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Title: Anesthesia and Poliomyelitis: A Matched Cohort Study.

Citation: Anesthesia and Analgesia, Jun 2016, vol. 122, no. 6, p. 1894-1900, 1526-7598 (June 2016)

Author(s): Van Alstine, Luke W, Gunn, Paul W, Schroeder, Darrell R, Hanson, Andrew C, Sorenson, Eric J, Martin, David P

Abstract: Poliomyelitis is a viral infectious disease caused by 1 of the 3 strains of poliovirus. The World Health Organization launched an eradication campaign in 1988. Although the number of cases of poliomyelitis has drastically declined, eradication has not yet been achieved, and there are a substantial number of survivors of the disease. Survivors of poliomyelitis present a unique set of challenges to the anesthesiologist. The scientific literature regarding the anesthetic management of survivors of poliomyelitis, however, is limited and primarily experiential in nature. Using a retrospective, matched cohort study, we sought to more precisely characterize the anesthetic implications of poliomyelitis and to determine what risks, if any, may be present for patients with a history of the disease. Using the Mayo Clinic Life Sciences System Data Discovery and Query Builder, study subjects were identified as those with a history of paralytic poliomyelitis who had undergone major surgery at Mayo Clinic Rochester between 2005 and 2009. For each case, 2 sex- and age-matched controls that underwent the same surgical procedure during the study period were randomly selected from a pool of possible controls. Medical records were manually interrogated with respect to demographic variables, comorbid conditions, operative and anesthetic course, and postoperative course. We analyzed 100 cases with 2:1 matched controls and found that the peri- and postoperative courses were very similar for both groups of patients. Pain scores, postanesthesia care unit admission, length of postanesthesia care unit stay, intensive care unit admission, length of intensive care unit stay, and initial extubation location were not significantly different between the 2 groups. Looking at pulmonary complications in our primary outcome, there was no significant difference between the 2 groups (17% vs 14% for polio versus control, respectively; conditional logistic regression odds ratio = 1.5; 95% confidence interval, 0.7-3.3; P = 0.33). In addition, no difference was noted in those requiring a code or rapid response team intervention (4% vs 3% for polio versus control; P = 0.46) and the 30-day mortality rate was also not significantly different, with 2% of polio patients dying compared with 3% of controls (P = 0.79). The analysis of the primary outcome was repeated for the subset of patients with a history of poliomyelitis who had persistent neurologic deficits preoperatively (n = 36) and their matched controls (n = 72). In this subset analysis, there were 4 (11%) polio patients and 8 (11%) control patients who experienced pulmonary complications (conditional logistic regression odds ratio = 1.00; 95% confidence interval, 0.27-3.72; P = 1.00). The percentage of patients experiencing specific pulmonary complications of interest was similar between groups (postoperative mechanical ventilation: 6% vs 8% for polio and control patients, respectively; prolonged mechanical ventilation: 0% vs 1%; reintubation: 8% vs 4%; pulmonary infection: 6% vs 6%; and aspiration: 0% vs 1%). This study suggests that patients with a history of poliomyelitis do not seem to have an increased risk of pulmonary complications in the perioperative period. However, an odds ratio as great as 3.3-fold may be present.

Full Text: Available from Ovid in Anesthesia and Analgesia
Title: Combination of red cell distribution width and American Society of Anesthesiologists score for hip fracture mortality prediction.

Citation: Osteoporosis international : a journal established as result of cooperation between the European Foundation for Osteoporosis and the National Osteoporosis Foundation of the USA, Jun 2016, vol. 27, no. 6, p. 2077-2087, 1433-2965 (June 2016)

