |
| | Yes | | | |
| | No | | Reference Category | |
| Gender | | | | |
| | Male | 2.32 | 1.69-3.21 | <0.001 |
| | Female | | Reference Category | |
| Rheumatoid Arthritis (RA) | | | | |
| | Yes | 2.66 | 1.19-5.14 | 0.008 |
| | No | | Reference Category | |
| Deficency Anemia | | | | |
| | Yes | 2.12 | 1.1-3.74 | 0.015 |
| | No | | Reference Category | |
| Chronic Obstructive Pulmonary Disease (COPD) | | | | |
| | Yes | 1.73 | 1 09-2 64 | 0.02 |
| | No | | Reference Category | |
| Lines, Treat lefestion (LTI) | | | i loidi ciide Gulogory | |
| Urinary Tract Infection (UTI) | N a a | 0.05 | 0.00.40.40 | 10.004 |
| | Yes | 6.65 | 2.02-16.13 | <0.001 |
| | No | | Reference Category | |