Dexamethasone Decreases Opioid Consumption Up To 3 Months After Rotator Cuff Repair

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INTRODUCTION: The purpose of this study was to evaluate the analgesic impact of perioperative administration of dexamethasone on post-operative pain and opioid consumption in patients who underwent arthroscopic rotator cuff repair (RCR). Our hypothesis is that perioperative administration of dexamethasone will lead to better pain control and reduced opioid consumption post-rotator cuff repair.

METHODS: A retrospective review was conducted of patients undergoing primary arthroscopic RCR with MRI or ultrasound confirmed supraspinatus or infraspinatus tears from 2013-2023. Exclusion criteria included the following: ≤18 years old, subscapularis or unclassified RCR, history of ipsilateral shoulder surgery, kidney or liver failure, history of alcohol/drug abuse, and <3 months of postoperative follow-up. The primary outcomes of interest were visual analog scale (VAS) pain scores, and the secondary outcome was opioid consumption as measured by morphine milligram equivalents (MME) up to 3 months postoperatively. Statistical analysis was performed to compare outcomes of patients who received 10 mg of perioperative dexamethasone (dexamethasone group) to those who did not (control group). Outcomes were stratified by tear size: partial, small/medium, and large/massive tears.

RESULTS: A total of 633 patients were included, with 311 patients in the dexamethasone group and 322 in the control group. Average age (61.2±8.5 vs. 63.0±9.6; P=0.005) and rate of diabetes mellitus (18.3% vs. 29.8%; P<0.001) were significantly lower in the dexamethasone group. There were no significant differences in VAS scores between groups for any tear size out to 3 months. In general, opioid consumption was significantly lower in the dexamethasone group at 1 week (523.3 ± 372.5, 584.1 ± 331.4, p<0.001) and 3 months (224.9 ± 843.7, 262.3 ± 659.8, p=0.006) post-operatively. When stratified by tear size, patients in the dexamethasone group experienced significantly lower opioid consumption at 1 week (491±532 vs. 535±285; P<0.001) for partial tears; at 1 week (523±372 vs. 584±331; P<0.001), 6 weeks (274±536 vs. 490±848; P<0.001), and 3 months (120±369 vs. 294±774; P<0.001) for small/medium tears; and at 1 week (521±360 vs. 623±318; P<0.001) and 3 months (174±838 vs. 270±608; P=0.021) for large/massive tears. Retear rates were equivalent between the dexamethasone and control groups, respectively (12, 3.9% vs. 5, 1.6%, p=0.438). There were no other significant differences in complications between groups for any tear size.

DISCUSSION AND CONCLUSION: Perioperative IV dexamethasone use in patients undergoing primary arthroscopic RCR is associated with decreased opioid consumption with equivalent pain control up to 3 months postoperatively.

Table 1: Demographics

Variable	Dexamethasone Group (N=311)	Control Group (N=322)	*P* Value
Age (years)	61.2 ± 8.5	63.0 ± 9.6	[a]**0.005**
Sex			0.074
Female	166 (53.4)	149 (46.3)	
Male	145 (46.6)	173 (53.7)	
Race			[a]**<0.001**
African American	136 (43.7)	67 (20.8)	
Caucasian	151 (48.6)	235 (73.0)	
Other	7 (2.3)	10 (3.1)	
Unspecified	17 (5.5)	10 (3.1)	
Body mass index (kg/m^2)	30.5 ± 6.0	31.7 ± 6.7	[a]**0.044**
Diabetes mellitus	57 (18.3)	96 (29.8)	[a]**<0.001**
Preoperative opioid use	110 (35.4)	121 (37.6)	0.564
Current tobacco use	45 (14.5)	56 (17.4)	0.316

Data shown are calculated means ± standard deviation or count (percentage). Units are the number of events unless otherwise noted. Mean, standard deviation, and percentage rounded to nearest 10th. Percentages may not equate to 100%.

Abbreviations: kg/m2, kilogram per meter squared

[a]Indicates statistically significant difference at $P \leq 0.05$.

Variable	Dexamethasone Group (N=311)	Control Group (N=322)	*P* Value
Days			
Pre	40.3 ± 42.9	38.4 ± 36.9	0.650
Post 1 week	9.3 ± 2.9	9.2 ± 3.5	0.502
Post 6 weeks	41.6 ± 5.6	42.1 ± 6.6	0.547
Post 3 months	81.5 ± 13.9	83.6 ± 13.6	0.069
Post 6 months	152.6 ± 26.2	156.2 ± 27.2	0.264
Post 1 year	313.7 ± 65.2	315.0 ± 64.9	0.756
Post 2 years	681.0 ± 62.3	675.4 ± 55.3	0.646
VAS			
Pre	5.9 ± 2.4	6.1 ± 2.4	0.251
Post 1 week	4.4 ± 2.6	4.7 ± 2.6	0.181
Post 6 weeks	3.9 ± 2.5	3.9 ± 2.6	0.880
Post 3 months	3.5 ± 2.5	3.2 ± 2.5	0.208
Post 6 months	2.9 ± 2.8	2.8 ± 2.6	0.877
Post 1 year	3.8 ± 3.2	3.7 ± 3.4	0.623
Post 2 years	3.6 ± 3.4	3.5 ± 3.3	0.902
PROMIS-PI			
Pre	62.7 ± 4.5	64.5 ± 7.1	0.574
Post 1 week	64.5 ± 4.7	68.7 ± 4.7	0.264
Post 6 weeks	62.3 ± 8.6	67.5 ± 5.5	0.212
Post 3 months	58.5 ± 5.7	57.3 ± 7.6	0.815
Post 6 months	54.8 ± 6.6	61.2 ± 6.1	0.078
Post 1 year	60.7 ± 6.9	60.8 ± 6.9	0.982
Post 2 years	65.5 ± 5.8	59.4 ± 7.2	0.121
PROMIS-D			
Pre	47.3 ± 11.3	50.0 ± 2.8	0.415
Post 1 week	45.5 ± 7.3		
Post 6 weeks	47.5 ± 12.2	44.0 ± 2.8	0.410
Post 3 months	43.5 ± 8.8	45.0 ± 1.4	0.703
Post 6 months	43.3 ± 8.8	51.0 ± 7.5	0.156
Post 1 year	50.7 ± 17.2	47.3 ± 2.5	0.651
Post 2 years	58.0 ± 5.7	49.6 ± 5.7	0.225

Table 2. Pre- and Postoperative VAS and PROMIS Scores

Data shown are calculated means ± standard deviation. Units are noted. Mean and standard deviation rounded to nearest 10th.

Abbreviations: Pre, preoperatively; post, postoperatively; PROMIS, patient-reported outcomes measurement information system; VAS, visual analog scale.

[a]Indicates statistically significant difference at $P \leq 0.05$.

Variable	Dexamethasone Group (N=311)	Control Group (N=322)	*P* Value
MME			
Post 1 week	523.3 ± 372.5	584.1 ± 331.4	[a]**<0.001**
Post 6 week	432.2 ± 1008.2	402.5 ± 701.3	0.822
Post 3 months	224.9 ± 843.7	262.3 ± 659.8	[a]**0.006**

Table 3: Postoperative Opioid Consumption

Data shown are calculated means ± standard deviation. Units are MME. Mean and standard deviation rounded to nearest 10th.

Abbreviations: MME, milligram morphine equivalent; post, postoperatively.

[a]Indicates statistically significant difference at $P \leq 0.05$.