Author(s): Yin, P, Lv, H, Zhang, L, Long, A, Tang, P

Abstract: The prognostic value of red cell distribution width (RDW) and a combination of RDW and the American Society of Anesthesiologists (ASA) score for long-term hip fracture mortality remains unknown. Our data showed that both RDW and ASA were independent risk predictors. A combination of these two parameters may provide a more powerful strategy for the prediction of hip fracture mortality. Red cell distribution width (RDW) has recently been suggested as an independent predictor of prognosis in a variety of disorders. The American Society of Anesthesiologists (ASA) system has been widely used to stratify patients for outcome evaluations. However, the prognostic value of RDW and a combination of RDW and the ASA score for long-term hip fracture mortality has yet to be studied. This prospective cohort study included 1402 subjects from 2000 to 2011 with a follow-up study over a 2 year period. Cox proportional hazards models with a bootstrap validation were used to evaluate associations of RDW, ASA, and a combination of both with long-term mortality. The global fit and the area under the receiver operating characteristic (ROC) curve (AUC) for model discrimination were further analyzed. Both RDW and ASA exhibited as independent risk predictors of 2-year mortality. The population with elevation of either RDW or ASA increased the risk of mortality (bootstrap validated hazard ratio (HR) 1.971 95 % confidence interval (CI) [1.336-3.005] p < 0.01) while those with an increase in both assessments (bootstrap validated HR 2.667 95 % CI [1.526-4.515] p < 0.01) were at the highest risk for mortality. The addition of the combination of ASA and RDW improved the discrimination power of risk prediction models (AUC increased from 0.700 to 0.723, p < 0.05). Both RDW and ASA exhibited as independent risk predictors of 2-year hip fracture mortality. The combination of these two readily available parameters may provide a more powerful and effective strategy for the assessment of all-cause mortality in hip fracture patients.

Title: Monitoring of cerebral blood flow autoregulation in adults undergoing sevoflurane anesthesia: a prospective cohort study of two age groups.

Citation: Journal of clinical monitoring and computing, Jun 2016, vol. 30, no. 3, p. 255-264, 1573-2614 (June 2016)

Author(s): Goettel, Nicolai, Patet, Camille, Rossi, Ariane, Burkhart, Christoph S, Czosnyka, Marek, Strebel, Stephan P, Steiner, Luzius A

Abstract: Autoregulation of blood flow is a key feature of the human cerebral vascular system to assure adequate oxygenation and metabolism of the brain under changing physiological conditions. The impact of advanced age and anesthesia on cerebral autoregulation remains unclear. The primary objective of this study was to determine the effect of sevoflurane anesthesia on cerebral autoregulation in two different age groups. This is a follow-up analysis of data acquired in a prospective observational cohort study. One hundred thirty-three patients aged 18-40 and ≥65 years scheduled for major noncardiac surgery under general anesthesia were included. Cerebral autoregulation indices, limits, and ranges were compared in young and elderly patient groups. Forty-nine patients (37 %) aged 18-40 years and 84 patients (63 %) aged ≥65 years were included in the
study. Age-adjusted minimum alveolar concentrations of sevoflurane were 0.89 ± 0.07 in young and 0.99 ± 0.14 in older subjects (P < 0.001). Effective autoregulation was found in a blood pressure range of 13.8 ± 9.8 mmHg in young and 10.2 ± 8.6 mmHg in older patients (P = 0.079). The lower limit of autoregulation was 66 ± 12 mmHg and 73 ± 14 mmHg in young and older patients, respectively (P = 0.075). The association between sevoflurane concentrations and autoregulatory capacity was similar in both age groups. Our data suggests that the autoregulatory plateau is shortened in both young and older patients under sevoflurane anesthesia with approximately 1 MAC. Lower and upper limits of cerebral blood flow autoregulation, as well as the autoregulatory range, are not influenced by the age of anesthetized patients. Trial registration ClinicalTrials.gov (NCT00512200).

Title: The use of inhaled sevoflurane during operative hysteroscopy is associated with increased glycine absorption compared to intravenous propofol for maintenance of anesthesia.

