E-070  TRENDS IN PEDIATRIC NEUROINTERVENTIONAL RADIOLoGY: A SURVEY OF A 23-YEAR EXPERIENCE IN INFANTS LESS THAN ONE YEAR OF AGE


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Background and Purpose Pediatric neurointerventional radiology is an evolving subspecialty with growing indications and technological advancement such as miniaturization of devices. The ability to perform these procedures is continuously balanced with necessity given the inherently higher risks of radiation and cerebrovascular injury in infants. Endovascular treatment of arteriovenous shunting lesions including vein of Galen malformations (VOGM), arteriovenous malformations (AVM) and arteriovenous fistulas (AVF) has been well established in pediatric patients including those of a very young age. More recently, intra-arterial chemotherapy (IAC) for the treatment of retinoblastoma has been used in this age group. The purpose of this study is to review our institution’s neurointerventional experience in infants less than 1 year of age in order to elucidate trends in this delicate patient population.

Methods We retrospectively identified 123 patients from a neurointerventional database spanning 23 years (January 1997-October 2020) who underwent 209 procedures. Treatment type, indication, and location as well as patient demographics were extracted from the medical record. We excluded 7 patients with an age of greater than one year at the time of procedure as well as those with procedure requests without completion.

Results Neurointerventional procedures were performed as early as day of life 0 in a patient with an AVM resulting in hydrops fetalis. Average age of intervention in the first year of life is 5.8 months, and 37 of 209 procedures were completed in neonates (less than one month of age). IAC for the treatment of retinoblastoma comprised 33% of neurointerventional procedures completed in infants less than one year of age followed by lymphatic malformations (19%), VOGM (13%), and dural AVF (10%). Less frequent indications include non-Galenic pial AVF (4%) and tumor embolization (2%). Only 4 of 209 angiograms were negative. The total number of interventions has increased which is likely secondary to the onset of retinoblastoma treatment in 2010 at our institution.

Conclusion The introduction of IAC for the treatment of retinoblastoma in the last decade is the primary driver for the increased trend in neurointerventional procedures completed in patients less than one year of age from 1997 to 2020.

REFERENCES

The relationship between cerebral vasospasm and herpesvirus reactivation after aneurysmal subarachnoid hemorrhage

Background Aneurysmal subarachnoid hemorrhage (aSAH) is a devastating disease frequently leading to death or poor functional outcome. A major source of disability from aSAH is the development of cerebral vasospasm, which is defined as narrowing of the large and medium-sized intracranial arteries. Limited information exists regarding underlying anatomic mechanisms of vasospasm after aSAH. Based on the anatomic location of resident herpesvirus and their activation in response to adrenergic stress, we propose that herpesvirus reactivation in response to adrenergic activation of head and neck ganglia during aSAH will be temporally related to cerebral vasospasm.

Methods We developed an IRB-approved protocol for non-invasive bedside testing of viral shedding in tears and saliva in aSAH patients. The protocol was a joint effort with Infectious Disease and our virology laboratory. Viral specimens and catecholamines were obtained at admission and at days 4, 7, 10 and 14 post-aSAH. These values were compared to standard-of-care metrics including transcranial doppler, clinical examination and radiological studies. Herpesvirus serology was also obtained.

Results Our protocol successfully yielded samples for analysis in all cases. Initially, serum catecholamines were utilized but collection methodology and requirements resulted in unusable samples. Further, many patients require pressor support using parenteral catecholamines and serum results may not be valid during hospitalization. Instead, salivary alpha-amylase is being tested as a surrogate marker, with collection limited to those patients not requiring catecholamine pressor support within the previous 24 hours. In our preliminary dataset, integrity of viral shedding and catecholamine measurement in post-aSAH patients. The specimens are captured during the patient’s hospitalization and allow us to study the relationship between reactivation of chronic herpesvirus infection and cerebral vasospasm after aSAH.

Conclusion We have developed a novel tissue banking protocol for the analysis of viral shedding and catecholamine measurement in post-aSAH patients. The specimens are captured during the patient’s hospitalization and allow us to study the relationship between reactivation of chronic herpesvirus infection and cerebral vasospasm after aSAH.

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