Cannabis Physiological Effects and Anesthetic Implications

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PROBLEM INTRODUCTION

Currently, 37 states have legalized cannabis for medicinal use prescribed by qualified medical professionals (National Conference of State Legislatures [NCSL], 2022). In 2012, the legalization of recreational cannabis began; as of 2022, 19 states have legalized the recreational use of marijuana (NCSL, 2022). The popularity of marijuana has drastically increased over the last ten years; therefore, the medical industry must take steps to ensure a proper understanding of marijuana and its impacts on anesthesia.

LITERATURE REVIEW

1. **Pharmacodynamics and pharmacokinetics of cannabis**
   - CB1 receptors are in the central nervous system, cardiovascular system, skin, liver, adipose tissue, and skeletal muscle. CB2 receptors are in the peripheral tissues, gastrointestinal tract, leukocytes, and immune cells
   - THC and CBD are exogenous cannabinoids that work as partial agonists on CB1R and CB2R
2. **How cannabis affects various body systems:**
   - Cardiovascular, pulmonary system, central nervous system, gastrointestinal, and pain pathways
3. **Special populations:**
   - Geriatric, youth, and obstetrics
4. **Anesthesia implications:**
   - Understanding the physiological effects of cannabis how it interacts with commonly administered anesthetics is critical to provide safe anesthetics to cannabis users
5. **The process of interviewing cannabis users**
   - There is a negative cogitation with the term 'illicit drug use'; this terminology on an intake form may cause a patient to be untruthful when disclosing their health history
   - A non-judgmental, empathetic approach should be used when interviewing patients about cannabis use to establish a trusting rapport

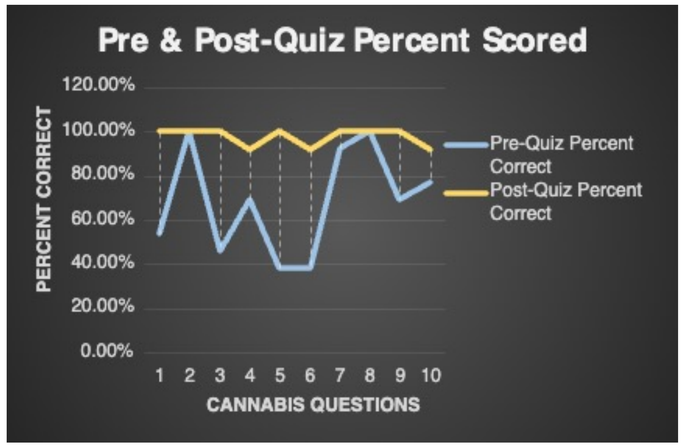
PROJECT METHODS

- Pretest was provided to participants to assess baseline knowledge about cannabis
- An evidence-based PowerPoint lecture was developed as a non-experimental design to increase anesthesia providers' knowledge about cannabis and its implications on anesthesia
- Evidence-based research regarding the physiological effects of cannabis and anesthesia implications of cannabis, discussed in the literature review, was included in this PowerPoint lecture.
- Following the PowerPoint presentation, all participants were asked to complete a short survey assessing their knowledge gained
- The results from the survey were evaluated to determine the success of project implementation

EVALUATION

Survey results indicated that:

1) CRNA's had a lack of knowledge about cannabis
2) Education can improve CRNA knowledge about cannabis
3) Education on cannabis could lead to improve anesthetic care for cannabis users



IMPACT ON PRACTICE

- The results from the pre and post-quizzes showed that this QI project did improve anesthesia providers' knowledge about cannabis
- Identified many CRNA's do not have formal education about cannabis
- With the legalization of cannabis across the U.S., it is imperative anesthesia providers have foundational knowledge about cannabis and how it impacts anesthesia
- This Q.I. project successfully improved the knowledge of twelve CRNAs about cannabis
- With the quickly growing use of cannabis across the U.S., this knowledge should be incorporated into continued education models across America to improve anesthesia provider knowledge about cannabis on a larger scale

CONCLUSIONS

- Due to the increase in cannabis consumption in the U.S., medical professionals need to understand the physiological effects of cannabis
- This QI project lends evidence that anesthesia providers need further education about cannabis
- The results from this QI demonstrated that implementing education for anesthesia providers can improve knowledge about cannabis
- One can hypothesize that improving practicing anesthesia providers' knowledge about cannabis will lead to higher quality care for patients who consume cannabis

References

Alumni Mentorship Program

Nicole Brainin, BSN, SRNA
Southern Illinois University Edwardsville

Scan for References

PROBLEM INTRODUCTION

Many graduate NAP lack alumni involvement in mentorship programs, which could provide many benefits to current students

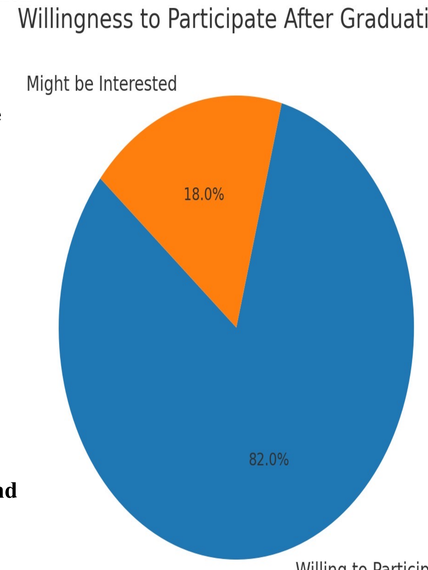
Successful mentorship strategies in nurse anesthesia programs can help current students

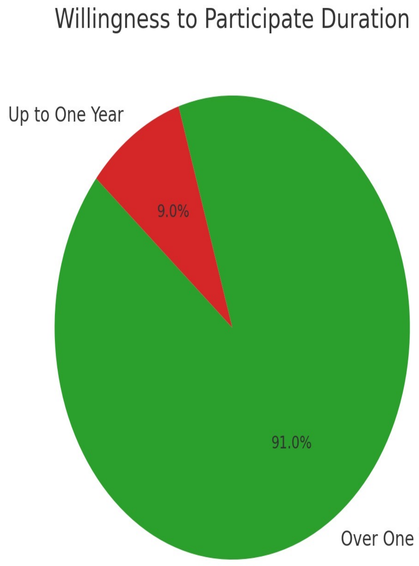
- **develop skills**
- **adequately manage time**
- **and increase overall satisfaction with their learning experience (Manuel & Porsattar, 2021).**

