Dexamethasone Utilization is Associated with Lower Rates of Pulmonary Complications During Cemented Total Hip Arthroplasty

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INTRODUCTION: The utilization of cemented femoral fixation during total hip arthroplasty (THA) has increased in recent years as concerns regarding the risk of periprosthetic femur fractures have materialized. Dexamethasone is associated with a decreased risk of thromboembolic complications following total joint arthroplasty. Furthermore, perioperative corticosteroids have been shown to decrease anaphylatoxins associated with cemented femoral fixation. This study sought to compare rates of postoperative pulmonary complications in patients undergoing cemented THA amongst patients who received dexamethasone compared to those who did not receive dexamethasone.

METHODS: Patients who underwent cemented THA for hip fractures or elective indications from January 1, 2015 to December 31, 2021 were identified using the Premier Healthcare Database (PHD). Two cohorts were identified: patients who received intravenous dexamethasone [DEXA(+)] or not [DEXA(-)] on the day of index THA. The 90-day risk of pulmonary complications was compared between the DEXA(+) and DEXA(-) cohorts. Multivariable analysis accounted for demographic, comorbidity, and chemoprophylactic confounding variables.

RESULTS: In total, 27,017 cemented THAs were identified [DEXA(+): 14,743 (54.6%), DEXA(-): 12,274 (45.4%)]. Compared to DEXA(-) patients, those in the DEXA(+) cohort were less likely to be re-intubated (0.58% vs 1.05%, p<0.001) or diagnosed with pneumonia (2.11% vs 4.18%, p<0.001), acute respiratory failure (3.6% vs 5.7%, p<0.001), or pulmonary edema (0.57% vs 1.12, p<0.001). After accounting for potential confounders, DEXA(+) patients were at decreased risk of pneumonia (adjusted odds ratio [aOR]: 0.73, 95%-CI: 0.63-0.85, p<0.001) and pulmonary edema (aOR: 0.72, 95%-CI: 0.54-0.96, p=0.026) compared to DEXA(-) patients. DEXA(+) patients were at decreased risk of sepsis (aOR: 0.75, 95%-CI: 0.62-0.89, p=0.001), UTI (aOR: 0.75, 95%-CI: 0.68-0.84, p<0.001), and postoperative hemorrhage (aOR: 0.61, 95%-CI: 0.39-0.93, p=0.023).

DISCUSSION: Dexamethasone was associated with a decreased risk of pulmonary complications, including pneumonia and pulmonary edema following cemented total hip arthroplasty. Our findings support the utilization of perioperative dexamethasone for cemented total hip arthroplasty to decrease the risk of pulmonary complications associated with poly-methyl-methacrylate use. This data adds to the previously established benefits of perioperative dexamethasone administration in patients undergoing total joint arthroplasty, including decreased postoperative pain and nausea, decreased postoperative opiate consumption, and shorter length of stay. Our study has several limitations, including the retrospective study design.

SIGNIFICANCE/CLINICAL RELEVANCE: Dexamethasone utilization should be considered for patients undergoing cemented THA due to the potential to decrease pulmonary complications and improve patient outcomes.

IMAGES AND TABLES:

Table 1. Respiratory Complications of DEXA(+) and DEXA(-) Patients

	DEXA (+) N = 14,743		**DEXA (-) N = 12,274**		**Univariate Regression**			**Multivariate Regression**		
Complication	**N**	**%**	**N**	**%**	**OR**	**P-Value**	**95%-CI**	**aOR**	**P-Value**	**95%-CI**
Intubation	85	0.58%	129	1.05%	0.55	**<0.001**	0.41 - 0.72	0.93	0.656	0.69 - 1.26
Pneumonia	311	2.11%	513	4.18%	0.49	**<0.001**	0.43 - 0.57	0.73	**<0.001**	0.63 - 0.85
Acute Respiratory Failure	536	3.64%	705	5.74%	0.62	**<0.001**	0.55 - 0.69	0.90	0.106	0.79 - 1.02
Pulmonary Edema	84	0.57%	137	1.12%	0.51	**<0.001**	0.39 - 0.67	0.72	**0.026**	0.54 - 0.96

OR: Odds ratio. aOR: Adjusted odds ratio. CI: Confidence interval