Cosyntropin Compared to Epidural Blood Patch In the Treatment of Postdural Puncture Headache (PDPH)

Steven Hanlining CDR, MC, USN; Joseph E Lagrew, LT, MC, USALin Quilkol LCDR, MC, USN; Derrick Colmenar LCDR, MC, USN; and Carol Drastol

1. Naval Medical Center San Diego, Department of Anesthesiology, 2. Commander Naval Surface Forces, U.S. Pacific Fleet, Medical Readiness Division and 3. Naval Medical Center, Portsmouth

OBJECTIVE

HYPOTHESIS: Cosyntropin is equivalent to epidural blood patch in the treatment of post dural puncture headache as measured by patient self reported pain and function scores.

OBJECTIVE: Compare efficacy of cosyntropin to epidural blood patch for postdural puncture headache.

BACKGROUND

• Epidural blood patch (EBP) is standard treatment for PDPH.
• EBP was originally thought to be < 30% effective
• Increased pain follow up showed persistent relief in only 10% of patients
• EBP requires trained personnel, has numerous contraindications, and is associated with complications including severe back pain, hypotension, bradycardia, hypovolemic shock, and cerebrospinal fluid leak (CSF leak).
• Other treatments
  - Dexamethasone, gabapentin, intravenous hydrocortisone, epidural morphine, and betamethasone have shown potential for pain relief after failed EBP.
• Adrenocorticotropic hormone (ACTH) and synthetic analogs have shown efficacy in both treatment and prophylaxis compared to placebo.
• Proposed mechanisms of corticosteroid intrathecal endorphin release, anti-inflammatory action, fluid and electrolyte retention as well as possible direct stimulation of central spinal fluid production.
• No study directly comparing effectiveness to EBP

STATISTICAL ANALYSIS

• Demographics, headache characteristics, and patient status compared using Student's t-test for continuous variables and Fisher's exact test for categorical variables.
• Paired and unpaired t-tests were used to compare pre-EBP and post-EBP treatment to control group using Student's t-test.
• Based on intent to treat analyses included all patients regardless both treatments.

RESULTS

• 30 patients where consented for the study from 2006 to 2013 and 26 where randomized to cosyntropin or epidural blood patch.
• Baseline information for the control and study cohorts showed no difference based on age, gender, indication for dural puncture, demographic, medical history, headache symptoms, or baseline pain and function scores.
• Intranasal cosyntropin was equivalent to EBP in relieving PDPH at 3 and 7 days based on intent to treat analysis.

CONCLUSION

• First study to demonstrate equivalence of blood patch to PDPH.
• Reasonable to consider IV cosyntropin as the treatment of choice for patients in whom EBP is contraindicated. (Patient preference, coagulopathy, pseudocyst formation).
• Possible CNS in systems infections, local infection at the site of the EBP and disseminated intravascular coagulation, inability to access the epidural space, or lack of trained personnel.
• IV cosyntropin is a viable treatment option to EBP for treatment of PDPH in austere environments where there is limited or no access to anesthetized trainees.
• Proposed mechanism of corticosteroid intrathecal endorphin release, anti-inflammatory action, fluid and electrolyte retention as well as possible direct stimulation of central spinal fluid production could reasonably account for the delayed response to treatment shown in this study.
• Regimen prescribed in this study is moderate to conservative in all measures except that it was administered intravenously instead of intramuscularly. This suggests the possibility of a better dose response with longer infusion times, increased titration steps, or ability to repeat dose.
• Future research: compare efficacy and cost of prophylaxis to treatment of PDPH with intranasal cosyntropin; evaluation of a larger population for comparison of serious adverse effects of IV and EBP; cosyntropin validation of results of this study in larger cohort; and evaluation of the most effective dosing regimen of cosyntropin.

REFERENCES

16. Duffey GR. The management of headache following accidental dural puncture. Anesthesiology. 1994;70:208-211.