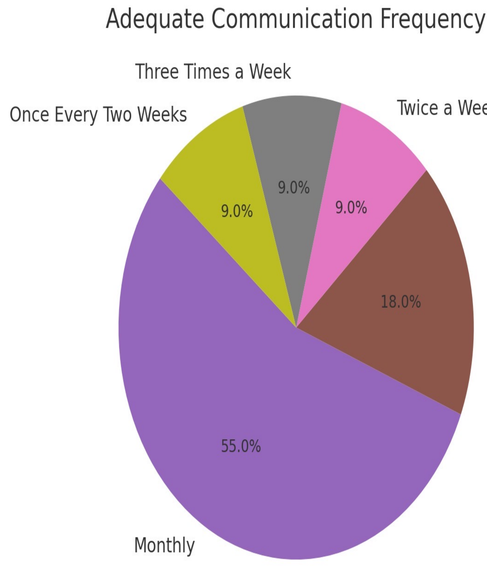
Utilizing alums can

- **increase student career success and**
- **give them insight into how to best approach studying for board exams and**
- **Help navigate their career after graduation**
- **And provide personal satisfaction for the mentors involved (Dollinger et al., 2019).**

PROJECT METHODS







- **Initial recruitment survey sent in May 2023, Participants were added to social media platform in September of 2023 and were available for students**
- **Facebook was used as primary means of communication for alumni and students**

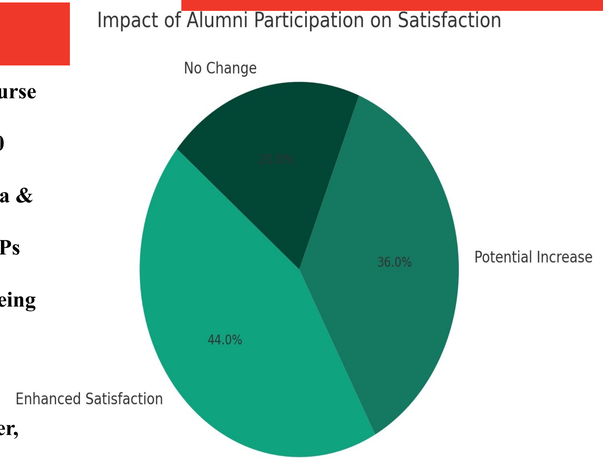
IMPACT ON PRACTICE

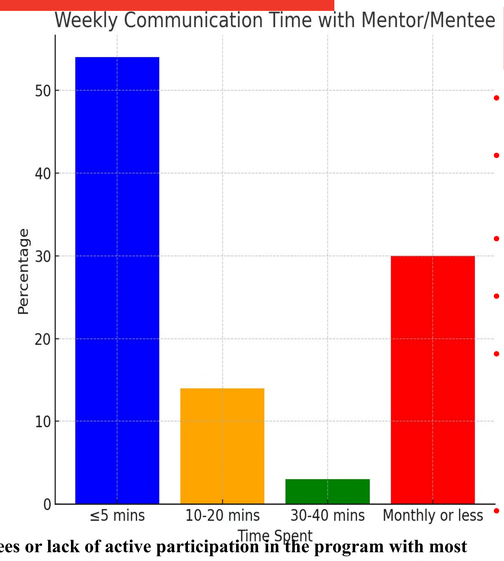
- **Incorporating alumni into Nurse Anesthesia graduate mentorship programs through a well-structured framework, regular, mandated interactions and diverse communication channels, can enhance the educational experience for current students.**
- **This integration fosters increased confidence and satisfaction by facilitating access to mentors with firsthand knowledge of the program's rigors.**
- **Furthermore, it allows alumni to sustain engagement with their alma mater, nurturing a sense of belonging within the academic community. By guiding current students, alumni can effectively complement the efforts of the institution's faculty, thereby enriching the support system available to students. By sharing their unique insights and experiences, alumni mentors offer invaluable contributions to the mentorship program, potentially elevating student contentment and mitigating the stresses associated with intensive academic programs.**

LITERATURE REVIEW

- **SRNAs face significant challenges due to the demanding nature of Nurse Anesthesia Programs (NAPs)**
- **Programs require a minimum of 2000 clinical hours compared to 500 clinical hours of traditional nursing programs.**
- **Additional familial and financial obligations (Morstatt, 2020; Mesisca & Mainwaring, 2021).**
- **Transitioning from experienced ICU nurses to novice learners in NAPs (Mesisca & Mainwaring, 2021; Rivera & Conner, 2019).**
- **Mentorship within NAPs reduces stress and enhances student well-being**
- **Peer-to-peer mentoring is proposed as an effective strategy, though research on integrating alumni into these programs remains scarce (Dollinger et al., 2019; Morstatt, 2020).**
- **Peer-to-peer and alumni mentorship programs provide support and guidance through shared experiences and networks (Rivera & Conner, 2019; Chan, 2022).**
- **Alumni mentorship benefits all parties involved—mentees, mentors, and the university—by fostering connections and satisfying the mentees' needs (Dollinger et al., 2019; Morstatt, 2020).**
- **While the efficacy of mentorship programs in reducing stress and burnout in SRNAs is acknowledged, the potential of alumni involvement after graduation is a promising avenue that warrants further exploration (Dollinger et al., 2019).**

EVALUATION





- **Figures point to gap in connection between mentors and mentees or lack of active participation in the program with most participants reporting alumni participation enhanced satisfaction or has the potential to increase satisfaction with the NAP Mentorship Program**
- **A secondary survey found that recent graduates did not participate in the program**
- **Participants suggested that there should be more diverse communication methods to increase participation and a desire for a more structured program with directed communication requirements**

CONCLUSIONS

- **Incorporating alumni into NAP mentorship programs holds substantial promise for enhancing the educational experience of SRNAs.**
- **Despite the implementation challenges alumni mentorship offers multifaceted benefits, including psychosocial support, career guidance, and a network of professionals with a common background.**
- **Present study indicates that alumni mentorship can lead to increased satisfaction among SRNAs**
- **Full potential of these programs is not yet realized due to low alumni participation and infrequent communication.**
- **Programs should consider**
  - **adopting diverse communication methods**
  - **structured interactions,**
  - **proactive alumni outreach,**
  - **mandatory interaction schedules.**
- **Such enhancements can strengthen the support system for SRNAs, reduce stress, and improve overall program satisfaction. The impact on practice is clear: a well-structured alumni mentorship program can enrich the SRNA educational journey, providing a robust and multifaceted support network crucial for navigating the rigorous demands of NAPs.**

Educating SRNAs on Barriers and Facilitators of Clinical Learning

Mesud Dedic, BSN, SRNA & Rick Heuermann, MBA, BSN, SRNA
Southern Illinois University Edwardsville

PROBLEM INTRODUCTION

A positive clinical experience for student registered nurse anesthetists (SRNAs) may be hindered by inconsistent preceptorship, an unfriendly clinical environment, poor self-assessment, and ineffective feedback interactions (Clancy & Bruinius, 2022; Algiraigri, 2014).

