

INTRODUCTION

Patients admitted to the neurocritical care unit (NICU) are often severely ill requiring multiple interventions including mechanical ventilation. However, rates of reintubation and determine predictors of reintubation in NICU have not been well established.

Recent studies have focused on risk factors¹, consequences of reintubation and rates of extubation failure associated with particular diagnosis and for neurosurgical patients²⁻⁴. Patients in neurocritical care are more commonly intubated to maintain airway patency⁵ and one would expect to have a lower overall extubation failure rate compared to the medical intensive care unit.

A prospective observational study was performed to evaluate rate of re-intubation and determine predictors of re-intubation.

METHODS

All consecutive patients admitted to NICU at Baylor St. Luke's Medical Center from July 2017 to March 2018 were included in the prospective observational study. During this period 175 patients were intubated. Data including demographics, primary neurological injury, intubation parameters, reintubation rates, tracheostomy, length of stay and outcomes were collected. Frequencies and mean data was tabulated. Reintubation was defined as being placed back on invasive mechanical ventilation within 72 hours of being extubated.

Table 1: Diagnosis and mean days on mechanical ventilation, length of stay (total) and in ICU.

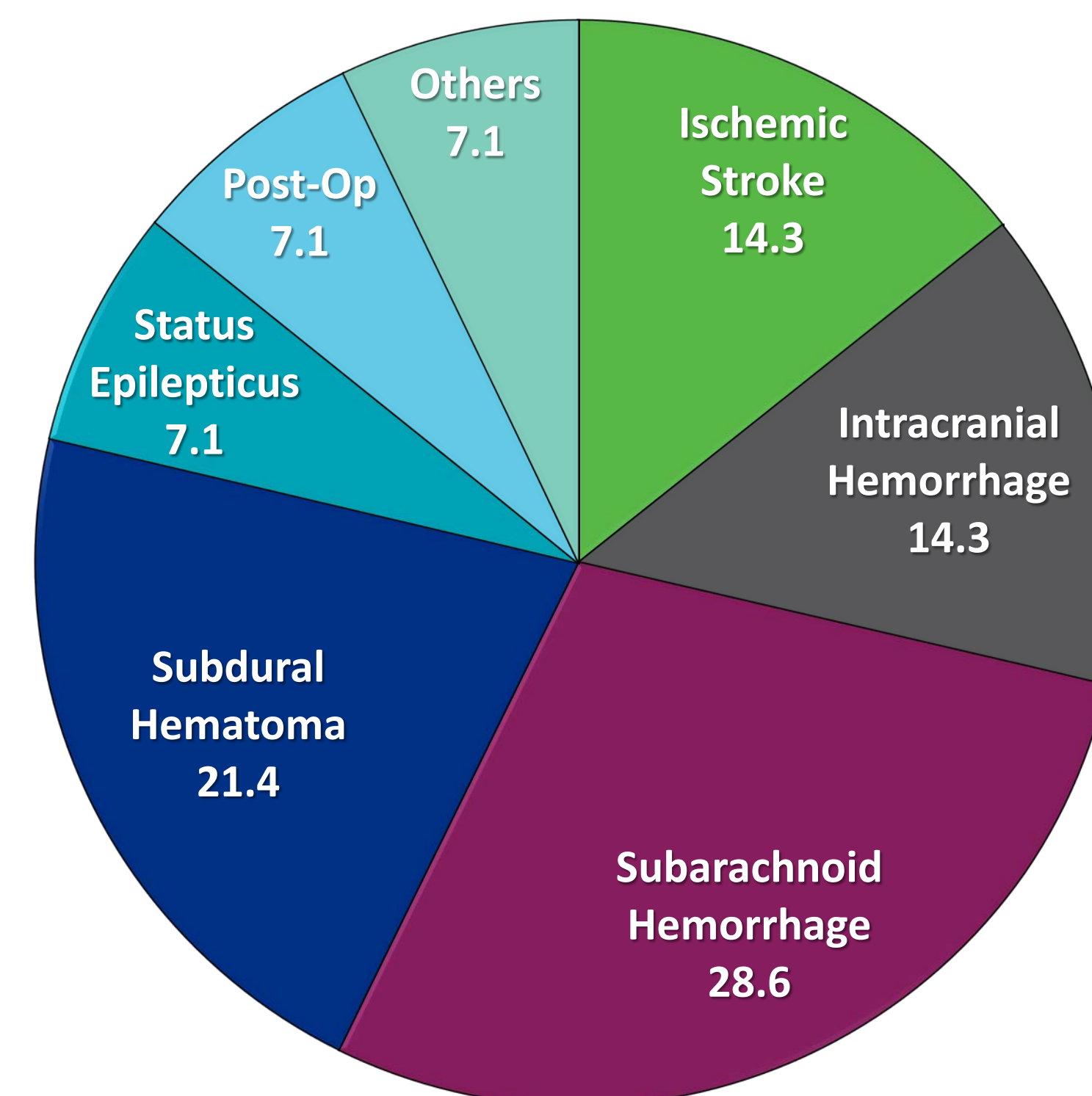
Diagnosis	Mean Days on Mechanical Ventilation	Mean Length of ICU Stay	Mean Length of Hospital Stay
IS	5.7	10.0	14.5
ICH	5.2	8.1	11.6
SAH	4.7	14.0	18.7
SDH	4.3	10.8	19.8
SE	3.6	5.5	11.2
NMD	7.9	10.5	15.4
NEOPLASM	2.0	6.7	16.1
POST-OP	2.2	6.1	13.0
OTHERS	5.1	7.9	17.6

