UNIVERSITY OF SASKATCHEWAN

29th ANNUAL RESIDENT RESEARCH DAY

DEPARTMENT OF ANESTHESIOLOGY, PERIOPERATIVE MEDICINE AND PAIN MANAGEMENT

Sunday, April 24, 2016
REGINA, SASKATCHEWAN

29th ANNUAL RESIDENT RESEARCH DAY

DEPARTMENT OF ANESTHESIOLOGY, PERIOPERATIVE MEDICINE AND PAIN MANAGEMENT

GUEST JUDGES

Dr. Theo LeRoux

Dr. Ryan Pikaluk

Dr. Adam van der Merwe

07:45 – 08:45

COMPLIMENTARY BREAKFAST

08:45 – 09:00

OPENING REMARKS

Dr. Jon Gamble, Director of Research

09:00 – 09:45

ORAL PRESENTATIONS – ONGOING PROJECTS

09:45 – 10:45

COFFEE BREAK & POSTER DISPLAYS

10:45 – 11:45

ORAL PRESENTATIONS – COMPLETED PROJECTS

11:45 – 12:00

AWARD PRESENTATIONS

09:00 – 09:45

ORAL PRESENTATIONS – ONGOING PROJECTS

Oral methadone as a preoperative analgesic for patients undergoing sternotomy: a pilot study

Tim Bolton & Sarah Chomicki

General anesthesia for endovascular thrombectomy: a pilot study

Todd McDonald & Peter Hedlin

Clinical utility of thromboelastography in the coagulopathic parturient: a prospective cohort study

Catherine Lacny

09:45 – 10:45

POSTER DISPLAYS AND COFFEE BREAK

Efficacy of opioid-free anesthesia in reducing postoperative respiratory depression in children undergoing tonsillectomy: a pilot study

Jayden Cowan

Outcomes following acute hip fracture: a RCT of preoperative optimal positioning

AJ ElZahabi, Andrew Jun & Patrick Valcke

Ultrasound-guided vs. direct visualization paravertebral block placement in VATS procedures

Stefan Kojic & Fabio Magistris

One year mortality of elderly ICU patients in the Saskatoon Health Region: a retrospective cross-sectional study

Melanie Orvold

Safety and efficacy of tracheal palpation of the sliding endotracheal tube cuff to assess tip location in the trachea: a randomized controlled trial

Christopher Durr (Dean's Summer Student)

10:45 – 11:45

ORAL PRESENTATIONS – COMPLETED PROJECTS

A cross-sectional comparison of OR hat bacteria

Brent Francis

Does single dose dexmedetomidine for procedural sedation reduce post-operative pain in total knee arthoplasty? A randomized control study

Nirupan Vipulananthan

Subcutaneous ketamine for postoperative pain relief

Calen Sacevich

A prospective randomized double blinded control trial using ketamine or propofol for electroconvulsive therapy: improving treatment-resistant depression

Grahme Weisgerber

11:45 – 12:00

AWARD PRESENTATIONS

Best Completed Research Project	$500.00
Best Research Project in Progress	$200.00
Best Study Design	$200.00
Best Presentation	$100.00
Research Poster Competition	$100.00

12:00

LUNCH

Preoperative oral methadone for patients undergoing cardiac surgery: reduction of postoperative pain

Tim Bolton,[1] Sarah Chomicki,[1] William P. McKay,[1] Jeff Betcher,[1] Ryan Pikaluk,[1] John Tsang[2]

[1]Department of Anesthesiology, University of Saskatchewan; [2]Department of Cardiothoracic Surgery, Regina Qu'Appelle Health Region

Introduction

Sternotomy is a painful part of all cardiac surgeries; approximately 30% of patients will develop chronic, non-cardiac pain post-sternotomy, independent of the type of cardiac surgery performed.[1] While uncontrolled acute pain is a predominant risk factor for the development of chronic postoperative pain,[2] a combination of preoperative and multi-modal analgesia is the most effective way to significantly decrease pain.[3] Preoperative IV methadone is effective for reducing postoperative pain as well as postoperative opioid consumption.[1-4] However, no clinical trials have explored the utility of oral methadone as a preoperative analgesic. We hypothesize that preoperative oral methadone can reduce postoperative opioid consumption in patients undergoing sternotomy for cardiac surgery.