A pre-clinical educational session focusing on communication skills may alleviate stress in complex clinical scenarios and enhance feedback reception (McGinness et al., 2020). Clancy and Bruinius (2022) recommend pre-clinical education for SRNAs to prepare them for preceptor interaction and overcoming barriers to SRNA success.

LITERATURE REVIEW

Barriers to clinical learning:

- Lateral violence
- Inconsistency with preceptors
- Lack of learning opportunities
- Ineffective feedback
- Inadequate self-assessment
- Hierarchical environment
- Stress & anxiety

Facilitators to clinical learning:

- Rapport with preceptors
- Establishing goals
- Beginning of day discussions
- Effective feedback
- Objective feedback evaluation
- Virtual simulation technology

PROJECT METHODS

Develop an educational intervention for second year SRNAs to enhance clinical success by removing evidence-based barriers and exercising evidence-based facilitators

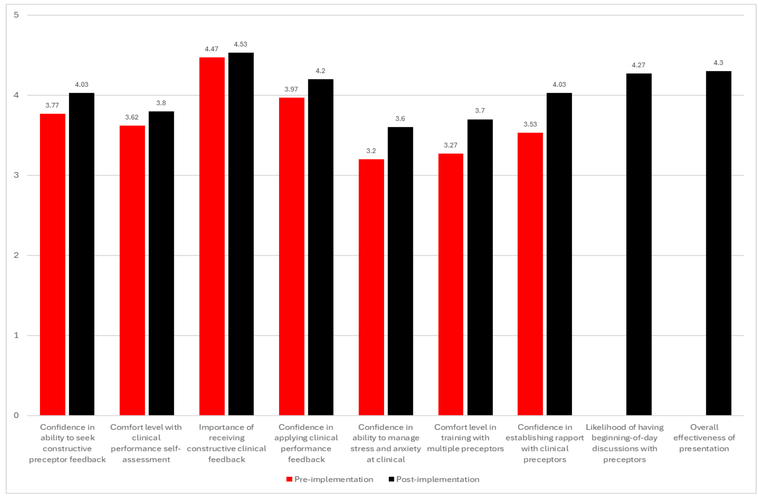
Develop an educational resource for SIUE's clinical and wellness program

Create an educational PowerPoint presentation that emphasizes evidence-based barriers and facilitators of SRNA clinical success coupled with pre-implementation and post-implementation surveys

Analyze survey results to determine presentation effectiveness and opportunities for improvement

Introduction of virtual simulation technology (Mursion) as a tool for future expansion on the DNP project

EVALUATION

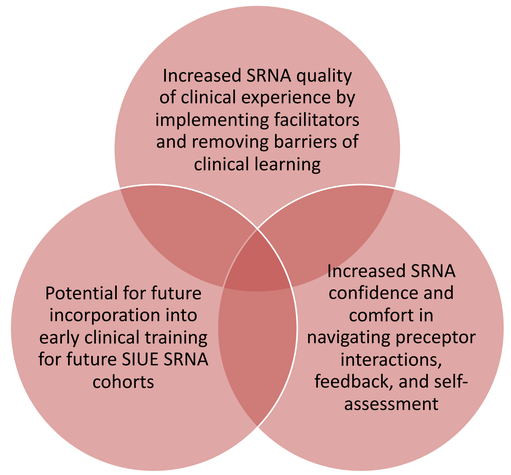


LIMITATIONS

Narrow convenience sample of students (n=30) from primary researchers' nurse anesthesia program

Implementation was conducted 6 months into the sample's clinical training, as opposed to earlier in the program.

IMPACT ON PRACTICE



CONCLUSIONS

Early clinical training focused on barriers and facilitators of SRNA clinical learning may improve clinical success.

Open-ended data collection from surveys suggests earlier implementation may increase success of project goals.

Simulation-based educational intervention may be a beneficial strategy to facilitate clinical learning.

REFERENCE LIST

Shivering in Postpartum Women:
Development of a Perioperative Protocol for Women Undergoing Cesarean Section

Lindsay Dawson, BSN, SRNA & Kara Peters, BSN, SRNA
Southern Illinois University Edwardsville

PROBLEM INTRODUCTION

- In 2021, 1,175,545 births occurred via cesarean section in the United States and of those births, 41,203 of the cesarean sections were in Illinois
- Spinal anesthesia is the most employed anesthetic technique for cesarean sections due to the dense and rapid onset of neuraxial blockade
- Post-partum shivering is a complication neuraxial anesthesia carries with an overall estimated incidence ranging from 40-80% following a spinal anesthetic
- Postpartum shivering can be mild to debilitating and have detrimental physical and emotional effects on the mother and newborn
- The treatment for postoperative shivering has yet to be standardized due to a lack of knowledge about the underlying pathophysiology as well as multiple theories at play
- The development of a perioperative protocol targeting preventative and corrective treatment strategies was initiated to improve patient outcomes and standardize obstetric patient care

PROJECT METHODS

1. Meeting with team leader and an external stakeholder at a tertiary regional medical center in central Illinois
2. Proposal of project and objectives to stakeholder
3. Review of current evidenced- based literature
4. Creating a facility specific perioperative shivering algorithm
5. Apply for IRB
6. Educate obstetric staff on post-partum shivering and preventative and treatment modalities available
7. Evaluation of project via pre and post surveys filled out by the obstetric staff

IMPACT ON PRACTICE

- A pathway of preventative techniques
- Optimizes the perioperative experience for obstetric patients and their newborn
- **Shivering Protocol**
- Creates a clear and concise algorithm for symptom management
- Treatment options if post-partum shivering occurs after a cesarean section

LITERATURE REVIEW

Databases / Subjects / Timeframe
- EBSCO, PubMed, MEDLINE, CINAHL, and Cochrane Database of Systematic Reviews were all searched
- Subjects included obstetric women undergoing cesarean section utilizing spinal anesthesia
- Articles published within the last ten years with a focus on articles published between 2017-2022

Pathophysiology
- The three main theories of shivering are: perioperative hypothermia, neurohormonal response to delivery, and medications administered in the perioperative setting
- Two types of shivering exist: thermoregulatory (cutaneous vasoconstriction) and non-thermoregulatory (cutaneous vasodilation and pain)

Non-Pharmacological Modalities
- Warmed intravenous fluids and and forced-air warming yield the best efficacy
- Other modalities: cotton blankets, radiant heating
- Apply measures in preoperative setting and continue into the post-operative setting

Pharmacological Modalities
- Prophylactic phenylephrine (25-100 mcg/min), 8 mg IVP ondansetron before spinal, and 5 mcg intrathecal dexmedetomidine all have been shown to reduce shivering
- Meperidine should be used as a rescue treatment for post partum shivering as it has various side effects that are best to avoid

