

Southern Illinois University Edwardsville

SPARK

Doctor of Nursing Practice Projects

School of Nursing

Spring 5-5-2023

Management of Ineffective Epidural for Cesarean Section

MIRIAM NDENECHO

Follow this and additional works at: <https://spark.siu.edu/dnpprojects>



Part of the [Anesthesiology Commons](#)

Recommended Citation

NDENECHO, MIRIAM, "Management of Ineffective Epidural for Cesarean Section" (2023). *Doctor of Nursing Practice Projects*. 290.

<https://spark.siu.edu/dnpprojects/290>

This DNP Project is brought to you for free and open access by the School of Nursing at SPARK. It has been accepted for inclusion in Doctor of Nursing Practice Projects by an authorized administrator of SPARK. For more information, please contact magrase@siue.edu.

Executive Summary

Introduction of the Problem

Neuraxial anesthesia is the most used anesthesia technique in obstetric anesthesia in the United States (Carvalho, 2012). Epidural anesthesia is used for approximately 29-44% of cesarean sections (Carvalho, 2012). Most women who undergo urgent or emergent cesarean sections have an existing epidural catheter in situ for labor analgesia. A failed epidural top-up during labor for cesarean delivery has proven to be a potentially dangerous clinical complication that requires the provider to change the anesthetic approach to achieve operative anesthesia conditions (Carvalho, 2012). The possibility of a high block is the primary concern with a single-shot spinal after a failed epidural top-up, with an incidence as high as 11% (Carvalho, 2012). As a result, using a spinal in these circumstances has remained debatable because of the risk of a high or total spinal.

A Level 3 perinatal center in central Illinois lacked a protocol for effectively managing failed epidurals going to cesarean section. This project focused on developing an evidence-based protocol for managing ineffective epidurals for cesarean section. The project also answered questions about whether an epidural should be replaced or a spinal anesthetic used after a failed epidural. The literature review also determined the appropriate spinal dose if a spinal was performed following an ineffective labor epidural.

Literature Review

The literature review focused on evidence-based guidelines and educational tools for managing failed epidurals for cesarean section. Unfortunately, the literature provided no practice guidelines for the management of failed epidurals for cesarean section. When a labor epidural was used for an unanticipated cesarean section, the typical approach was to top-up the epidural

catheter (Depuydt & Van de Velde, 2013). Early recognition of inadequate labor epidural analgesia allows anesthesia providers to manipulate or replace the epidural catheter (Desai et al., 2019). Identifying a faulty epidural block during labor is vital for anesthesia providers to make safe interventions promptly to avoid complications during emergencies.

Desai et al. (2019) discussed factors influencing whether anesthesia providers would top up an existing labor epidural for a cesarean section. The main factors identified were the effectiveness of the epidural for labor pain, the urgency of cesarean section, and the dermatomal level of the block. During non-emergency circumstances, if the epidural catheter adjustment or top-up dosing did not result in significant block improvement, replacing the epidural catheter was a safe and appropriate intervention (Bauer et al., 2012). Anesthesia providers typically perform a spinal with a standard local anesthetic (LA) dose if the epidural dose did not establish any block and 30 min had elapsed since the last epidural top-up (Einhorn & Habib, 2016).

After a failed epidural, a single-shot spinal anesthetic can cause rapid onset of surgical anesthesia with the possibility of a high or total spinal, which may be avoided by decreasing the LA dose by 20% to 30% (Yoon et al., 2017). A CSE is another safe option for managing a failed epidural for cesarean section. The epidural component of the CSE should be titrated until the desired block level is achieved (Desai et al., 2019).

In the case of an emergency cesarean section where an appropriate sensory block level is not appropriate for surgical conditions, the anesthesia provider often supplements with psychological support, inhalation agents, or intravenous medications (Desai et al., 2019). The obstetrician also may use local anesthetic infiltration to maintain surgical conditions. General anesthesia is always an option if the parturient continues to be in extreme pain or if there is evidence of fetal distress (Desai et al., 2019).

