Jeffrey P. Mauras
L2
LSU Health Sciences Center, New Orleans, LA

Mentor: Vinod Dasa, MD
LSUHSC, Director of Clinical Orthopaedics, Director of Research

Opioid Use after TKA in Patients Receiving Cryoneurolysis Alone Versus Cryoneurolysis Plus Liposomal Bupivacaine

Introduction: Total knee arthroscopy (TKA) is a common surgery with a painful recovery. Two promising modalities to reduce pain and opioid consumption following TKA are preoperative cryoneurolysis and intraoperative local infiltration of liposomal bupivacaine. Preoperative cryoneurolysis targets the infrapatellar branch of the saphenous nerve and anterior femoral cutaneous nerve, and liposomal bupivacaine is a local anesthetic. The benefits of preoperative cryoneurolysis or liposomal bupivacaine alone have been shown in other studies. To our knowledge, no study to date has examined whether the combination of preoperative cryoneurolysis and intraoperative liposomal bupivacaine is superior to cryoneurolysis alone.

Materials & Methods: This was a retrospective chart review of patients who underwent primary TKA performed by a single surgeon at a university-based tertiary care hospital. We compared opioid use following TKA in patients who received either perioperative cryoneurolysis plus intraoperative liposomal bupivacaine (Cryo + Bupiv) or cryoneurolysis alone (Cryo) as part of a multimodal pain management approach. Patients who did not receive opioids were excluded. The Cryo group were treated from January 2017 to March 2018 while the Cryo + Bupiv group were treated from March 2018 to April 2019. Cryoneurolysis was administered 5 days prior to surgery. The primary outcome was total Morphine Milligram Equivalent (MME) prescribed per patient following TKA.

Results: A total of 179 patients were included, with 105 in the Cryo + Bupiv group and 74 in the Cryo group. The Cryo + Bupiv group had a significantly lower total MME compared with the Cryo group (984 vs 433 MME, $p < 0.0001$). An MME of 984 is equivalent to about 131 pills of 5 mg oxycodone whereas an MME of 433 is equivalent to about 58 pills of 5 mg oxycodone.

Discussion/Conclusion: This study shows that a multimodal pain protocol that includes perioperative cryoneurolysis and intraoperative liposomal bupivacaine provides superior pain control as evidenced by significantly lower opioid use post TKA compared to cryoneurolysis alone. Limitations of this study included that patients were treated during different periods of time and that opioid use was based on prescription data rather than on actual use. Future research that prospectively examines post-TKA outcomes, such as range of motion, patient-reported outcomes, and objective function tests, in addition to opioid use in patients randomized to different multimodal pain regimens is warranted.