EVALUATION

- Twenty-two obstetric nurses and seven nurse anesthesiologists participated in the educational presentation
- The years of experience ranged from 0-20 years
- The pre and post surveys evaluated obstetric nurses and anesthesia providers' knowledge on the pathophysiology of shivering, non-pharmacological interventions, and pharmacological interventions
- The surveys consisted of demographic information, multiple choice, select all that apply, true or false, and fill in the blank questions
- Overall, participants improved their rates of correct responses from the pre-education survey compared to the post-education survey
- According to the analysis of survey responses, the educational PowerPoint presentation was an effective teaching instrument use to improve provider knowledge on caring for post partum women undergoing a cesarean section

CONCLUSIONS

- An evidenced- based protocol creates a standardized approach to parturients who are at risk for post-partum shivering after a cesarean section
- Multimodal therapy is best to prevent and treat shivering in the parturient
- The inclusion of this protocol can have a significant positive impact on patient outcomes, satisfaction rates, and overall care in the obstetric department at this facility

Shivering Protocol & References

Shivering Protocol

Final Reference List

Application of Ultrasound for Difficult Vascular Access in Obstetric Patients

Carly McCleland, BSN, SRNA
Southern Illinois University Edwardsville

PROBLEM INTRODUCTION

Vascular access in OB patients is of utmost necessity

- OB patients are at increased risk of complications such as postpartum hemorrhage, placental abnormalities leading to hemorrhage, hypotension, and hemorrhagic shock
- Vascular access is necessary for IV medications, replacing blood losses with IV fluids, proteins or fluid expanders, and blood or blood product administration

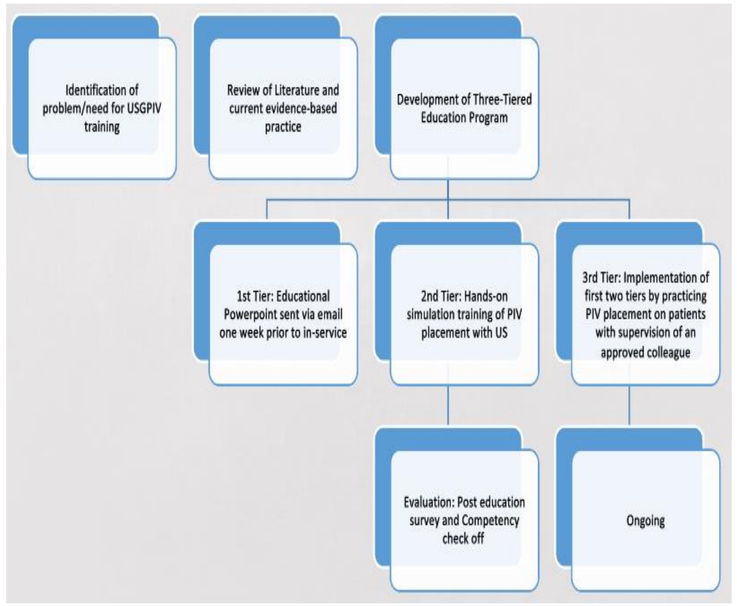
Obtaining vascular access in OB patients can be particularly difficult

- Related to the physiology of pregnancy, resulting in increased edema, obesity during pregnancy, and the pathophysiology of common disease states of pregnancy

Need for development and implementation of educational program for healthcare providers to utilize US when obtaining vascular access in OB

- 71% increase in first-attempt success in OB patients when using US for vascular access placement
- Decrease needle sticks and costs while improving patient satisfaction and speed of care

PROJECT METHODS



IMPACT ON PRACTICE

01

Incorporation of US use into current techniques for PIV placement

02

These newly acquired abilities will lead to cost reduction in supply usage, greater patient satisfaction due to decreased needle sticks and timeliness of care by providers

03

The hope for long term impact is for providers to have first attempt success in PIV placement on patients who are difficult to obtain IV access in by utilizing the US technique.

LITERATURE REVIEW

Databases: Cochrane, CINAHL, EBSCOhost, Google Scholar, Medline, PubMed, Scopus, and ScienceDirect

Search terms: IV access, peripheral IV, obstetrics, ultrasound, ultrasound-guided intravenous access, education, training, e, difficult IV access

Risks and Benefits of Ultrasound-Guided Peripheral IV Access

Three-Tiered Education

Didactic Education

Techniques

Long vs. Short Axis Views

Anatomy and Vessel Selection

Positioning of Clinician

Probes/Transducer Choice

EVALUATION

11 post-education surveys were completed

- Survey results determined that:
  - 54.5% of participants felt confident, and 27.2% felt extremely confident in incorporating US use for PIVs in their normal everyday use
  - 54.5% felt confident and 36.4% felt extremely confident that they could correctly perform the steps of PIV placement via US
  - Answers ranged from neutral to extremely confident, suggesting participants felt as though they could incorporate US use for PIV placement on their unit

11 competency check-offs were completed

- All participants were able to appropriately complete all 19 steps on the first attempt and pass the competency check off

CONCLUSIONS

The implementation of an educational training program for US use during PIV placement has given participants a greater sense of confidence in their ability to incorporate USGPIV placement

The successful completion of the skilled steps of USGPIV placement led participants to increase first-attempt success for PIV placement

There needs to be ongoing assessment of the unit's ability to incorporate US use for PIV placement, such as a post USGPIC placement survey. This is could potentially be a future DNP project topic.

REFERENCES

Creation of an Educational Pamphlet for Patients Receiving Upper Extremity Peripheral Nerve Blocks

Elizabeth Hamlin, BSN, SRNA
Southern Illinois University Edwardsville

PROBLEM INTRODUCTION

- PNB use is increasing in anesthesia as the sole anesthetic or in combination with another anesthetic technique due to their benefits (Thompson, 2018; Panchemia et al., 2021)
- Perioperative RNs are directly involved in PNB procedures, patient care, and patient education and are expected to be knowledgeable in the area (Helander et al., 2019: Wright, 2011)
- Surgery center located in Edwardsville, IL demonstrated need for improved RN and patient education on upper extremity PNB – specifically interscalene and axillary nerve blocks

LITERATURE REVIEW

- PNBs reduce perioperative opioid requirements, decrease length of stay in PACU, decrease central sensitization to pain, improve pain control, increase patient satisfaction, reduce risk of patient complications, and overall improve patient outcomes (Panchamia et al, 2021; Helander et al., 2019).
- Perioperative RNs should be knowledgeable on patient assessment, procedures, adverse effects, complications, treatment of complications, and appropriate patient education techniques (Helander et al., 2019; Wright, 2011).
- RN education should be focused on risks, benefits, procedure detail, and proper discharge teaching (Snow, 2021).
- Patient education should focus on preventing injury, pain management, and events that prompt patients to seek medical attention (Snow, 2021; Thompson, 2018).
- Written education should be at a 4th-6th grade level to increase understanding (Pashkova et al., 2022; Wittenber et al., 2018).

