Continuous Epidural Analgesia for a pediatric patient in Neurologic Crises who carries a Diagnosis of Hepatorrenal tyrosinemia (HT1)

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ABSTRACT BODY: A 27 month old, 11.7 Kilograms white male with HT1 diagnosed at 1 1/2 months of life. The child presented flu like symptoms including fever, irritability, vomiting and decreased appetite; along with painful abdominal and leg cramps for ten days. His parents reported painful episodes of leg cramping activity that lasted up to several minutes with only brief periods of relief. These episodes were characterized by the arching of his back leg extension; inconsolable crying. Worsening leg pain with inability to bear weight prompted his admission to the pediatric intensive care unit. His examination was remarkable for mild distress, irritability, Tº max 38.4°C, BP 123/74 mmHg, HR 169 beats/min, RR 33 breaths/min; and lower extremities with hypertonicity of the extensor group. Intravenous (IV) Lorazepam caused hallucinations; IV infusion of fentanyl at 1 ug/kg/min caused respiratory depression. This was reversed with supplemental oxygen and naloxone. The Pediatric Pain Service placed a lumbar epidural and an infusion of bupivacaine 0.25% was started at 2 milliliters/hour and adjusted to the patient's comfort. The epidural relieved his spasmodic leg pain, help to normalize his blood pressure and provided pain relief in the postoperative period after his orthotopic liver transplant that was performed to treat the disease.

Discussion: Tyrosinemia type I or HT1 is an autosomal recessive inborn error of metabolism with impaired activity of fumarylacetoacetate hydrolase that catalyzes the last step of tyrosine degradation. Tyrosine, a semi-essential amino acid, is the starting point for the synthesis of catecholamines, thyroid hormones, and melanogenesis. Neurologic crises are important causes of morbidity and mortality in HT1. Common symptoms in these crises include hypertonia; painful paresthesia accompanied by opisthotonic posturing or generalized weakness that may require mechanical ventilation. Vomiting, seizures, self-mutilation, hypertension, and hyponatremia are additional features of the disease. Average age of onset of these crises is 11.7 months (range 1-21), and half of them are preceded by infection, usually of the upper respiratory tract. Pain therapies for management of these neurologic crises are limited by their side effects. Some clinical evidence suggest that accumulation of d-aminolevulinic acid (d-ALA) is partially responsible for the neurologic symptoms in acute intermittent porphyria, hereditary deficiency of d-ALA dehydratase, and lead poisoning. Due to hypothetical similarities among the neurology crises some authors have used hematin. Liver transplantation resolves the impairment, but has limited availability and variable response among patients. New therapies like the one presented in this report show a different approach to ease the management of these neurologic crises. Increased use of epidural analgesia in the pediatric population outside of the operating room has improved the management of cancer, burn, and multiple trauma pain, improved regional blood flow, and reduced tissue metabolism. Anecdotal case reports document the efficacy of these applications in pediatric patients with meningococcaemia, erythromelalgia, Kawasaki's disease and vaso-occlusive episodes in one case series of sickle cell patients. The efficacy of this analgesic modality in this case report, is supported by the knowledge that local anesthetics are not listed as agents that precipitate accumulation of d-ALA.

References
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