Stephan G. Frangakis, MD, PhD
Duke University School of Medicine, Durham, NC
Analgesic Effects of Perioperative Propranolol Administration for Spine Surgery

Abstract

β-adrenergic receptors have been known for some time to be implicated in the development and transmission of nociceptive stimuli, by both directly increasing the excitability of primary afferent nociceptors as well as increasing production of pro-inflammatory cytokines. Antagonism of the β-AR through both selective and non-selective β-blockers has shown utility in preventing and alleviating chronic and acute pain. β-blockers therefore represent an emerging class of drugs for the treatment of surgical and functional pain. Here we propose an investigation into the analgesic properties of the non-selective β-blocker propranolol in post-surgical pain after lumbar fusion surgery. Patients will be randomized to receive either oral propranolol or placebo for the 3 days prior to surgery, the morning of surgery, and post-operative day 1 and 2. The primary outcome measure will be assessment of post-operative opioid use at 24 hours. Additionally, blood samples will be collected from enrolled participants for evaluating blood levels of inflammatory cytokines and profiling immune system activity. Secondary outcome measures will be opioid use and pain scores at 48 hours, 1 week, 1 month, and 3 months postoperatively. We anticipate that patients receiving oral propranolol perioperatively will have lower postoperative pain scores and opioid use, as well as decreased serum levels of inflammatory markers.