EVALUATION

- Pre-implementation and post-implementation survey included two demographic questions, five knowledge-based questions assessing RN PNB knowledge, and 4 questions assessing effectiveness and buy in of patient education pamphlet
- Nine perioperative RNs participated

Nursing Demographic Characteristics of Sample (n=9)

Characteristics	Respondents N (%)
Length of nursing career	
Less than 5 years	0 (0)
5-15 years	0 (0)
15-25 years	4 (44.44)
25+ years	5 (55.56)
Experience assisting PNB procedures	
Less than a year	1 (11.11)
1-3 years	1 (11.11)
3-5 years	1 (11.11)
5+ years	6 (66.67)

Knowledge Assessment of Sample (n=9)

Statements	Pre-implementation Sample N (%)		Post-implementation Sample N (%)	
	Correct	Incorrect	Correct	Incorrect
What channel do local anesthetics work on?	1 (11.11)	8 (88.89)	7 (77.78)	2 (22.22)
Interscalene block has a lower risk of pneumothorax compared to axillary block.	4 (44.44)	5 (55.56)	3 (33.33)	6 (66.67)
Which has an increased risk of intravascular absorption leading to LAST?	5 (55.56)	4 (44.44)	8 (88.89)	1 (11.11)
Patients should wait to begin to take pain medication until the effect of peripheral nerve block wears off.	9 (100)	0 (0)	8 (88.89)	1 (11.11)
When should the RN aspirate the syringe during a PNB procedure?	6 (66.67)	3 (33.33)	7 (77.78)	2 (22.22)

PROJECT METHODS

- Southern Illinois University Edwardsville IRB and stakeholder board approval obtained
- Quality improvement project created and implemented an educational presentation for perioperative RNs & an education pamphlet on upper extremity PNBs
- Presentation and pamphlet were designed using the most recent literature

IMPACT ON PRACTICE

- Improved perioperative RN knowledge of PNB, appropriate care of patients receiving PNB, and proper patient education
- Pre-implementation test averaged 55.6%; post-implementation test averaged 73.3%
- Access to new patient education tools for PNBs
- Promotion of best practice in perioperative care for patients receiving PNB
- Improved patient knowledge regarding PNB information and postoperative care

CONCLUSIONS

- Educational presentation targeted towards perioperative RNs improve RN knowledge of PNB, patient education, and perioperative care
- RN experience does not exclude a need for proper education on PNBs
- Improved RN and patient education leads to promotion of best practice in perioperative care for patients who receive PNB

ACKNOWLEDGEMENTS

I would like to thank Dr. Whitney Heischmidt, Dr. Lauren Douglass, and Dr. Matthew Bednarchik for their guidance throughout this project.

Best Practice in Airway Management of the Neonatal Population

Brittaney Montcalm, BSN, SRNA
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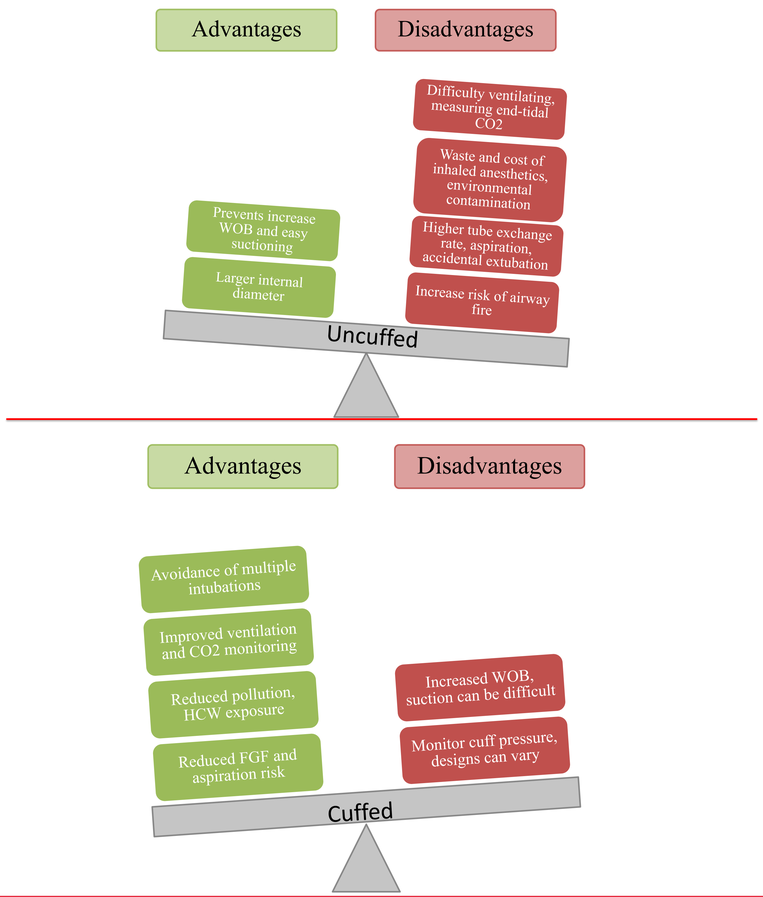
PROBLEM INTRODUCTION

- The neonatal population has the highest incidence of airway injury, resulting in the need for improved endotracheal intubation criteria (Litman & Maxwell, 2013).
- Neonates are at an increased risk for intubation-related injuries due to differences in airway anatomy and physiology (Harless et al., 2014).
- Whether to use a cuffed or uncuffed endotracheal tube (ETT) in the neonatal population remains controversial.
- While uncuffed ETTs have traditionally been the preferred method for intubation in neonates, current research has shown the increasing use of cuffed ETTs.

LITERATURE REVIEW



PROJECT METHODS

Design
- Comprehensive literature review of best-practice recommendations for neonatal airway management, focusing on the use of uncuffed versus cuffed ETTs
- The findings were presented in the form of a PowerPoint presentation and a quick reference guide was created

Goals
- Increase the knowledge of providers with evidence-based recommendations on the preference for uncuffed versus cuffed tubes in the neonatal population.
- Implement a quick reference guide for endotracheal tubes for the pediatric population.

IRB
- Non-experimental study
- Project fell within quality improvement guidelines and deemed exempt by the IRB

Execution
- 12-question post-implementation survey to determine knowledge enhancement and utilization of the handout tool.
- The survey consisted of demographic questions, knowledge-based questions, and Likert-style questions evaluating the hand-out tool itself.

EVALUATION

- 8 anesthesia providers completed the paper survey, 75% were CRNAs with over 10 years of experience.
- Overall knowledge was increased regarding pediatric airway injury and cuffed ETTs in the neonatal population (62.5%)
- All participants responded with an 8 or higher on the Likert scale questions, indicating that the presentation increased their knowledge of the pediatric airway, cuffed versus uncuffed ETTs in the neonatal population, and improved their preparation and ability to determine the best choice of ETTs for the neonatal population.
- All participants felt the handout was appropriate for the operating room and rated it as very user-friendly.

