



Does Using Neuromuscular Blockers Cause Long-Term Negative Effects in Intubated Neonates in the Neonatal Intensive Care Unit (NICU)?

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Introduction

- Extubation Rates in NICU are high
- Hershey's NICU frequently uses Fentanyl and Versed PRN, whereas neuromuscular blocking agents are used in other units of the hospital (PICU) for sedation
- Hard to figure out a balance between harm of too much sedation and leaving a patient in discomfort and pain

Methods

- A literature search was conducted using the following search words:
 - o Neuromuscular Blocking Agents
 - o Intubated Neonates
 - o Long-term effects
 - o Vecuronium
 - o Rocuronium
 - o Neuromuscular Blockers in Children
 - o Neonatal Intensive Care
- The following databases were searched:
 - o PubMed
 - o CINAHL
 - o DynaMed
 - o A total of eight research articles were analyzed

Article	Results
• "Consensus Guidelines for Sustained Neuromuscular Blockade in Critically Ill Children" (2007)	<ul style="list-style-type: none"> o Prolonged immobility may result in muscle atrophy, joint contractures, pressure sores, pulmonary atelectasis with associated pneumonia and corneal drying with potentially permanent corneal damage o Critical Illness Polyneuropathy and Myopathy o Stop sedation every 24 hours for accurate assessment
• "Neuromuscular Blocking Agents in Critically Ill Children" (2002)	<ul style="list-style-type: none"> o Most widely reported complications associated are prolonged muscle weakness or frank paralysis which leads to prolonged period of mechanical ventilation. o Prolonged immobility can result in muscle atrophy and joint contractures, pressure sores, pulmonary atelectasis and associated pneumonia and corneal drying with the potential for permanent corneal damage o Accurate assessments are difficult to obtain due to the severity of sedation. May be desirable to discontinue sedation. o Use should be restricted to situation where the benefits clearly outweigh the possible risks
• "Vecuronium Infusion Requirements in Paediatric Patients in Intensive Care Units: the use of acceleromyography" (1996)	<ul style="list-style-type: none"> o Risk factors for prolonged weakness include hypocalcaemia, renal failure, metabolic acidosis and hypermagnesaemia o Muscle weakness was not present in study
• "Acute Effects of Vecuronium on Pulmonary Function and Hypoxemic Episodes in Preterm Infants" (2007)	<ul style="list-style-type: none"> o Loss of muscle tone during prolonged muscle paralysis may decrease end-expiratory lung volume. o Prior studies in preterm infants have documented decreased pneumothoraces, a shorter duration of oxygen supplementation and reduced risk of intraventricular hemorrhage during muscle relaxation with pancuronium
• "Continuous-Infusion Neuromuscular Blocking Agents in Critically Ill Neonates and Children" (2011)	<ul style="list-style-type: none"> o Joint contractures, specifically in the hips and knees, are prevalent in premature infants but did not appear to persist after discontinuation of drug.

Limitations

- No known experimental studies were found during research
- Majority of studies' populations were children and not specifically neonates

Conclusions

- The research shows there are some acute but no long-term effects found.
- Further research is needed to determine the long term effects on neonates
- Only use neuromuscular blocking agents when the benefits clearly outweighs the negative affects

References

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