Methods

Following research ethics board approval, 40 patients, greater than 18 years of age, who are scheduled for coronary artery bypass graft (CABG) surgery will be randomized to receive either 0.3 mg/kg of oral methadone (to a maximum of 30 mg) or placebo. Standardized anesthetic will be delivered. Postoperatively, patients will be transferred to the ICU with patient-controlled analgesia (PCA) morphine. Patient Controlled Anesthesia (PCA) morphine consumption will be recorded for 72 hours in addition to their Visual Analogue Scale (VAS) pain scores, opioid related side effects, patient perceived pain satisfaction, and a six month follow-up chronic pain assessment.

Results

Recruitment is expected to begin April 11. We anticipate that oral methadone will reduce PCA morphine consumption at all time points. We further expect that VAS scores and opioid related side effect will be reduced, patient satisfaction will improve, and chronic pain will be lower in the methadone group at 6 months.

Conclusion

This study may show that preoperative oral methadone could be used as an effective, low cost, preoperative medication for CABG surgery patients.

References

1. Udelsmann A, Maciel FG, Servian DCM, et al. Rev Bras Anestesiol. 2011;61(6):698-701.
2. Gottschalk A, Durieux ME, Nemergut EC. Anesth Analg. 2011;112(1):218-23.
3. Russell T, Mitchell C, Paech MJ, Pavy T. Int J Obstet Anesth. 2013;22:47-51.
4. Murphy GS, Szokol JW, Avram MJ, et al. Anesthesiology. 2015;122(5):1112-22.

General anesthesia for endovascular thrombectomy: a pilot study

Todd McDonald,[1] Peter Hedlin,[1] Brian Brownbridge,[1] Ayoub Dangor,[1] Gary Hunter,[2] Hyun Lim,[3] Lissa Peeling,[4] Michael Kelly[4]

[1]Dept. of Anesthesiology; [2]Dept. of Medicine; [3]Community Health and Epidemiology; [4]Dept. of Surgery, University of Saskatchewan

Introduction

Standard of care for acute ischemic stroke includes administration of tissue plasminogen activator (tPA) within 3 hours (up to 4.5h in some patients) of stroke onset.[1] New evidence has established that the addition of endovascular thrombectomy for large, and/or proximal occlusions improves outcomes in addition to, and/or in place of tPA therapy.[2] This procedure is routinely performed under either local anesthetic with sedation or under general anesthesia (GA). In the Saskatoon Health Region (SHR), endovascular thrombectomies are performed under GA due to operator preference and the optimization of surgical conditions.

Several retrospective trials have suggested that GAs are associated with poorer outcomes.[3] However, these trials are limited by their retrospective design; patients with more severe strokes may be more likely to receive a GA.

Time to reperfusion is a critical factor related to outcome prediction. It is possible that with the improved surgical conditions that GA provides procedural time may decrease, although the effect on time to reperfusion remains unclear.

There have been no randomized prospective trials assessing the relationship of anesthesia on patient outcomes during endovascular thrombectomy.

Methods

This trial is designed as an open-label pilot study, which will have both prospective and retrospective arms. The GA prospective arm will be conducted at Royal University Hospital and the retrospective data will be obtained from the investigator ESCAPE trial data. The primary endpoint will be the Modified Rankin score at 90 days. A convenience sample consisting of all eligible prospective participants between January 2016 and September 2017 will be compared to historical retrospective data. We anticipate 50 participants in the prospective arm.

Results

Pending.

Discussion

Pending.