Project Methods

This project aimed to provide evidence-based recommendations for effectively managing failed epidurals going to cesarean section. The anesthesia providers were educated via PowerPoint presentation about the possible causes and management of failed epidurals. The presentation was approximately 20 min long and consisted of key findings from the literature review. A post-test survey comprised of 13 questions was used to determine the effectiveness of the presentation. The survey included two demographic, eight knowledge-based, and three Likert scale questions. Southern Illinois University at Edwardsville's IRB determined the project was quality improvement and deemed it exempt.

Evaluation

This project aimed to develop an evidenced-based protocol for the management of failed epidural to cesarean section to improve outcomes and decrease provider variance. Unfortunately, the literature review revealed no clear evidence regarding this topic for pilot protocol development. These findings were presented to the anesthesia providers in attendance. Analysis of the post-survey implied that the presentation did have a positive effect. The results of the eight knowledge questions suggested the educational presentation was effective. About 50% of the participants understood the most critical factor influencing the decision to top up an existing labor epidural for a cesarean section was the effectiveness of the epidural for labor analgesia. All nine participants understood that interventions to supplement an ineffective epidural were intravenous agents, psychological support, and nitrous oxide. The most common alternatives for an ineffective epidural for cesarean section were placing a spinal (55.6%) or resiting the epidural (33.3%). Following an ineffective epidural, 11.1% of the participants answered they would administer a full spinal dose, while 44.4% decreased the spinal dose by 20-30%, and another

44.4 % decreased the spinal dose by 50%. Eighty-eight percent of the participants understood that the probability of a high and total spinal block was as high as approximately 11% compared to less than 1% in parturients after a single shot spinal.

All of the participants understood the increased risk of high or total spinal after a failed epidural top-up was a result of preexisting subclinical analgesia from prior exposure of the neuronal tissue to local anesthetic solution from the epidural space. Also, compression of the dural sac by leftover local anesthetic in the epidural space or leakage of local anesthetic into the subarachnoid space through the puncture hole in the dura increased the risk of a high or total spinal. After 120, 60, and 90 min following an epidural top-off dose, 44.4%, 22.2%, and 22.2% of participants, respectively, reported they would administer a total intrathecal dose of local anesthetic without risk of high spinal. Lastly, when participants encountered a questionable epidural going to cesarean section, 33.3% stated they would discontinue or resite the epidural, while 67% would discontinue the epidural and perform a spinal.

A major limitation of this project was the lack of research providing evidence to generate practice guidelines for managing an ineffective epidural for cesarean section. Other limitations to this project were time constraints and participant availability. In addition, the survey results were not generalizable to a larger population because only nine participants completed the post-test following the educational presentation. The sample size might have been larger if implementation had been done during a monthly anesthesia department meeting or at multiple times.

Impact on Practice

The immediate impact of implementation at the host site was the participants experienced increased knowledge surrounding the presentation topics. Even though the literature review did

not provide sufficient evidence on the management of ineffective epidurals for cesarean section to create a protocol, the post-test results revealed a positive learning outcome with improved staff knowledge on managing ineffective epidurals for cesarean section. Sixty-six percent of the participants strongly agreed that the presentation improved their ability to make evidence-based decisions regarding the management of ineffective labor epidural that goes to cesarean section. The predicted long-term impact of this project would be improved patient outcomes. A suggestion for a future project topic is the management of high or total spinal in the obstetrical population after failed epidural top up.

Conclusions

This DNP project provided education on managing failed epidurals for cesarean section. The literature review failed to provide enough evidence to create a standardized evidenced-based guideline for managing a parturient with an ineffective epidural requiring a cesarean section. Most anesthesia providers in attendance would discontinue the epidural and perform a spinal when encountering a questionable epidural going to cesarean section. Following an ineffective epidural, most participants would decrease the spinal dose by 20-30%, while others would decrease the spinal dose by 50%. Providers stated that the appropriate spinal dose following epidural removal depended on the level of the block obtained with the ineffective epidural.

Author Contact Information

Miriam Ndenecho miriam.ndenecho@yahoo.com