Citation: Journal of clinical anesthesia, Jun 2016, vol. 31, p. 202-207, 1873-4529 (June 2016)

Author(s): Munmany, Meritxell, Gracia, Meritxell, Nonell, Roser, Cardona, Montserrat, Pons, Montserrat, Martin, Miriam, Alcolea, Antonia, Balasch, Juan, Carmona, Francisco

Abstract: To compare the effects of anesthesia maintenance drugs (inhaled sevoflurane versus intravenous propofol) used in general anesthesia on the absorption of glycine 1.5% solution during hysteroscopy. Prospective comparative study. Tertiary care university hospital. One hundred fifteen women undergoing hysteroscopy. Women were assigned to receive general anesthesia with inhaled sevoflurane (n = 77) or intravenous propofol (n = 38) to maintain anesthesia. The primary endpoint was clinically relevant glycine 1.5% absorption (>1000 mL), while secondary endpoints were the median of glycine absorption, operative time, complications and the incidence of discontinuation of the hysteroscopic procedure due to excessive glycine 1.5% absorption. Maintenance with sevoflurane produced significantly increased absorption of glycine 1.5% solution compared to intravenous anesthesia (264 vs 202 mL, P = .007). Clinically relevant absorption rates (>1000 mL) were observed in the sevoflurane group (P = .04) while none of the women receiving intravenous anesthesia reached this absorption level. No cases of severe post-operative hyponatremia (Na(+)<125 mmol/L) or adverse events derived from glycine 1.5% absorption were reported. No major complications (such as perforations, severe hemorrhage or infection) were presented during the interventions. The results of the present study show that the use of inhaled sevoflurane is associated with significantly increased glycine 1.5% absorption compared to intravenous propofol for the maintenance of anesthesia. However, further randomized controlled trials are needed to assess the possible mechanisms and risk factors involved in the higher absorption induced by sevoflurane. Copyright © 2016 Elsevier Inc. All rights reserved.

Title: The role of anesthesia in the prevention of postoperative delirium: a systematic review.

Citation: Minerva anestesiologica, Jun 2016, vol. 82, no. 6, p. 669-683, 1827-1596 (June 2016)

Author(s): Orena, Eleonora F, King, Adam B, Hughes, Christopher G

Abstract: Postoperative delirium (POD) is defined as an acute neurologic insult characterized by changes in consciousness and cognition, altered perception and a fluctuating course. It leads to poor outcome and increased health care system costs. Considering its high incidence, up to 60%, and the lack of a first-choice treatment, prevention has become a priority. Our aim was to systematically
review literature on POD prevention and to identify the role of anesthesia in this context. MEDLINE and EMBASE were searched for studies considering any anesthetic intervention intended to prevent POD. Risk of bias was assessed with the Quality Assessment Tool for Quantitative Studies for original articles and with the R-AMSTAR checklist for systematic reviews. A total of 27 studies were included. Interventions included pre-, intra-/peri- and postoperative strategies to prevent POD. Only 9 out of 27 studies had high methodological quality. Use of a depth of anesthesia monitor and lighter sedation had the strongest evidence in reduction of POD. Perioperative dexmedetomidine, ketamine, dexamethasone, and antipsychotic administration may reduce the risk of POD. Methodologically robust studies supporting strategies for preventing POD are still lacking. Based on our analysis, anesthesiologists should consider the intraoperative use of a depth of anesthesia monitor and the choice for a lighter sedation when possible. The administration of preventive medications should be considered very carefully. Considering the multifactorial nature of POD, however, the integration of effective preventive strategies into multidisciplinary programs is advisable and should be the target for future research.

Title: Effect of neuromuscular blockade reversal by pyridostigmine on spectral entropy values during recovery from desflurane anesthesia: a prospective, randomized, double-blind, controlled trial.