References

1. Amaro S, Canovas D, Castellanos M, et al. Int J Stroke. 2010;5(4):325-8.

2. Berkhemer OA, Fransen PSS, Beumer D, et al. N Engl J Med. 2015;372(1):11-20.

3. Abou-Chebl A, Lin R, Hussain MS, et al. Stroke. 2010;41(6):1175-9.

The clinical utility of thromboelastography in the coagulopathic parturient: a prospective cohort study

Catherine Lacny,[1] Kyle Gorman,[1] Darrien Rattray,[2] Mamata Pandey[3]

[1]Department of Anesthesiology, University of Saskatchewan; [2]Department of Obstetrics, Gynecology & Reproductive Sciences, University of Saskatchewan; [3]Research and Performance Support, RQHR

Introduction

Approximately 7% of labouring parturients will present with a platelet count less than 150,000mm^3. Thrombocytopenic parturients requesting or requiring neuraxial analgesia pose a dilemma for anesthesiologists; an epidural hematoma is a rare but catastrophic complication. There are currently no uniformly accepted guidelines regarding the management of these patients. Thromboelastography (TEG) is a laboratory test that measures all phases of coagulation and fibrinolysis. We hypothesize that an abnormal maximum amplitude (MA) on TEG, which reflects qualitative and quantitative platelet function, predicts a 25% reduction in platelet count on the complete blood count (CBC) 3 hours after initial presentation and initial TEG.

Methods

This is a prospective cohort study. Data collection will be take place at Regina General Hospital in Regina, SK. Ethical approval has been received from a harmonized review board at the University of Saskatchewan for Regina Qu'Appelle Health Region. After obtaining informed consent, 40 patients will be enrolled: 20 cases of coagulopathic parturients and 20 healthy controls. Inclusion criteria include parturients presenting with a platelet count of less than 120,000 mm^{-3}, severe preeclampsia, or other known coagulopathy. Participants will have initial lab work completed upon presentation, including a CBC, activated partial thromboplastin time (aPTT), prothrombin time/international normalized ratio (PT/INR), and a TEG. A follow up CBC, aPTT and PT/INR will be repeated three hours after initial lab work. Statistical analysis will involve linear regression analysis examining the relationship between TEG parameters and the conventional lab tests. Secondary outcomes include the following: whether an abnormal TEG predicts postpartum hemorrhage, whether TEG results assist anesthesiologists in their clinical decision making, whether an abnormal MA on TEG correlates with a platelet count of less than 75,000 mm^{-3}, and potential neurological complications.

Results

We are currently in the recruitment phase of this study.

Discussion

For most anesthesiologists, the choice of whether or not to perform a neuraxial technique depends on a combination of the patient's clinical scenario, absolute platelet count, as well as the experience and comfort level of the attending anesthesiologist. We hope to elicit whether thromboelastography a useful laboratory investigation to assist anesthesiologists in their management of thrombocytopenic parturients.

09:45 – 10:45 COFFEE BREAK & POSTER DISPLAYS
10:45 – 11:45 ORAL PRESENTATIONS – COMPLETED PROJECTS

A cross-sectional comparison of OR hat bacteria

Brent Francis,[1] Kristine Urmson,[1] Stephen Sanche,[2] Jennifer O'Brien,[1] William McKay[1]

[1]Department of Anesthesiology; [2]Department of Medical Microbiology and Infectious Disease

Introduction

Surgical site infections (SSIs) occur in 2-5% of patients, increase length of stay by 9.7 days and increase patient morbidity and mortality.[1] Most pathogens are from patients' own skin flora, mucous membranes or hollow viscera.[1] Operating Room (OR) attire outside the sterile field has not been shown to affect SSIs; however, outbreaks from scalp organisms while wearing disposable hats have been described.[2] Home laundering of scrubs is equivalent to hospital laundering when ironed or dried with heat.[3] Our local health region's policy requires disposable hats.

Methods

We conducted a cross-sectional study with a convenience sample of OR staff to compare bacterial counts on disposable vs. cloth OR hats. Nine unopened boxes of disposable hats were also sampled. Local REB deemed this project to be exempt from review. Following informed consent, we sampled OR hats for three weeks, between noon and 16:00. In addition, laundering habits were collected for cloth hats. Using a swab moistened with TSP broth, each hat was sampled above the eyes. The swab was incubated overnight in TSP broth. Day 2, broth turbidity was measured using a Genesys™ 10S Vis Spectrophotometer (Thermo Fisher Scientific). Turbidity guided dilution for non-selective sheep blood plating. Undiluted samples were plated on selective MacConkey and Denim-blue plates for Gram-negative bacteria and MRSA, respectfully. After incubating overnight, plates were scored and photographed. Questionable plates were gram stained to identify MRSA.

