Acute Flaccid Myelitis from an Anesthetic Perspective
An Integrated Research Review and Quality Improvement Project Concerning the Prevention of Residual Muscle Weakness and Prolonged Ventilation in Acute Flaccid Myelitis Patients

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ABSTRACT

Objectives: The objective of this study was to identify anesthetic strategies that prevent perioperative residual muscle weakness and prolonged ventilation in acute flaccid myelitis (AFM) patients so that an educational presentation could be developed, and anesthesia providers' knowledge enhanced.

Background: Recent statistics indicate that the incidence of AFM has risen in the past decade and will continue to rise. As a result, it is expected that there will be an increase in surgical patients diagnosed with AFM. This also means that anesthesia providers will encounter this disease more than ever before. Therefore, it is crucial that anesthesia providers have adequate knowledge of the disease and its implications so they can provide anesthetics that optimize patient outcomes. It is also crucial that they are aware of the primary anesthetic concerns in this population and equipped with strategies to prevent these complications.

Design: An integrative research review (IRR) was conducted for research and a Quality Improvement (QI) Project was developed to improve providers' knowledge.

Methods: Databases utilized for this search included EBSCO, Academic OneFile, MEDLINE (Ovid), Google Scholar, Science Direct, and PubMed. The search range was limited to studies less than 6 years old with a date range parameter of 2014-2020. Due to AFM research being scarce, a variety of populations were included. For disease understanding, highly reliable sources and credible health agencies or organizations such as the Centers for Disease Control and Prevention were utilized. For outcomes and intraoperative recommendations, peer-reviewed meta-analyses, literature reviews, randomized control trials, and non-randomized studies were considered. For the QI project, a pretest posttest design was utilized with anonymous participation.

Results: Although this population has very few direct studies, the IRR findings indicated that the primary intraoperative concerns for this patient population are residual muscle weakness and prolonged ventilation. With studies on AFM patients being nearly nonexistent, many of the results were extrapolated from other populations. Studies found that inflammatory mediator prevention and neuromuscular blocking agent management are crucial in preventing residual muscle weakness and prolonged ventilation. Results also indicate that AFM patients would benefit from rapid sequence induction, early preoxygenation, lung protective ventilation (LPV), lung recruitment maneuvers (LRMs), avoidance of depolarizing muscle relaxants (DNRs), reversal with Sucambedex, awake extubation, and postoperative admittance to the ICU. A QI educational presentation was used to present these findings. After the presentation, there was a significant improvement in participants' understanding of AFM anesthetic management as indicated by a pretest M=38, posttest M=93.33, and a t-value of 8.869 with a p-value < 0.00001 at a significance of p < 0.05.

Conclusions: While the findings of this research provide foundational knowledge and strategies for the anesthetic management of AFM patients, more studies must be completed on the population to fully understand the applicability and effectiveness of these findings.

METHODS

- IRR
  - The PRISMA Reporting Items for Systematic Reviews and Meta-Analyses Guideline was utilized
  - Total # of articles selected: 16
  - Databases: EBSCO, Academic OneFile, MEDLINE (Ovid), Google Scholar, Science Direct, and PubMed
  - Search Range: < 6 years old with a date range parameter of 2014-2020
  - Population: variety (due to AFM research being scarce)
  - Disease Understanding:
    - Highly reliable sources and credible health agencies or organizations (e.g., Centers for Disease Control and Prevention)
    - Peer-reviewed meta-analyses, literature reviews, randomized control trials, and non-randomized studies

- QI Project
  - Design: pretest posttest
  - Participation: anonymous
  - Total participants: 16
  - Withdrawn participants: 1
  - Analysis participants: 15
  - Education Method: electronic presentation
  - Data Analyses: paired-samples t-test

CLINICAL PRACTICE RELEVANCE

- There is currently an inadequacy in anesthesia providers' knowledge of AFM that can be improved by research and education
- Pretest
  - M = 38
  - SD = 23.3605
- Posttest
  - M = 93.33
  - SD = 10.4654
- Comparison
  - Diff-M = 55.33 with a Sq. Dev. = 8,173.3

The strategies identified in this IRR can be used to improve outcomes in AFM patients until further studies can be completed for further specificity. An electronic educational presentation would be an effective way of educating anesthesia providers about AFM and these strategies so integration into practice can occur.