Implementation of Education and Bio-Occlusive Ocular Dressings in Robotic Hysterectomy Procedures for Corneal Abrasion Prevention

Miranda Connolly, BSN, RN, SRNA
Cedar Crest College School of Nursing, Allentown, PA

Background

- Corneal abrasions (CAs) have been found to be the most common injury occurring after general anesthesia (Nagelhout & Elisha, 2018; Anesthesia Quality Institute, 2017).
- Corneal abrasions are an adverse patient safety event that contributes to patient discomfort and pain, prolonged length of stay, increased cost of care, and increased risk of long-term visual disturbances (Dixon et al., 2019).
- The risk of CAs increases based on several factors including type of surgery (operations on the head and neck, robotic surgeries), patient position (lateral, prone, steep Trendelenburg), age, race, length of surgical procedure (>90minutes), amount of fluids administered (>2 liters), supplemental oxygen en route to or in the post-anesthesia care unit and inconsistent methods of taping the eyes (Dixon et al., 2019; Fang, 2017; Sampat et al., 2015; Lamberg, 2017).
- Of concern, the risk of CAs during laparoscopic hysterectomies increases nearly 4-fold, and this risk increases to 6.5-fold during robotic hysterectomies (Sampat et al., 2015).
- Research has demonstrated that there are superior protection methods of securing the eyes closed and preventing CAs amongst patients undergoing robotic surgeries with bio-occlusive dressings rather than eye tape alone. (Tourinho-Barbosa et al., 2018; Kan, Brown, & Gainsburg, 2015).
- EBP recommendations include taping the eyelids after induction, utilization of bio-occlusive dressings (tegaderm) for ocular securement during robotic hysterectomy procedures and developing educational initiatives to increase anesthesia providers knowledge on CA risk factors (Tourinho-Barbosa et al., 2018; Kan, Brown, & Gainsburg, 2015; Grixti et al., 2013).

PICO

Amongst anesthesia providers, does the implementation of education and utilization of bio-occlusive dressings in robotic hysterectomy procedures demonstrate a change from a variety of eye protection methods to a single evidence-driven method?

Objectives

1. To improve anesthesia providers knowledge on corneal abrasion prevention through a PowerPoint educational intervention
2. Create a practice change from a variety of eye lid taping methods to a single evidence driven method based on EBP recommendations
3. Reduce the incidence of corneal abrasions amongst patients undergoing robotic hysterectomies

Methodology

- Needs assessment and collaboration conducted with institutional anesthesia stakeholders, coordinators, and department leaders
- Literature search conducted through: CINAHL, PubMED, EBSCOhost, and Google Scholar
- Search terms used: corneal abrasion, robotic surgery, and corneal abrasion prevention
- Advanced search settings: linked full text, published date 2015 to 2021, peer reviewed, and English language.
- Search yielded 5,392 articles
- 10 research articles selected based on their relevancy to answering the PICO question
- Examined current ocular securement methods by anesthesia providers via retrospective chart audits
- The Iowa Model of EBP, a dissemination and implementation model, was selected to guide this project
- Educational module: corneal abrasion prevention PowerPoint with emphasis on current best practices
- Pre-test/post-test survey design to compare providers knowledge
  - Pre-test 17-item: 17 knowledge-based questions
  - Post-test 20-item: 17 knowledge-based, 1 willingness to change practice, 1 open-ended, and 1 benefit of education question
- Implemented over 1-month from October 3rd, 2021, to November 3rd, 2021, to permit adequate time to complete module and surveys
- A convenience sample of 60 anesthesia providers were invited via email to participate

Results

- There was an overall response rate of 33% (n=20) who volunteered to participate. The final response rate for the pre-test was 90% (n=18) and the final response rate for the post-test was 94% (n=17)
- A 95% confidence level (α= 0.05) was selected to evaluate the significance of the results
- The pre-test mean was 72.67% (n=18) and the post-test mean was 89.76% (n=17). The p value of the unpaired t-test was <0.0001 indicating that there was a statistically significant difference between the pre-test and post-test results
- The Chi-square test of independence was performed for the pre- and post- implementation retrospective chart audit data
- The Chi-square results were $\chi 2 = 3.06$ (p-value = 0.08) indicating that the implemented intervention did not affect tegaderm use result and is not statistically significant at a 95% confidence level
- **Clinical Significance**: Compared to the previous 13 corneal abrasions that occurred in robotic hysterectomies from the calendar years 2019 and 2020, there has been a 92% reduction in CAs and compared to the cumulative 17 corneal abrasions that occurred from the calendar years 2019 and 2020, there has been a 76% reduction in CAs overall

Recommendations for Practice

- Based on the statistically significant results of this project, recommendations for practice include implementation of EBP education to improve anesthesia provider knowledge and willingness to change practice for corneal abrasion prevention.
- Current literature supports the utilization of bio-occlusive dressings to prevent corneal abrasions in robotic hysterectomy procedures. It is unclear if the increased utilization of tegaderms contributed to a reduction in corneal abrasions or if an increased awareness/knowledge did, or both. For this reason, additional research is recommended.

Conclusion

- A 17% increase in average test scores after reviewing the educational module infers that participants knowledge increased related to corneal abrasion prevention
- When anesthesia providers are provided with evidence-based recommendations, providers are willing to change practice
- Increased knowledge based on the educational module and utilization of bio-occlusive dressings can lead to a reduction in corneal abrasions as evident by no CAs since project implementation
- Limitations include small sample size, lack of generalizability, research design, and validity of data collection tool

References