IMPACT ON PRACTICE

- The primary goals of this doctoral project implementation were met. Overall results were positive and indicated buy-in from the anesthesia staff.
- This project increased knowledge regarding pediatric ETT selection among the anesthesia staff at the host site.
- This project can improve patient care among pediatric anesthesia providers and lays the foundation for future projects regarding this important topic.

CONCLUSIONS

- Current research has shown that cuffed ETTs are safe and effective in neonates and children weighing 3 kg or more.
- Additional research in patients weighing less than 3 kg is necessary to provide further recommendations. Studies must include both full-term and low-birth weight neonates and evaluate both short and long-term use of cuffed ETTs.

PEDIATRIC TOOL

Circuit/Bag	
<4 kg	Neonatal circuit, 0.5 L
>4 kg- 4 years	Regular circuit, 1L
5-10 years	Regular circuit, 2L

Laryngoscope Blades	
Premature	Miller 0
Term-2 years	Miller 1
2 years-6 years	Miller 2, Mac 2, Wis-Hipple 1.5

Laryngeal Masks	
Up to 6.5 kg	1.0
6.5 kg-10 kg	1.5
10-20 kg	2.0
20-30 kg	2.5
>30 kg	3.0
Adult	4.0

Oral Airways	
Neonate- 3 mo	50 mm (blue)
3-12 months	60 mm (black)
1-6 years	70 mm (white)
6+ years	80 mm (green)

Endotracheal Tube (Cuff decrease size by ½)	
Premie	≤3 kg uncuffed ETT ≥ 3kg 3.0 cuffed ETT
Term neonate	3.5
1 month-1 year	3.5-4
1-2 years	4-4.5
>2 years	(age in years/4) +4

Face Masks	
Preterm/neonate	Size 1
Infant	Size 2
Toddler	Size 3
Child	Size 4

Vitals			
Age	HR	SBP	RR
Premie	120-180	40-60	55-60
Neonate	100-190	50-70	35-40
6 mo	110-180	60-110	25-30
1-2 yrs	100-160	65-115	20-24
2-3 yrs	90-150	75-125	16-22
3-5 yrs	65-135	80-120	14-20
5-8 yrs	70-115	90-120	12-20
9-12 yrs	55-110	90-120	12-20

Labs			
	Neonate	Infant	Child
Hgb	14-20	11-15	11-13
Hct	46-62	30-49	29-41
Glucose	40-110	60-105	70-110

Estimate Burn Hemorrhage	
Excision	3-5% of EBV for each 1% TBSA excised
Grafting	2% of EBV for each 1% TBSA grafted

Hypoglycemia	
Infant < 40	1-12 ml/kg of D10% slowly
Child <60	2 ml/kg of D25% slowly

Blood Products	
PRBC 10-20 ml/kg	• Maintain Hct >30% in children/infants with cardiac or respiratory diseases • Hct >25% in healthy children/infants
FFP 10-15 ml/kg	• Increase factor levels by 15-20%
PLT 5-10 ml/kg	• Increase PLT count by 50,000/mcL
Cryo 0.1 units/kg	• Increase fibrinogen by 60-100 mg/dL
Albumin 10-20 ml/kg	• 5% patient requires primarily volume • 25% patient requires primarily protein/oncotic pressure • May repeat to max of 6 gram/kg/day ***DO NOT administer >25% of the EBV with albumin**

MABL		EBV (ml/kg)	
EBV(Initial Hct-Lowest Acceptable Hct) / Initial Hct		Premie	90-105
		Term Newborn	80-90
		Infant (< 3 mo)	70-75
		Child (Female)	65
		Child (Male)	70

Antibiotics	
Ampicillin	50 mg/kg
Cefazolin	25-50 mg/kg
Cefotaxime	20-50 mg/kg
Cefoxitin	30-40 mg/kg
Clindamycin	5-10 mg/kg (20 mg/kg for SBE prophylaxis)
Ertapenem	15 mg/kg (3 mo-12 years)
Gentamicin	1.5-2.5 mg/kg
Metronidazole	15 mg/kg
Vancomycin	10 mg/kg

Emergency IV	Atropine	0.01-0.02 mg/kg	**Analgesics**	Ketorolac	**(1-6months):** 0.25 mg/kg ***Expert consultation recommended** **(>6 months):** 0.5 mg/kg (Max 30 mg)
	Glycopyrrolate	0.005-0.01 mg/kg			
	Epinephrine	0.01 mg/kg			
	Succinylcholine	0.25-0.5 mg/kg (IV or SL for laryngospasm)		Fentanyl	**IN/IV:** 1-2 mcg/kg
				Morphine	0.05-0.1 mg/kg
	Calcium Cl	10-20 mg/kg		Hydromorphone	0.01-0.015 mg/kg
	Potassium Cl	0.5 mEq/kg		Remifentanil	**Bolus:** 1-4 mcg/kg
	Sodium Bicarbonate	0.5-1 mEq/kg			**Infusion:** 0.1-0.5 mcg/kg/min
	Intralipids 20%	**Bolus:** 1.5 ml/kg over 1 minute (May repeat x1) **Infusion:** 0.25 ml/kg/min (Not to exceed 5 ml/kg)		Sufentanil	**Bolus:** 0.25-1 mcg/kg **Infusion:** 0.1-1 mcg/kg/hr
				Acetaminophen	**PO:** 10-15 mg/kg **(Offirmev)IV:** (Full term- 1 month) 7.5 mg/kg (1 month-2 years) 10 mg/kg
	Dantrolene	2.5 mg/kg (Up to 10 mg/kg)			
Anxiolytics	Midazolam	**PO:** 0.5-1 mg/kg **IN:** 0.2-0.3 mg/kg **IV:** 0.05-0.1 mg/kg	**Antiemetics**	Metoclopramide	0.1-0.2 mg/kg
				Ondansetron	0.15 mg/kg
				Dexamethasone	0.15-1 mg/kg
	Dexmedetomidine	**IN:** 1-2 mcg/kg **IV Infusion:** 1 mcg/kg (load over 10 min) followed by 0.2-0.7 mcg/kg/hour		Diphenhydramine	0.5-1 mg/kg
			Other	Lidocaine	1 mg/kg
				Furosemide	1-2 mg/kg
				Mannitol	0.25-1 G/kg ***Requires filter for administration**
Induction Agents	Propofol Etomidate Ketamine	2-3 mg/kg 0.3-0.4 mg/kg **IV:** 0.5-2 mg/kg **IM/PO:** 5-10 mg/kg		Solu-medrol	2 mg/kg
				Tranexamic Acid	10 mg/kg over 1 hr Then 1 mg/kg/hr *Stop infusion when closure begins (1000 mg TXA in 100 ml NS)
Muscle Relaxants	Rocuronium	0.6-1.2 mg/kg			
	Cisatracurium	0.1-0.2 mg/kg			
	Succinylcholine	**IV:** 1.5-2 mg/kg **IM:** 2-4 mg/kg	**Local Anesthetics** (Max doses for regional or topical anesthesia only)	Lidocaine	w/o epi: 5mg/kg with epi: 7 mg/kg
Reversal Agents	Sugammadex	2-16 mg/kg			LTA: 2mg/kg
	Neostigmine	0.05-0.07 mg/kg		Bupivacaine	2.5 mg/kg (1 ml/kg of 0.25%) (0.5 ml/kg of 0.5%)
	Flumazenil	0.1 mg/kg (q1min; 1 mg Max)		Ropivacaine	2 mg/kg (1 ml/kg of 0.2%)
	Naloxone	0.001-0.01 mg		Caudal Block Dosing	1 ml/kg of 0.25% Bupivacaine or 0.2% Ropivacaine (with 1:200,000 epi)