Results

We sampled 64 disposable and 41 cloth hats; 36 of 41 cloth hats were personally owned/laundered and 5 were owned/laundered by a private surgical facility. None of the hats grew MRSA. Turbidity of cloth hats was higher than disposable (P=0.003). Disposable hats had fewer colony forming units than cloth hats on non-selective sheep blood agar (P=0.014). There was no statistical difference in gram-negative culture growth between disposable and cloth hats (P=0.150). Cloth hats worn more than once without washing had higher turbidity than all hats worn only once (p=0.045). Hats worn more than once did *not* have more colony forming units on sheep blood agar (P=0.101). None of the hats grew MRSA. Eight of nine new boxes of disposable hats had positive growth on sheep blood agar; 75% had CFU's too numerous to count. Two of the eight boxes had turbidity among the highest in the study, but none grew gram negative or MRSA bacteria.

Conclusion

Cloth hats grew more bacteria on non-specific media, but did not grow more pathogenic bacteria than disposable hats. No hats grew MRSA and new boxes of disposable hats had higher than expected bacteria counts. Cloth hats should be washed/dried after each use.

References

1. Rev Obstet Gynecol. 2009;2(4):212-21.

2. Am J Infect Control. 1999;27(2):97,132-4.

3. J Hosp Infect. 2006;62(1):89-93.

Does single dose dexmedetomidine for procedural sedation reduce postoperative pain in total knee arthroplasty? A randomized control study

Nirupan Vipulananthan, Jennifer O'Brien, Jurgen Maslany

Department of Anesthesiology, University of Saskatchewan

Introduction

Dexmedetomidine has demonstrated benefits both in sedation and postoperative pain control, with less respiratory depression than other common sedatives. Traditionally, dexmedetomidine has been used with a large loading dose and infusion, which has been known to cause dose-dependent negative side-effects.[1] Single dose dexmedetomidine produces less negative side-effects, but still effective sedation and reduced postoperative pain.[2] There is evidence for its benefits with general anesthesia but only a few studies exist investigating its benefits when administered for sedation purposes with spinal anesthesia, and no studies primarily examine postoperative opioid consumption. We hypothesized that single dose dexmedetomidine for procedural sedation will reduce opioid consumption after total knee arthroplasty (TKA).

Methods

Fifty four patients undergoing spinal anesthesia for TKA were randomized to receive either normal saline (n=27) or 0.5 ug/kg dexmedetomidine (n=27) intravenously prior to spinal anesthesia. The primary outcome was morphine consumption in the first 24 hours following surgery. Secondary outcomes included a numeric rating scale for pain, motor and sensory blockade regression, intra-operative and postoperative side effects and length of stay in the post-anesthetic care unit (PACU).

Results

The mean (SD) cumulative morphine consumption after 24 hours in the dexmedetomidine group was 35.4mg (13.6) compared with 47.2 mg (19.5) in the normal saline group (mean difference 11.8 mg; 95% confidence interval 2.631 to 21.028; $P<0.01$). More patients in the dexmedetomidine group experienced hypotension during the operation (24 [Dex] vs. 17 [Normal saline]; $P=0.02$), and in PACU (22 [Dex] vs. 15 [Normal saline]; $P=0.04$), compared to the normal saline group. There were no significant differences in pain scores at 6, 12, and 24 hours, time to motor and sensory blockade regression, bradycardia, postoperative side effects, and length of stay in the PACU.

Conclusion

Single dose dexmedetomidine was associated with a significant decrease in morphine use in the first 24 hours and no difference in length of stay in the PACU following total knee arthroplasty. Our study demonstrates that a single dose of dexmedetomidine in patients receiving spinal anesthesia can produce effective intraoperative sedation and postoperative analgesic effects without significant side-effects. Single dose administration of dexmedetomidine may offer a more effective dosing strategy compared to traditional infusion regimens.

References

1. Abdallah FW, Abrishami A, Brull R. Anesth Analg. 2013;117:271-8.

2. Jung SH, Lee SK, Lim KJ, et al. J Anesth. 2013;27(3):380-4.

Subcutaneous ketamine for postoperative pain relief

Calen Sacevich,[1] William McKay,[1] Ben Semakuba,[2] Theo Twagirumugabe,[2] Jon Nyiligira[2]

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Introduction

Pain control is a fundamental right of every patient, and the ethical obligation of the physician.[1] Postoperative pain control in low resource and developing countries is often inadequately treated[2,3] and may expose patients to an increased risk of perioperative and long-term complications.[4] We evaluated the efficacy of subcutaneous ketamine administration for the management of postoperative pain in patients undergoing major surgery in a low resource setting.

