Peripheral Nerve Block for Pain Crisis in Sickle Cell Disease
Burns M MD, Weber G. MD Department of Anesthesiology NYMC

INTRODUCTION

Opioids are used as the primary mode of analgesia to control the pain of a vaso-occlusive episode (VOE) in sickle cell disease (SCD). The efficacy of opioids decreases with chronic use and is associated with significant side effects. There is evidence that increased morphine exposure is associated with higher incidence of acute chest syndrome and nephropathy in SCD. We present a novel treatment for pain control during VOE with very difficult to control pain despite multimodal IV analgesia.

CASE REPORT

• Nine year old HbSS male presented for pain management of a VOE.
  • He had history of multiple admissions for VOEs treated with hydromorphone PCA and maximum recommended doses of IV ketorolac and acetaminophen, with a normal length of stay of nine days.
  • His primary complaint on this admission was worsening pain in his right heel, evidenced by continuous 9-10/10 pain and escalating usage of hydromorphone PCA (day one 2mg, day two 4.4mg, day three 6.8mg).
  • On day 3, with continued severe pain, we discussed with his mother and placed a sciatic nerve catheter at the popliteal fossa; an infusion of ropivacaine 0.1% was used.
  • After the CPNB his pain scores improved to 0-2/10, hydromorphone usage decreased to 3.6mg over the next 24 hours and he could ambulate with minimal assistance.
  • Day 4 he was placed on his home regimen of tramadol PO with scheduled PO acetaminophen.
  • Day 5 the catheter was removed and he was discharged home morning of day 6.

CONCLUSIONS

• The chronic inflammation of SCD results from a cycle of ischemia/reperfusion, causing upregulation of ICAM, worsening RBC-leukocyte adhesion to the endothelium of post-capillary venules.
  • We used 0.1% ropivacaine to limit sensory and motor block, permitting mainly sympathetic block which allowed increased circulation and participation in physical therapy.
  • Our patient had better pain control, required half the opioid dose prior to CPNB and seemed to have faster resolution of his VOE as evidenced by his reduced LOS.

REFERENCES


DISCUSSION

• Local anesthetics are known to have systemic anti-inflammatory effects. They decrease adherence of leukocytes to endothelium and reduce the priming effect of systemically release interleukins. CPNBs are associated with systemic absorption of local anesthetic and there may be some beneficial effect from this.
  • PNBs cause greater local tissue oxygenation, also possibly of help in this ischemic pathology.
  • Use of local anesthetic epidurals for analgesia in VOEs points to improved pain control.
  • Postoperative CPNB have been shown to reduce opioid consumption, improve pain control and reduce clinical inflammation.
  • PNB also decreases serum markers of inflammation postoperatively (CRP, leukocyte count) although the evidence here is stronger for epidurals than CPNB.
  • In an incisional model of induced inflammation, PNBs were associated with faster resolution of inflammation.
  • We believe the CPNB reduced inflammation, blocked sympathetically drive adhesion and allowed a faster recovery with improved pain control.
  • We found only a single pediatric case of femoral CPNB for VOE which reported better pain control but no information on decrease in opioids or LOS.
  • More research needs to be done to ascertain if this was a real positive effect.