

Does preoperative marijuana use affect postoperative outcomes after total knee arthroplasty?

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Introduction

- Marijuana use is on the rise and is legally available in many U.S. states.
- Cannabinoids found in marijuana are known to impact pain perception, much like opioids.
- Cannabinoid and opioid receptors are found within the same pain pathways and have been shown to function synergistically.
- Given this, they may also have similar pain sensitization and tolerance potential when used regularly.
- Chronic marijuana use may negatively impact pain management after surgery for patients undergoing elective procedures such as joint replacement.
- This study evaluates the effect of marijuana use on postoperative pain after total knee arthroplasty (TKA).

Methods

- We retrospectively reviewed patients undergoing primary, elective unilateral TKA between January 1, 2016 and December 15, 2019.
- Patients actively using marijuana preoperatively were compared to non-marijuana using (non-MU) patients.
- Outcomes included pain scores, postoperative narcotic use, and patient satisfaction.
- Active marijuana use was defined as any use (medical and recreational) within one month of surgery.
- Only tetrahydrocannabinol (THC) containing products were included.
- Patients with a history of chronic narcotic or alcohol use were excluded.

Figure 1. Total MEDD

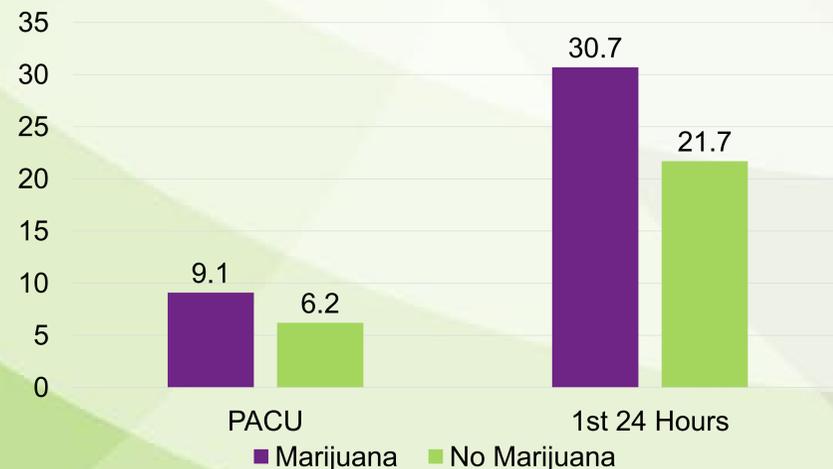
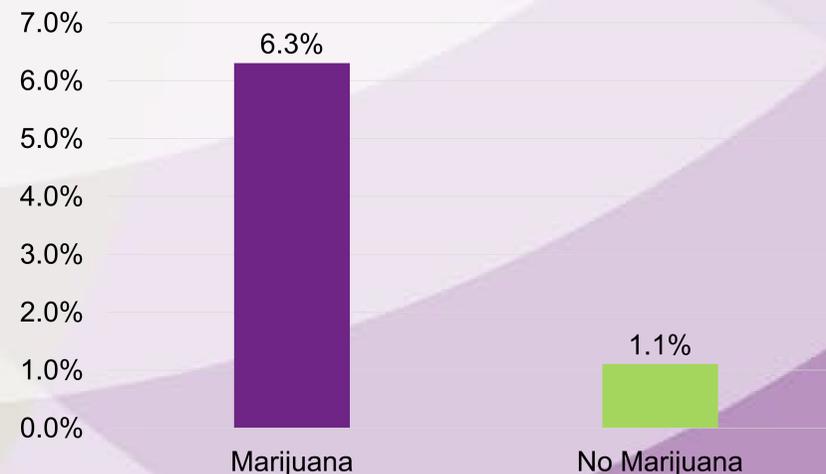


Table 1. Outcomes for MU patients and non-MU patients

	MU Patients	Non-MU Patients	p
N	133 (2.1%)	6,119 (97.9%)	
Age (mean ± S.D.)	62.4 ± 7.84	67.8 ± 9.14	<0.001
Gender (M/F)	38.8%/61.2%	61.7%/38.3%	<0.001
% Spinal anesthesia	46.2%	47.7%	0.720
Average pain score in PACU (mean ± S.D.)	4.4 ± 2.89	3.6 ± 2.60	0.007
Average pain score in 1st 24 hrs (mean ± S.D.)	4.5 ± 1.63	4.0 ± 1.41	<0.001
Total MEDD in PACU (mean ± S.D.)	9.1 ± 5.76	6.2 ± 4.34	<0.001
Total MEDD in 1st 24 hrs (mean ± S.D.)	30.7 ± 33.31	21.7 ± 15.38	<0.001
3-month patient satisfaction			0.628
Fully satisfied	90.5%	82.9%	
Partly satisfied	9.5%	15.9%	
Not satisfied	0.0%	1.2%	
1-year patient satisfaction			0.021
Very satisfied	62.5%	61.5%	
Satisfied	27.1%	26.9%	
Neither satisfied nor dissatisfied	2.1%	6.5%	
Unsatisfied	2.1%	3.9%	
Very unsatisfied	6.3%	1.1%	
1-year patient satisfaction (Summarized)			0.323
Satisfied (including "very satisfied" and "satisfied")	91.5%	94.6%	
Unsatisfied (including "very unsatisfied" and "unsatisfied")	8.5%	5.4%	

Figure 2. Percentage "Very Unsatisfied" at 1 Year Post-TKA



Results

- 6,252 patients were included, 133 patients were identified as active marijuana users.
- MU patients were slightly younger than the non-MU patients (p<0.001).
- Females made up 61.7% of active MU patients (p<0.001).
- MU patients had significantly higher:
 - Average pain scores in the post-anesthesia care unit (PACU) (p=0.007) (Table 1)
 - Average pain scores in the first 24 hours postoperatively (p<0.001) (Table 1)
 - Total morphine equivalency daily doses (MEDD) in the PACU (p<0.001) (Figure 1)
 - MEDD in the first 24 hours postoperatively (p<0.001) (Figure 1)
- There was no difference, in anesthesia technique between the two groups, (Table 1)
- At 3 months postoperatively 100% of MU patients were fully or partly satisfied with their operative results, whereas 1.2% of non-MU patients remained dissatisfied. (Table 1)
- At 1 year postoperatively there were more dissatisfied MU patients (8.5%) than non-MU patients (5.4%).
- Of these, 6.3% of MU patients were "very unsatisfied" compared to only 1.1% of non-MU patients (p=0.021) (Figure 2).

Discussion

- This study demonstrates that both pain scores and narcotic demand are higher in MU patients postoperatively.
- Although pain scores were significantly higher the clinical importance of these differences is likely inconsequential.
- Differences in narcotic use were statistically significant and clinically relevant.
- Patient satisfaction at 3 months was higher in the MU patients. These same patients had less satisfaction when queried at 1 year.
- The "very unsatisfied" patients were largely marijuana users, raising concerns of long-term dissatisfaction in this group.
- Our data suggest that patients who use marijuana preoperatively may suffer both short-term pain management consequences and long-term dissatisfaction after TKA.
- The concept of marijuana cessation prior to surgery should be further explored. Additionally, the timing of discontinuation needs to be elucidated.

References

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