Development of High-Fidelity Simulations for SRNAs: Airway Fire and Venous Air Embolism

Ashlyn Russo, BSN, SRNA & Brooke Skaggs, BSN, SRNA
Southern Illinois University Edwardsville

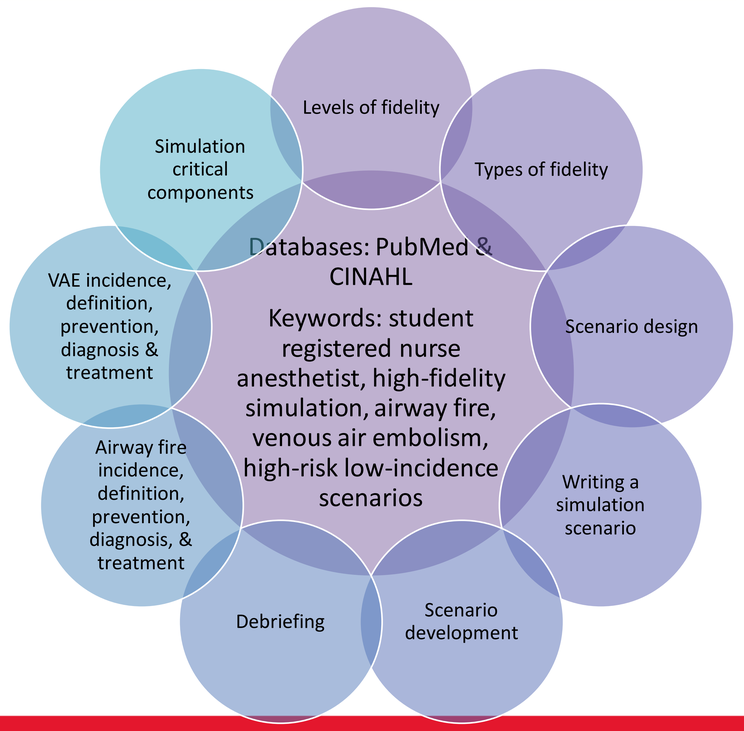
PROBLEM INTRODUCTION

Low-incidence high-risk complications
- Requires swift recognition and treatment in a high-stress environment
- Airway fire and venous air embolism

SRNA Experience
- SRNAs and CRNAs often never experience such complications

High-fidelity simulation
- Mimic high-mortality scenarios in a safe environment

LITERATURE REVIEW



PROJECT METHODS

1. Assessment of stakeholder need
2. Project proposal to stakeholder
3. Review of literature and current evidence-based guidelines
4. Development of simulation
5. Development of critical simulation components & debriefing session
6. Implementation of simulations
7. Project evaluation via anonymous survey

EVALUATION

30 SRNAs participated in the simulation and completed the evaluation survey.

100% answered knowledge-based airway fire questions correctly

97% correctly identified earliest sign of VAE. 57% correctly identified first step in treatment of VAE

Students were asked to score their opinions on the following:
- Critical thinking skills & decision-making
- Diagnosis & management of airway fire & VAE
- Debriefing is constructive & beneficial

The students' mean scores of 9.8, 8.3, & 9.9 respectively, suggested that the simulation was effective overall.

IMPACT ON PRACTICE

- Clinical judgement, knowledge, & performance post simulation
- Increased student satisfaction compared to traditional learning methods
- **High-fidelity simulation**
- Greatest benefit to students with less clinical experience
- Effective teaching strategy for rare, high-mortality emergencies

CONCLUSIONS

- Creating rare simulation scenarios can prepare SRNAs to act quickly in future independent practice
- High-fidelity simulation is the SRNA's preferred method of learning
- High-fidelity simulation has the greatest effect on knowledge outcomes
- Simulation is an effective & safe method to improve students' performance, confidence, and skills

REFERENCES

Anesthetic Management of the Parturient with Increased Intracranial Pressure

Maddie Olson, BSN, SRNA
Southern Illinois University Edwardsville

PROBLEM INTRODUCTION

Pregnancy is associated with physiologic changes that can lead to neurologic changes and impact preexisting neurologic disorders

Patients with preexisting neurologic conditions such as Arnold Chiari Malformation I, pseudotumor cerebri, and mass occupying lesions are at significant risk of increased ICP during pregnancy

Currently, there is a lack of information regarding optimal medical and labor anesthetic management for pregnant patients with increased ICP

A large tertiary care facility in central Illinois reports a lack of a standardized protocol with evidence-based recommendations regarding anesthetic care of the parturient with increased ICP

LITERATURE REVIEW

Arnold Chiari Malformation I

- Defined radiographically as herniated cerebellar tonsils > 5 mm below the level of foramen magnum
- If a patient is asymptomatic, vaginal delivery with spinal or epidural analgesia is considered safe