RESULTS

Our cohort contained 175 patients. 39.4% were males (n=69). Mean age was 62. Etiologies of intubation included intracranial hemorrhage (ICH: 14.9%), ischemic stroke (IS: 18.9%), subarachnoid hemorrhage (SAH: 10.3%), status epilepticus (SE: 24.6%), subdural hematoma (SDH: 5.1%), neuromuscular disorders (NMD: 5.1%), neoplasm (4.6%), post-operative (8.6%) and others (8.0%). Rates of reintubation were noted to be 8.0% overall. Among reintubated patients, 21.4% were due to subdural hematoma, 14.3% ischemic stroke, 14.3% intracranial hemorrhage, 28.6% subarachnoid hemorrhage, 7.1% status epilepticus, post-op and other respectively. Mean hospital stay was 23.8 days among patients that were reintubated versus 13.3 days for patients not requiring reintubation. Mean length of ICU stay was 18.0 vs. 7.6 days, respectively. Days on mechanical ventilation for each condition are tabulated in Table 1.

A total of 20 patients required eventual tracheostomy, 25% of which were reintubated during their hospital stay before a decision for tracheostomy was made. Highest rate of tracheostomy was seen in ischemic stroke (6 of 20). Subdural hemorrhage and neoplasm were noted to have 0 tracheostomies.

Figure 1: Percentages of reintubation in each diagnosis.



DISCUSSION

Rates of reintubation in medical intensive care units (MICU) have been well documented in recent literature from 10-20%, and up to 30% for high-risk patients⁶. Our rate of reintubation in the neurocritical care unit was found to be 8.0% overall.

Intubation in neurocritical care unit is more commonly for airway protection⁵, to protect aspiration in the setting of altered mental status, central apnea and neuromuscular respiratory failure⁷ while that is a less common observation in the medical ICU setting, where patients often have multiple co-morbidities leading to acute respiratory failure.

Our study has an inherent limitation, being a single center, short duration study with no long term follow up data. A larger multi-center study is needed to further confirm our finding.

CONCLUSION

The rate of reintubation in the neurocritical care setting was found to be 8.0%. Further studies need to be conducted on predictors of reintubation in neurocritical care.

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