Age-Related Complications Following Cerebral Ventricle Drainage Surgical Procedure for Hydrocephalus

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Introduction

• Cerebral ventricle drainage is a procedure for treating hydrocephalus that has relatively high postoperative complication rates, with limited literature on risk factors such as age.

• This study evaluates the association of age and common postoperative complications including mechanical drainage device failure, sepsis, and subdural hematoma in hydrocephalus patients with cerebral ventricle drainage.
Methods

• Using the 2016 National Inpatient Sample database, a retrospective cohort analysis was conducted on 4,715 patients diagnosed with hydrocephalus who received a cerebroventricular drainage procedure with shunt placement.

• Patients were separated into four groups by age: Group 1, 0-20 (n=823, mean=6.43±6.47), Group 2, 20-40 (n=615, mean=30.03±5.68), Group 3, 40-60 (n=1572, mean=50.95±5.51), and Group 4, 60+ (n=1701, mean=70.26±7.69).

• Statistical analysis was conducted using RStudio with Tukey multiple comparisons of means and ANOVA to measure the associations of mechanical device failure, sepsis, and subdural hematoma among age groups.
Results

• There were significantly higher rates of mechanical failure in Group 1 compared to Groups 3 and 4 (p<0.001) and Group 2 compared to Groups 3 and 4 (p<0.001).

• Significantly higher rates of sepsis were found in Group 2 compared to Group 1 (p=0.031), Groups 3 and 4 compared to Group 1 (p<0.001), and Group 3 compared to Group 2 (p=0.033).
Results

- Subdural hematoma was significantly more prevalent in Group 4 compared to all groups (p<0.001).

- Compared to the national average, group 1 had the highest risk for mechanical failure (RR=2.65, 95% CI: 2.13, 3.31, p<0.001), group 3 had the highest risk for sepsis (RR=1.62, 95% CI: 1.30, 2.00, p<0.001), and group 4 had the highest risk for subdural hematoma (RR=2.28, 95% CI: 1.61, 3.23, p<0.001).
Discussion

- Early age was significantly associated with mechanical failure following cerebral ventricle drainage for hydrocephalus, while increased age was significantly associated with both sepsis and subdural hematoma.
Summary Points

- Following cerebral ventricle drainage to treat hydrocephalus:
  - Early age showed significant association’s with mechanical failure.
  - Increased age was significantly associated with sepsis and subdural hematoma.