Citation: Korean journal of anesthesiology, Jun 2016, vol. 69, no. 3, p. 227-233, 2005-6419 (June 2016)

Author(s): Kim, Eugene, Ryu, Jae Hun, Byun, Sung Hye

Abstract: According to several studies investigating the relationship between muscle activity and electroencephalogram results, reversal of neuromuscular blockade (NMB) may affect depth of anesthesia indices. Therefore, we investigated the effect of pyridostigmine on these indices via spectral entropy. Fifty-six patients scheduled for thyroidectomy or parotidectomy were included in this study and randomized into two groups. At the start of skin suturing, the desflurane concentration was adjusted to 4.2 vol% in both groups. Following this, the pyridostigmine group (group P, n = 28) was administered pyridostigmine 0.2 mg/kg mixed with glycopyrrolate 0.04 mg/kg, while the control group (group C, n = 28) received normal saline. Entropy values (response entropy [RE] and state entropy [SE]), train of four (TOF) ratio, and end-tidal desflurane concentration were recorded from point of drug administration to 15 minutes post-drug administration. Mean RE values at 15 minutes, when the maximum effect of pyridostigmine was anticipated, showed a statistically significant difference between groups (53.8 ± 10.5 in group P and 48.0 ± 8.8 in group C; P = 0.030). However, mean SE at 15 minutes showed no significant difference between the two groups (P = 0.066). At 15 minutes, there were significant differences in the TOF ratio between the two groups (P < 0.001). NMB reversal by pyridostigmine significantly increased RE values but not SE values. This finding suggests that spectral entropy may be a useful alternative tool for monitoring anesthetic depth during recovery from anesthesia in the presence of electromyogram activity.

Full Text: Available from National Library of Medicine in Korean Journal of Anesthesiology

Title: Cardiac troponins and volatile anaesthetics in coronary artery bypass graft surgery: A systematic review, meta-analysis and trial sequential analysis.

Citation: European journal of anaesthesiology, Jun 2016, vol. 33, no. 6, p. 396-407, 1365-2346 (June 2016)
Author(s): Straarup, Therese S, Hausenloy, Derek J, Rolighed Larsen, Jens K

Abstract: Reports from animal studies indicate that volatile anaesthetics protect the myocardium against the effects of acute ischaemia-reperfusion injury by reducing infarct size. This cardioprotective effect in the clinical setting of coronary artery bypass graft (CABG) surgery, where the heart is subjected to global ischaemia-reperfusion injury, remains controversial. The objective was to demonstrate that clinical studies investigating the cardioprotective effect of volatile anaesthetics on cardiac troponins in CABG are no longer warranted. We also investigated the effect of volatile anaesthetics on cardiac enzymes in off-pump cardiac surgery. Systematic review of randomised clinical trials, meta-analyses and trial sequential analysis (TSA). Trials between January 1985 and March 2015 were obtained from electronic databases (Medline, Excerpta Medica Database (EMBASE), Cochrane Controlled Trial Register, abstracts from major anaesthesiology and cardiology journals and reference lists of relevant randomised trials and review articles. Relevant randomised clinical trials were included. We investigated the effect of volatile anaesthetics in both off-pump and on-pump CABG surgery with respect to troponin release [peak postoperative cardiac troponin I (cTnI) and cardiac troponin T (cTnT), cTnI/cTnT] and performed two separate meta-analyses. TSA was used to overcome the weakness of a type-1 error associated with repeated meta-analyses. From 30 studies, 2578 patients were pooled for the meta-analysis. The outcome significantly favours the use of peroperative volatile over non-volatile anaesthetics during on-pump CABG surgery with regard to peak postoperative cTnI (0.995 mg/l; standard mean difference, 95% confidence interval, -1.316 to -0.673; P < 0.001). Meta-analysis of 11 off-pump studies showed no difference in peak postoperative cTnI (0.385 mg/l; standard mean difference, 95% confidence interval, -0.857 to 0.087; P = 0.11). TSA indicated that the required information size for on-pump surgery was 1072 patients, and for off-pump surgery it was 1442; this latter figure has not yet been reached. Studies investigating the cardioprotective effect of volatile anaesthetics on cardiac troponins in on-pump CABG surgery are no longer warranted. This is not yet the case for off-pump surgery.

Title: Anaesthetic induction with etomidate in cardiac surgery: A randomised controlled trial.