Pseudotumor cerebri

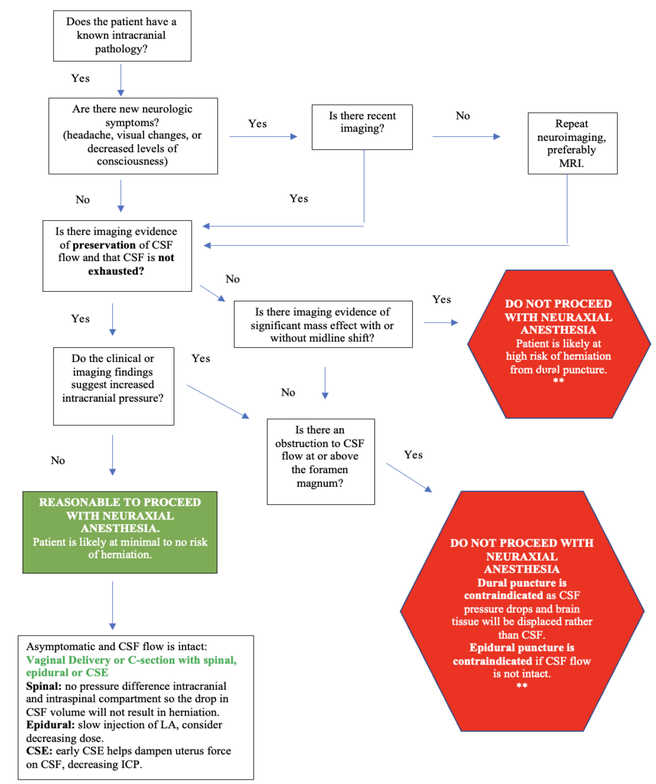
- Intracranial pressure (>20 mmHg) with no known underlying cause
- The ideal anesthetic technique is unknown as epidural, spinal or combined spinal-epidural have all been performed successfully

Mass occupying lesion

- MRI imaging must ensure CSF flow and the absence of pressure differences between the intracranial and intraspinal compartments
- If the lesion does not obstruct flow, an epidural with reduced dose or spinal anesthetic can be used
- If CSF flow is obstructed, a spinal is contraindicated due to the risk of herniation

PROJECT METHODS

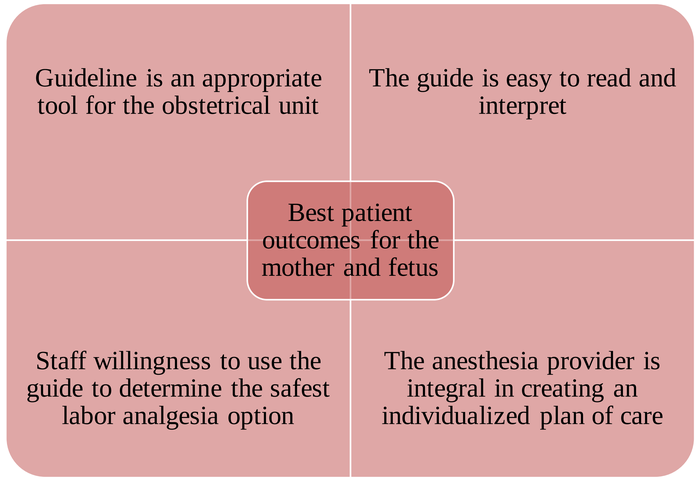
1. Assessment of Stakeholder needs
2. Literature Review
3. Development of quick reference guide
4. Presentation and staff education on the safest labor analgesia options
5. Evaluation of staff willingness to use the quick reference guide



EVALUATION

- Voluntary survey with five Likert-style questions, ranging from strongly agree to strongly disagree
- Questions assessed for improvement in knowledge and staff willingness to use a reference tool
- The survey had a small sample size compromised of obstetric residents, CRNAs and an anesthesiologist

IMPACT ON PRACTICE



CONCLUSIONS

- Neuroimaging, current symptoms, treatment modalities, and labor goals must be reviewed before neuraxial anesthesia
- The anesthetic plan must ensure both maternal and fetal safety
- An evidence-based resource regarding neurological disorders with increased ICP has the potential to ensure best-practice
- This project will better equip the anesthesia team to provide safe care to the mother and fetus while potentially reducing morbidity and mortality in a unique population

SCAN ME

Anesthesia Management for Preeclamptic or Hypertensive Parturient

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PROBLEM INTRODUCTION

- Preeclampsia is a maternal multisystem organ dysfunction caused by an abnormal placenta formation. Maternal hypertension manifests due to a mismatch between maternal blood supply and fetal oxygen demand (Wang et al., 2019).
- Treatment modalities include antihypertensives, magnesium sulfate for seizure prophylaxis, and early delivery of the fetus (ACOG, 2020).
- Neuraxial anesthetic-induced sympathectomy combined with circulating antihypertensives, magnesium sulfate therapy, and intravascular volume depletion can lead to exaggerated hypotension. (ACOG, 2019).
- Persistent refractory hypotension after neuraxial anesthesia in parturients with preeclampsia or hypertension has been an ongoing issue affecting obstetric providers at the host facility

PROJECT METHODS

Meeting with the stakeholder to identify the problem and assess the need of the project → An extensive literature review of the current evidence regarding anesthetic management for the preeclamptic or hypertensive parturient

A communication tool was created to facilitate early communication between the obstetric team and anesthesia providers regarding the timing of antihypertensives and neuraxial anesthesia. → Literature review findings and communication tool presented to the anesthesia department at the host facility

EVALUATION

- Nine anesthesia providers completed the post-implementation survey.
- The majority of providers have been practicing for more than 10 years and indicated awareness of refractory hypotension with neuraxial anesthesia in preeclamptic parturients.
- All the participants (100%) indicated that the communication tool was user-friendly and effective for improved collaboration and communication between the obstetric and anesthesia providers.
- Results showed that the verbal education presentation increased provider knowledge about preeclampsia and improved the providers' ability to recognize diagnostic parameters of preeclampsia.

IMPACT ON PRACTICE

Improved communication between obstetric and anesthesia providers about the timing of antihypertensives for hypertensive or preeclamptic parturients can facilitate decision-making for the anesthetist.

Survey responses demonstrated the educational presentation was informative, and the communication tool was user-friendly and likely to be incorporated into practice.

Project promotes best practice in caring for a unique patient population.

LITERATURE REVIEW

The rate of preeclampsia in the United States increased by 25% from 1987 to 2004 (ACOG, 2020; Kasson, 2018).

Goals for intrapartum management for preeclamptic parturients are prompt control of hypertension, seizure prophylaxis, and expedited fetus delivery.

First-line antihypertensives are labetalol, hydralazine, and nifedipine to keep blood pressure under 140/100 mmHg.

Magnesium sulfate infusion is used for seizure prophylaxis when severe preeclampsia features are present. Magnesium can worsen neuraxial anesthetic induced hypotension.

Hypotension is treated with either phenylephrine or ephedrine. IV crystalloid or colloid co-loading administration is recommended.

PREECLAMPSIA COMMUNICATION TOOL

Induction parturient with known hypertension or preeclampsia with severe features requiring acute treatment with antihypertensives.

Laboring parturient that meets criteria for new diagnosis of preeclampsia during labor course.

C-Section going to OR within 6 hours with worsening hypertension or preeclampsia symptoms requiring acute treatment.

→ Call Anesthesia

CONCLUSIONS

Maternal morbidity and mortality can be reduced by aggressive treatment of hypertensive disorders of pregnancy.

Close communication between the obstetric and anesthesia team is paramount in properly timing neuraxial anesthesia with the current antihypertensive regimen.

Acknowledgements

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