TITLE: Randomized case control study using Dexmedetomidine prior to intubation in neonates

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INTRODUCTION Neonatal intubations are performed routinely in a NICU. Most intubations are still performed without the administration of medications (awake intubations). Some of the reasons are unavailability of a single good medication, the physician's comfort level, side effects of medications including apnea, bradycardia, hypotension. Some units use a cocktail of different medications.
We are proposing to study the efficacy of dexmedetomidine (precedex) for the purpose of sedation and ease of intubation, prior to intubation in neonates. While there are several reports in the literature of its use for sedation in intubated babies, none of them have specifically looked at its role as a sedative before intubation. This study will look at the efficacy of a single dose of dexmedetomidine compared to controls

The purpose of the study is to look at the efficacy of dexmedetomidine when used as a sedative agent prior to elective intubation in neonates.

Primary objectives: 1. Compare saturation differences between the control and study group 2. Compare time taken to successfully intubate between the control and study group

Secondary objectives: 1. Compare variation in vital signs between the control and study group: heart rate, respiratory rate, blood pressure induced by intubation. 2. Compare number of attempts at intubation between the control and study group

HYPOTHESIS

We hypothesize that sedation with dexmedetomidine before intubation in neonates will:

1. Attain more stability in vital signs during intubation, especially oxygen saturation
2. Shorten intubation time and increase the ease of intubation

We hypothesize that dexmedetomidine at a dose of 0.2 mcg/kg will be more effective than control as a sedative for elective intubation.
The primary endpoint for efficacy will be decrease in desaturations during intubation and a decrease in time take to successfully intubate in the study group. Secondary endpoints will include changes in heart rate, blood pressure, and oxygen saturations (SpO2), induced by intubation and decrease in number of attempts of intubation.

STUDY DESIGN

All neonates admitted to the NICU who require intubation and meet inclusion criteria.

Inclusion Criteria:
All Neonates admitted to the NICU less than 44 weeks corrected gestational age requiring intubation will be eligible for the study. Those babies requiring emergent intubation will not be included.

Exclusion Criteria:

- Neonates with birth weight<1250 grams and <1 week of postnatal age
- Neonates with major congenital malformations
- Neonates with preexisting hypotension (MAP < Gest Age)
- Neonates with complex congenital heart disease and heart block

This is an interventional un-blinded, randomized, prospective pilot study to examine the efficacy of dexmedetomidine in reducing time to intubation, pain/discomfort associated with intubation and maintaining better oxygen saturations in neonates during intubation. The study will be done in the Neonatal Intensive Care Unit within the medical center.
Parents of babies requiring intubation will be approached by the Neonatal attending / fellow to obtain consent for the study. If a consent is obtained, babies will be randomized to a control or study group. Babies in the control group will undergo routine intubation by a neonatologist but with monitoring of the vital signs, those in the study group will receive the study drug 10 minutes prior to intubation.

Data Collection Procedures:
The research data will reside in an encrypted laptop issued by MIS that is housed in the Division of Newborn Medicine within the medical center
The data will be accessible to all researchers. If needed, de-identified data will be stored/shared on the Maimonides share point website for statistical and backup purposes.
The data that will be collected are heart rate, respiratory rate, oxygen saturation, measured continuously, and blood pressure measurement every five minutes. Data will be collected 15 minutes before, during and 30 minutes after intubation.

Data Analysis:
A total of 30 babies will be enrolled, 15 controls and 15 in the medication group. The medication group will receive 0.2 mcg/kg of dexmedetomidine. Since this is a first-in-newborn study we will implement a stopping rule. If >1 patient has bradycardia requiring cardiac compressions, dexmedetomidine will be considered too toxic and the study will be stopped. We will compare time to intubation and the oxygen saturation levels between the two groups. We are anticipating a 20% reduction in time taken to intubate and a 10 % improvement in saturations.

All continuous vital sign data will be summarized with means and std, or medians and IQR and compared with a t-test of wilcoxon rank sum. All categorical and frequency variables will be summarized with N and % and compared with a fisher exact test.
Median time to intubation will be evaluated with K-M curves and product-life estimates, and compared using a likelihood ratio test.

Sample Size:
Sample size was calculated using oxygen saturations of 60 ± 10 in the control group, expecting a 20% increase with a Type 1 (Alpha) error of 0.05, and 85% power.
The sample size calculated was 12 per group, so a total of 24 . We are planning to enroll 30 babies for the study.

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