Citation: European journal of anaesthesiology, Jun 2016, vol. 33, no. 6, p. 417-424, 1365-2346 (June 2016)

Author(s): Basciani, Reto M, Rindlisbacher, Antje, Begert, Esther, Brander, Luc, Jakob, Stephan M, Etter, Reto, Carrel, Thierry, Eberle, Balthasar

Abstract: Etomidate is perceived as preserving haemodynamic stability during induction of anaesthesia. It is also associated with adrenocortical dysfunction. The risk/benefit relationship is controversial. We tested the hypotheses that single-dose etomidate increases cumulative vasopressor requirement, time to extubation and length of stay in the ICU. Double-blind randomised controlled trial. Bern University Hospital, Switzerland, from November 2006 to December 2009. There were 90 patients undergoing coronary artery bypass grafts (CABG) and 40 patients undergoing mitral valve surgery (MVS). Reasons for noninclusion were known adrenocortical insufficiency, use of etomidate or propofol within 1 week preoperatively, use of glucocorticoids within 6 months preoperatively, severe renal or liver dysfunction, or carotid stenosis. CABG patients were allocated randomly to receive either etomidate 0.15 mg kg with placebo, propofol 1.5 mg kg with placebo or etomidate 0.15 mg kg with hydrocortisone (n = 30 in each arm). Risk stratification (low vs. high) was achieved by block randomisation. MVS patients received either etomidate 0.15 mg kg or propofol 1.5 mg kg (n = 20 in each arm). Cumulative vasopressor requirements, incidence of adrenocortical insufficiency, length of time to extubation and length of stay in ICU. Cumulative vasopressor requirements 24 h after induction did not differ between treatments in patients who underwent
CABG, whereas more noradrenaline was used in MVS patients following propofol induction (absolute mean difference 5.86 μg kg over 24 h P = 0.047). The incidence of relative adrenocortical insufficiency was higher after etomidate alone than propofol (CABG 83 vs. 37%, P < 0.001; MVS: 95 vs. 35%, P < 0.001). The time to extubation, length of stay in ICU and 30-day mortality did not differ among treatments. Within low and high-risk subgroups, no differences in vasopressor use or outcomes were found. In elective cardiac surgery, laboratory indicators of etomidate-induced adrenal insufficiency do not translate into increased vasopressor requirement or inferior early outcomes. ClinicalTrials.gov Identifier: NCT 00415701.

Title: Prone position results in enhanced pressor response to ephedrine compared with supine position during general anesthesia.

Citation: Journal of clinical anesthesia, Jun 2016, vol. 31, p. 94-100, 1873-4529 (June 2016)

Author(s): Xia, Jiangyan, Yuan, Jing, Lu, Xinjian, Yin, Ning

Abstract: To elucidate and compare the pressor response to ephedrine in the prone or supine position during general anesthesia (GA). Prospective cohort study. Department of General Surgery or Spine Surgery, Zhongda Hospital, Southeast University, Nanjing, China. Fifty-six patients who were scheduled to undergo elective surgery in the supine or prone position (n = 28 each) and using a generic GA protocol. During surgery, the patients received intravenous (IV) ephedrine when their systolic blood pressure (SBP) decreased to 90 to 110 mm Hg. Hemodynamic changes were measured at 1-minute intervals for 10 minutes and were compared with baseline. Forty-nine patients (23 in the prone position and 26 in the supine position) completed the study. There were no significant differences between the groups with regard to demographic characteristics, hemodynamic parameters, end-tidal concentration of sevoflurane, and dose of propofol and remifentanil (all P > .05). After the bolus injection of ephedrine, a significant increase in SBP was observed in both groups compared to baseline, but the duration and magnitude of the increase in SBP were longer and greater in the prone position than in the supine position. The magnitude of increase of the mean blood pressure was significantly greater in the prone position compared to the supine position at 2 to 7 minutes after ephedrine injection. Ephedrine could cause significant increase in diastolic blood pressure 2 minutes after IV injection, which could last until at least 9 minutes in the prone position compared to only for 5 minutes in the supine position group (all P < .05). Compared to the supine position, the prone position could augment the pressor response to IV ephedrine during GA. Further studies are recommended to identify its association with other confounding factors such as surgery type or duration, patient history of cardiovascular disease, or patient hydration status.

