Oral Dexamethasone following Total Knee Arthroplasty: A Prospective, Double-Blind, Randomized, Placebo-Controlled Trial

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INTRODUCTION:
As ambulatory total knee arthroplasty becomes more common; it is prudent to investigate safe and effective postoperative oral medications to optimize patients' recovery. This double-blind, randomized, placebo-controlled trial investigates the postoperative effects and safety of oral dexamethasone.
METHODS:
The authors prospectively, randomized 109 consecutive patients undergoing primary total knee arthroplasty at one institution. Patients were assigned to one of two groups: Group A (57 patients) received 4 mg of dexamethasone by mouth twice per day starting postoperative day (POD) one for four days and Group B received placebo capsules. All healthcare professionals and patients were blinded to group allocation. The primary outcome was defined as postoperative pain scores for POD 1-7. Secondary outcomes included 90-day postoperative complications, reported nausea and vomiting, amount of oxycodone per day, ability to ambulate with/without assistance, difficulty sleeping, and early patient reported outcomes.
RESULTS:
Demographics and comorbidities were similar between groups. The patients who received dexamethasone had statistically significant decrease in average VAS scores POD 1-4 ($p<0.05$) (Table 1). The average VAS score of POD 2, 3, and 4 were significantly lower with dexamethasone. Morning and midday VAS scores were significantly lower in Group A (Table 2). The dexamethasone group took less oxycodone than the placebo group, but this was not statistically significant ($p>0.05$). There was no difference between the groups with nausea or vomiting, 90-day complications, ability to walk with/without assistance, difficulty sleeping, and early patient reported outcomes.
DISCUSSION AND CONCLUSION:
This double-blind, randomize, placebo-controlled trial demonstrated that oral dexamethasone following a primary total knee arthroplasty is not only safe, but reduces pain postoperatively when added to a multimodal pain control regimen. This stands as a beneficial option in ambulatory surgery when patients are unable to receive the postoperative IV dose of dexamethasone.

Table 1: Covariate Analysis of Postoperative Pain

Covariate	Statistics	Level	Medication A N=57	Medication B N=52	Parametric P-value*
Average VAS Score Day 1	N		57	52	0.287
	Mean		4.45	4.83	
	Median		4.58	4.75	
Average VAS Score Day 2	N		57	52	**<.001**
	Mean		3.71	4.98	
	Median		3.67	5	
Average VAS Score Day 3	N		57	52	**0.040**
	Mean		3.55	4.24	
	Median		3.33	4	
Average VAS Score Day 4	N		57	51	**0.048**
	Mean		3.35	4.01	
	Median		3.17	3.67	
Average VAS Score Days 1-4	N		57	52	**0.010**
	Mean		3.77	4.52	
	Median		3.42	4.47	
Average VAS Score Days 1-7	N		57	52	0.118
	Mean		3.75	4.21	
	Median		3.43	4.25	

* The parametric p-value is calculated by ANOVA for numerical covariates and chi-square test for categorical covariates.

Table 2: Covariate Analysis of Postoperative Pain throughout the Day and Amount of Opioid Medications

Covariate	Statistics	Level	Medication A N=57	Medication B N=52	Parametric P-value*
Average Morning Days 1-4	N		57	52	**0.006**
	Mean		3.81	4.63	
	Median		3.8	4.38	
Average Midday Days 1-4	N		57	52	**0.005**
	Mean		3.64	4.45	
	Median		3.63	4.5	
Average Evening Days 1-4	N		57	52	0.052
	Mean		3.85	4.46	
	Median		3.5	4.5	
Number of Oxycodone Day 1	N		55	49	0.517
	Mean		3.27	3.63	
	Median		3	3	
Number of Oxycodone Day 2	N		56	48	0.055
	Mean		3.02	4.17	
	Median		3	3	
Number of Oxycodone Day 3	N		53	47	0.087
	Mean		2.3	3.26	
	Median		2	2	
Number of Oxycodone Day 4	N		55	46	0.198
	Mean		2.24	2.93	
	Median		2	1	

* The parametric p-value is calculated by ANOVA for numerical covariates and chi-square test for categorical covariates.