

[NM-246] Factors Associated with Refractory Post-Dural Puncture Headache (PDPH) and success of Epidural Blood Patch (EBP)

Mathew E, Romeo D, Mavi J, Johnson K, Sadhasivam S
Cincinnati Children's Hospital Medical Center , Cincinnati , OH, USA

Background: PDPH is a common complication of diagnostic and therapeutic lumbar puncture (LP), or inadvertent dural puncture with epidural analgesia. Most PDPHs occur within 3 days of the procedure due to CSF leak resulting in intracranial hypotension (1,2). Intracranial hypotension can cause abducens palsy and brain herniation through the foramen magnum. Occurrence of PDPH relates to needle gauge, type of needle tip, needle orientation, operator skill, and risk factors such as age or prior history. Initial treatment of PDPH involves conservative measures such as bed rest, analgesics, caffeine, and fluids; persistent PDPH may require EBP. There have been few cases of PDPH reported in children and even fewer reports of EBP for PDPH treatment. A previous study of 7 children under the age of 12 years demonstrated 0.2-0.3ml/kg of blood injected during EBP relieved PDPH(4). Our aim is to determine factors associated with severe PDPH requiring EBP as well as factors associated with successful relief from EBP in our large pediatric population.

Methods: Charts of patients with PDPH who received EBP between January 1 2007 and November 1 2013 were reviewed. The following data were collected and analyzed: age, gender, weight, initial procedure type causing PDPH symptoms, interval between LP and headache, medical interventions utilized, EBP procedure information including timing, volume of blood injected, need for sedation/anesthesia to perform EBP, outcome of EBP, time to relief of symptoms, incidence of back pressure and other complications, if any.

Results: 39 patients had EBPs for PDPH during the study period. The mean age was 16 +/- 4.8 years; >80% of patients requiring EBP were >12 years or age ($p < 0.0001$). Girls (63.4%) had more EBP than boys. Most PDPH (70.8%) were due to diagnostic LP. PDPH secondary to epidural analgesia was roughly 7/1750, or 0.4%. 35 out of 39 PDPH patients (90%) achieved complete headache relief ($p < 0.0001$) with EBP. Age is not a significant predictor of EBP success. A mean volume of 20mL (0.32ml/kg) of blood was used for EBP, with a range from 5 to 40mL. Though not statistically significant (due to small sample size), those patients who had complete PDPH relief received more blood volume (median 0.27ml/kg, range 0.05-0.7) than those who had no relief or partial relief (median 0.20ml/kg, range 0.06-0.21, $p = 0.21$). There were no complications from EBP therapy.

Conclusion: EBP therapy has strong utility in the pediatric population for relief of PDPH, particularly for those due to larger needle punctures. This is an uncommon complication of epidural analgesia (0.4%), as most EBPs resulted from diagnostic and therapeutic LP. Older patients (>12 years) and girls had higher incidences of PDPH requiring EBP. There was a trend toward higher blood volume (0.27ml/kg) with successful EBP, and we did not find a minimum volume of blood necessary to achieve relief; this could be due to small sample. The volume of injectate in awake patients undergoing EBP therapy is often titrated to effect and limited by untoward symptoms such as back tightness. None of our patients undergoing EBP therapy under GA reported complications. Further large studies should be undertaken to better elucidate the minimum volume necessary for success.