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Title: Transscleral resection without hypotensive anaesthesia vs iodine-125 plaque brachytherapy in the treatment of choroidal melanoma.

Citation: Eye (London, England), Jun 2016, vol. 30, no. 6, p. 833-842, 1476-5454 (June 2016)


Abstract: AimsThe aim of this study was to compare transscleral resection technique performed without hypotensive anaesthesia (TSRWH) with iodine-125 brachytherapy (IBT) in the treatment of choroidal melanoma. Patients and methodsThis was a retrospective surgical cohort study. Nineteen
eyes treated with TSRWH were matched with 53 eyes treated with IBT according to: tumour size, distance to fovea, distance to optic nerve, and follow-up time. Best-corrected visual acuity (BCVA), local recurrence, secondary enucleation, metastasis, overall and specific survival, and complications were evaluated.

Results
Patients treated with TSRWH had significantly better BCVA than those treated with IBT. The local recurrence risk was significantly higher when ciliary body was involved (HR=11.4, 95% CI 2.24-49.7, P=0.04). Metastatic disease was observed in 14 of 53 patients (26.4%) in the IBT group vs 3 patients (15.8%) in the TSRWH group (P=0.531). Multivariate analysis showed that iris involvement (HR=16.0, 95% CI 4.2-170.2, P=0.033) and large tumour (HR=2.3, 95% CI 1.2-4.8, P=0.04) increased the probability of metastasis. During follow-up, six patients (11.3%) in IBT group died vs two (10.5%) in the TSRWH group (P≥0.999). Nine patients required secondary enucleation: 5 (9.4%) in the IBT group vs 4 (21.1%) in the TSRWH group (P=0.231). The most common complications in IBT group were radiation-induced retinopathy (45.3%), neovascular glaucoma (28.3%), and macular oedema (24.5%), whereas rhegmatogenous retinal detachment (21.1%), ocular hypertension (21.1%), and submacular haemorrhage (15.8%) were the most frequent complications after TSRWH.

Conclusion
TSRWH is a technically challenging procedure. However, when performed successfully, this technique achieves better preservation of visual acuity than IBT and without the limitations inherent in hypotensive anaesthesia.

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Tables of Contents from July’s Anaesthesia journals

If you require full articles please email: library@uhbristol.nhs.uk

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Anesthesia & Analgesia
July 2016, Volume 123, Issue 1

Anesthesiology
July 2016, Volume 125, Issue 1

British Journal of Anaesthesia
July 2016, Volume 117, Issue 1

Current Opinion in Anaesthesiology
August 2016, Volume 29, Issue 4

New Guidance: NICE

Moderate to severe acute post-operative pain: fentanyl transdermal system
Reference number: ESNM77

New Guidance: AAGBI

The use of blood components and their alternatives 2016
Latest relevant Systematic Reviews from the Cochrane Library

High initial concentration versus low initial concentration sevoflurane for inhalational induction of anaesthesia

Quick exercise

Sensitivity and Specificity

**Sensitivity:**
If a person has a disease, how often will the test be positive (true positive rate)?

If the test is highly sensitive and the test result is negative you can be nearly certain that they don’t have disease.

**Specificity:**
If a person does not have the disease how often will the test be negative (true negative rate)?

If the test result for a highly specific test is positive you can be nearly certain that they actually have the disease.

Quick Quiz:

1. A very sensitive test, when negative, helps you:
   a: Rule-in disease
   b: Rule-out disease
   c: Confuse medical students
   d: Save money

2. A test which is highly specific, when positive, helps you:
   a: Rule-in disease
   b: Rule-out disease
   c: Confuse medical students
   d: Save money

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