Readmission and Post-ICU Epilepsy in a Pediatric Neurocritical Care Cohort

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Introduction

- Neurocritical care encompasses high illness severity and a wide range of comorbidities.
- Pediatric Intensive Care Unit (PICU) patients with primary neurologic diagnoses often experience gaps in follow-up care.
- Rates of hospital readmission and development of new-onset epilepsy in these patients are poorly described.

Objective

To characterize the frequency of hospital readmission and development of epilepsy during the year after discharge from a primary neurologic critical illness.

Hypotheses

Aim 1. Seizures during the index hospitalization are associated with readmission.
Aim 2. Patients admitted for traumatic brain injury are more likely to develop post-ICU epilepsy compared to other neurocritical care diagnoses.

Materials and Methods

Tertiary care children’s hospital (1/2013-12/2016)

Aim 1 (Readmission cohort): Inclusion: PICU patients mechanically ventilated for > 3 days, primary neurologic diagnosis, post-discharge insurance data. Exclusion: tracheostomy prior to hospitalization, hospitalization non-survivors.

Aim 2 (Post-ICU epilepsy cohort): Aim 1 cohort with additional exclusions: prior diagnosis of epilepsy, < 9 months insurance data. Univariate and multivariable time-to-event analyses using patient, admission, and hospitalization characteristics to evaluate for risks of readmission (Aim 1) and post-ICU epilepsy defined as maintenance anti-epileptic prescription filled months 6-12 after discharge (Aim 2).

Summary

- Readmissions are common and half occur by 2.5 months after discharge.
- Patients admitted for seizures are at high risk of hospital readmission.
- 28% of patients without pre-existing seizures developed post-ICU epilepsy.
- A small but important proportion of patients develop post-ICU epilepsy despite a lack of seizures during their index hospitalization.

Limitations

- Cohort does not include less severely ill neurocritical care patients who required < 3 days of mechanical ventilation.
- Patients without eligible insurance were excluded.
- Insurance claims for filled medication prescriptions were used to identify epilepsy.
- Reason for readmission data unavailable.

Conclusions

- Post-discharge health resource use was common.
- Usual predictive characteristics (e.g. severity of illness) were not associated with post-discharge outcomes.
- Anticipatory guidance on post-ICU epilepsy should be considered in severely ill patients, even without seizures while inpatient.

Future Directions

- Within a larger cohort, characterize phenotypes of patients at risk for developing epilepsy.
- Confirm these findings in an ongoing prospective cohort study.
- Examine outcomes of patients who receive post-neurocritical care follow-up.