Methods

Appropriate ethics approval was obtained from all institutions involved. Informed consent was obtained from all participating patients. Fifty-nine patients undergoing major abdominal, head & neck, plastic, gynecological surgeries were studied in a double blinded randomized control trial. In addition to standard care, patients received 5 subcutaneous injections of ketamine 1mg/kg (Group K; n=31) or normal saline (Group P; n=28) during the postoperative period. The first injection was administered immediately after surgery, and every 12 hours thereafter starting at 20:00 on the day of surgery. Pain was assessed three times per day using an 11-point verbal rating scale. Patients were also assessed for side effects: nausea and vomiting, hallucinations, nightmares, sedation, hypertension, and seizure.

Results

Patients in the interventional arm had lower visual analog scale pain rating than those receiving placebo (3.7 vs. 4.9, $p \leq 0.003$). Hallucinations and sedation were associated with ketamine administration when compared to placebo ($p \leq 0.001$, and $p \leq 0.003$, respectively).

Discussion

Subcutaneous administration of ketamine at a dose 1mg/kg is a safe and effective strategy to reduce postoperative pain in patients undergoing major surgery in low resource settings.

References

1. Brennan F, Carr DB, Cousins M. Anesth Analg. 2007. 105(1):205–21.

2. Ogboli-Nwasor E, Sule ST, Yusufu LM. J Pain Res. 2012. 5:117–20.

3. Ocitti EF, Adwok JA. East Afr Med J. 2000. 77(6):299–302.

4. Siddall PJ, Cousins MJ. Anesth Analg. 2004. 99(2):510–20.

A prospective randomized double blinded control trial using ketamine or propofol for electroconvulsive therapy: improving treatment-resistant depression

Grahme Weisgerber,[1] Henry Bi,[1] Jonathan Gamble,[1] Rudy Bowen,[2] Renuka Prasad[2]

[1]Department of Anesthesiology; [2]Department of Psychiatry, University of Saskatchewan

Introduction

Antidepressants form the core of treatment for major depressive disorder (MDD); however, their delayed onset of action and side effects are significant limitations. A well-established therapy for treatment resistant depression is electroconvulsive therapy (ECT). Propofol is the most commonly used induction agent for ECT. Ketamine has been shown to induce rapid and persistent antidepressant effects.

The purpose of this study was to look at the potential benefits of ketamine as an anesthetic agent for ECT in the treatment of medication resistant MDD. We hypothesized that a) ketamine based anesthesia for ECT when used for treatment resistant MDD would lead to significantly fewer required treatments to achieve a 50% reduction in depressive symptoms; and that b) the side effects of ketamine would be limited to the immediate anesthesia recovery period.

Methods

A prospective blinded randomized controlled trial with intention to treat analysis to investigate the effects of ketamine compared to propofol on ECT outcomes for the treatment of MDD. Patients were randomized to receive ketamine based anesthesia, ketamine 0.75 mg/kg, (KA) or propofol based anesthesia, propofol 1 mg/kg (PA) to facilitate a course of 8 ECTs.

All outcomes were defined a priori. The primary outcome was the number of ECTs required to achieve a 50% reduction from baseline score of the Montgomery Asberg Depression Rating Scale (MADRS). Secondary outcomes included number of ECTs required to achieve depression remission (MADRS < 10) and incidence of late (30 day) MDD recurrence (MADRS > 20). The results were compared using the log rank test, with a p value of less than 0.05 considered significant.

Results

After interim analysis of 27 of the intended 72 patients showed a significant difference between treatment groups, enrollment was stopped. A 28th patient had been enrolled prior to stopping the study. Unblinding of the data will occur once data collection is complete.

Discussion

Early remission from MDD carries significant benefits to the quality of life for patients and has the potential to drastically reduce utilization of hospital resources by way of earlier hospital discharge.