

**MetroHealth Medical Center**  
**RESEARCH DAY 2023**  
**Abstract Submission Form**

**Poster Title:** Dexamethasone as a Protective Factor Against Development of Hydrocephalus Following Hemispherectomy Surgery

**Authors:** Nikita Das, B.A., Akshay Sharma, M.D., Ravi Dhamija, B.A., Richard Rammo, M.D., William Bingaman, M.D., Demitre Serletis, M.D., Ph.D., FRCSC, Lara Jehi, M.D.

**Presenter's Name:** Nikita Das

**Location of Laboratory:** Cleveland Clinic Neurological Institute, Epilepsy Center

**Category:** Clinical Research

---

**Introduction:** Hydrocephalus, a well-documented sequela of hemispherectomy surgery, may develop due to elevated cerebrospinal fluid (CSF) protein concentrations, intraoperative creation of a communication between CSF and vascular spaces, or induced fibrosis of arachnoid granulations via inflammatory reaction to the postoperative products. Glucocorticoids, particularly dexamethasone, are commonly used postoperatively to limit inflammation. While its effects on hydrocephalus have not been extensively studied, dexamethasone is often used clinically to manage inflammation caused by conditions that can lead to hydrocephalus.

**Objectives:** This study investigates at the population level whether postoperative dexamethasone use in pediatric hemispherectomy patients may be associated with decreased risk of acquired hydrocephalus.

**Methods:** A retrospective study was performed using the TriNetX platform – a health research network containing data from 57 U.S. healthcare organizations – which was queried using procedural codes to identify pediatric patients who have undergone hemispherectomy since 2003. Cohort 1 (n=232) included patients administered dexamethasone within 1 month postoperatively. Cohort 2 (n=120) included patients with no documented dexamethasone administration within 1 month postoperatively. Propensity Score Matching generated final cohorts (n=104) using covariates: gender, race, age at surgery, and history of diagnosed nervous system disease, congenital malformations/chromosomal abnormalities, or neurodevelopmental disorders. Association tests were performed, excluding patients previously diagnosed with hydrocephalus, to determine Risk Ratio (RR) for the occurrence of hydrocephalus within 5 years postoperatively.

**Results:** Hemispherectomy patients who received dexamethasone during their postoperative course exhibited a significantly lower incidence of subsequent hydrocephalus (RR: 0.471, 95% CI: 0.235 – 0.945) within 5 years postoperatively. Kaplan-Meier analysis revealed that dexamethasone-treated patients had a higher estimated survival probability when calculated in relation to hydrocephalus outcomes (p=0.008).

**Conclusions:** This data indicates that postoperative dexamethasone administration may confer a protective effect against the development of hydrocephalus in hemispherectomy patients. Further study is necessary to elucidate the nature of this association and determine the optimal utilization of steroids for patient undergoing complex epilepsy surgery.