Post-Operative Liver Pain Protocol – Intraoperative Regional Blocks

Background:
Current pain management strategies for Liver Transplantation rely heavily upon post-extubation narcotic use in the intensive care unit (ICU) with little use of intraoperative strategies or multimodal analgesia. In the setting of expanding ERAS (Enhanced Recovery After Surgery) protocols for abdominal and non-abdominal surgeries, as well as a general push to develop “Fast Track” protocols for liver transplantation, heavy use of post-operative opiates likely runs antagonistic to enhanced recovery goals. This study examined the current strategies for intraoperative and post-operative pain control, post-extubation pain scores, and oral morphine equivalent (OME) requirements for 17 patients which underwent Liver Transplantation at a large academic hospital over the course of 3 months. A large variability of pain regimens was noted, resulting in substantial differences in pain scores and OME requirements between patients. Overall OME use, however remained substantially high in the first 48 hours after extubation in the ICU (on average 350 OMEs), with little use of multimodal strategies. This suggests a need for a standardization of post-operative pain regiments, with possible early adoption of multimodal analgesia, as a method for improving morbidity and decreasing ICU and hospital stay for patients undergoing liver transplantation.

Goal:
The goal of this protocol is to standardize the post-operative pain modalities given to liver transplant recipients in the immediate post-operative period. Once this protocol is in place, we aim to collect a set of standardized data (pain scores, OME use, etc) from which to compare further interventions against.

Protocol:
Note – This protocol is designed to start only once the patient is extubated.

- Dilaudid PCA (0.1 – 0.3 mg q10 min, 0.5 – 1.5 mg one hour limit) or Fentanyl PCA (8 – 12 mcg q 6-10 min, 64 – 96 mcg one hour limit), per the discretion of the ordering provider.
- 650 mg Tylenol q8 hr scheduled, once patient is taking PO (not to exceed 2g per day)
  - Liver glucuronidation and sulfation have been shown to be impaired in the first 10 days after liver transplant, which leads to enhanced NAPQI formation. Despite this, several studies have shown that acetaminophen is safe to use in post-operatively in liver transplants (even before enzymes have returned to baseline) as long as doses are equal to or less than 3mg per day and no single dose is above 1g. This has been shown to be Class IIC evidence.
- Early consideration for lidocaine infusion (0.25 – 1.25 mg/kg/hr, titrated per lidocaine levels) if pain not well controlled
  - This can be initially ordered by the ICU team, however a consult to the acute pain service will need to be done for further management once the patient leaves the ICU.
• Recommendation to start lidocaine infusion at 0.25-0.5 mg/kg/hr and titrate upwards, as the liver metabolizes lidocaine.

• Early consideration for ketamine infusion (0.15 mg/kg/hr – 0.35 mg/kg/hr) for cases of extreme pain not controlled by the above
  o This can be initially ordered by the ICU team, however a consult to the acute pain service will need to be done for further management once the patient leaves the ICU.
  o Recommendation to start ketamine infusion at 0.15-0.2 mg/kg/hr and titrate upwards, as the liver metabolizes ketamine.

• If pain continues to be an issue, a consult to the acute pain service is warranted for further recommendations.

• Of note, gabapentin and NSAIDS have not been clearly shown to be of benefit in liver transplantation and have been of concern to produce increased risk of reintubation and increased bleeding, respectively.

References: