Lisa Lavelanet
Mentor: Dr Sahni
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Title: CPAP vs High Flow: The Road to Discharge

Study Purpose and Rationale:
This is a retrospective study that will be evaluating the differences in outcomes, if any, for neonates born at 24-32 weeks with respiratory distress who are treated with continuous positive airway pressure (CPAP) compared with high flow nasal cannula (HFNC). The outcomes we plan to measure are duration of respiratory support, duration of oxygen requirement, development of bronchopulmonary dysplasia (BPD), and length of stay. Though some comparison studies have been conducted to evaluate various differences between CPAP and HFCN, few have looked at length of stay or age at discharge as a primary outcome. There is some data to suggest that HFNC may have less nasal trauma and pneumothorax than CPAP (Fleeman et al., 2019) (Hong et al., 2019). There is data to suggest that CPAP has a lower rate of reintubation than HFNC (Hong et al., 2019) but some show noninferiority of HFNC compared to CPAP (Colleti Junior et al., 2020). There is also some data to suggest that there are no differences in rates or BDP or death between CPAP and HFNC (Wilkinson et al., 2016). One study did measure differences in age off respiratory support, age at discharge, and age at which patients were at full oral feeds, and all of their outcomes favored CPAP (Hoffman et al., 2016). This study is important because length of stay in the NICU is inversely correlated with neurodevelopmental outcomes (Subedi et al., 2016).

Aims:
The purpose of this study is to investigate the difference, if any, between respiratory outcomes including duration of oxygen treatment, oxygen requirement on day of discharge, age at full feeds, age at full nipple feeds, and length of stay (age at discharge) for infants requiring respiratory support in our NICU.

Study Design:
This is a non-interventional, retrospective study conducted at the neonatal intensive care unit (NICU) at the Morgan Stanley Children's Hospital of New York. All newborn infants admitted to the NICU between April 2020 and April 2021 who required respiratory support while admitted will be included. They will be divided into three main groups. Those who were predominantly supported by CPAP, those who were predominantly supported by HFNC, and those who were about equal. Our primary outcome will be length of stay and our secondary outcomes will be diagnosis of BPD and level of oxygen support still required at discharge.

Data Collection:
Respiratory support is routinely monitored and recorded throughout a patient's stay in our NICU. After study participants are identified, they will be de-identified. We will use 24 hour periods to demarcate a day of CPAP, HFCN, or other form of respiratory support, counting the day for whichever form of support the patient was on for the largest portion of the day.
We will access the electronic medical records of eligible infants to obtain post-menstrual age, type of respiratory support, fractional inspired oxygen, and length of stay. We will obtain this information via Epic. The data will be used to determine which modality of non-invasive respiratory support provides faster discharges, with lower rates of BPD or lower levels of respiratory support at discharge. Written informed consent will not be obtained as this study will be entirely retrospective and data will be de-identified prior to analysis.

Analysis:
The purpose of this study is to investigate the difference, if any, between respiratory outcomes including duration of oxygen treatment, oxygen requirement on day of discharge, age at full feeds, age at full nipple feeds, and length of stay for infants requiring respiratory support in our NICU. We will access the electronic medical record database to identify subjects and obtain demographic data on admission, respiratory support during weaning period and clinical outcomes listed above. These outcomes will be compared between the infants that received CPAP support vs. high flow nasal cannula support using t-test to test our hypothesis.

Study Drugs: Not Applicable

Medical Devices: Not Applicable

Study Questionnaires: Not Applicable

Study Subjects: Neonates admitted to MSCHONY NICU.

Recruitment: Not Applicable

Confidentiality of Data:
All chart review and data storage/analysis will be performed on password protected devices. Patient information will be deidentified at collection. All data collected will only be accessible to study personnel.

Potential Conflict of Interest: None have been identified

Location of Study: Morgan Stanley Children's Hospital (MSCHONY)

Potential Risks: None that have been identified.

Potential Benefits: Data collected and study analyses could lead to improved outcomes for neonates admitted to the MSCHONY NICU.