SCA1

IMPACT OF BLOOD GLUCOSE LEVEL ON POSTOPERATIVE OUTCOME IN 212 PATIENTS WITH ACUTE TYPE A AORTIC DISSECTION

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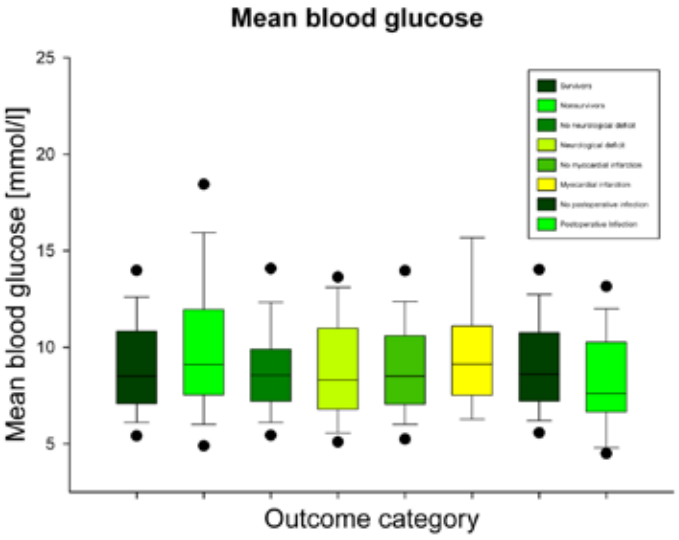
Background : Tight blood glucose (BG) control during intensive care has been shown to improve survivaland reduce morbidity in cardiac surgery (1). Observational studies found intraoperative hyperglycemia incardiac surgery (2,3) and increased BG variability in intensive care (4) to be independent risk factors formorbidity and mortality. However, a recent study in elective, low-risk cardiac surgery failed to show anadditional effect of intraoperative tight glucose control on postoperative outcome (5). Aim of the study: To evaluate the significance of intraoperative BG indices for perioperative outcome inpatients undergoing emergent surgery for acute type A aortic dissection. Materials and Methods: 212 consecutive anesthesia records and hospital charts of patients undergoingsurgery with hypothermic circulatory arrest (HCA) for acute type A aortic dissection were analyzed.Intraoperative BG index values (BG peak; mean; SD and coefficient of variability (SD*100/mean BG);BG on admission), demographics and outcome data (mortality, persistent neurological deficit, myocardialinfarction, and length of stay in the intensive care unit (LOS ICU)) were extracted. Statistics: Associationsbetween BG indices and outcome were analyzed. Results and Discussion: There were 434 BG measurements, yielding up to n = 212 independent BG indexvalues. Demographic data, HCA duration, and BG indices were not significantly different between thefollowing outcome categories: survivors/nonsurvivors; persistent neurological deficit yes/no, myocardialinfarction yes/no (figure 1). Coefficient of BG variability (n=156) was significantly but very weaklycorrelated to mortality and LOS ICU (Spearman correlation coefficient r 0.10 and 0,21; p = 0.04 and 0.03,respectively). No other significant association between BG indices and outcome variables was found. Conclusion: In our cohort of 212 patients undergoing surgery with hypothermic circulatory arrest for acutetype A aortic dissection, there was no clinically relevant association between intraoperative BG indicesand outcome. References: 1) Eur Heart J 2006;27:2716. 2) J Thor Cardiov Surg 2005;130:1144. 3) Mayo Clin Proc2005;80:862. 4) Anesthesiology 2006; 105: 244. 5) Ann Int Med 2007;146:233.



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SCA2

TRANSESOPHAGEAL ASSESSMENT OF RIGHT VENTRICULAR FUNCTION DURING ONE LUNG VENTIALTION IN NONCARDIAC THORACIC SURGERY

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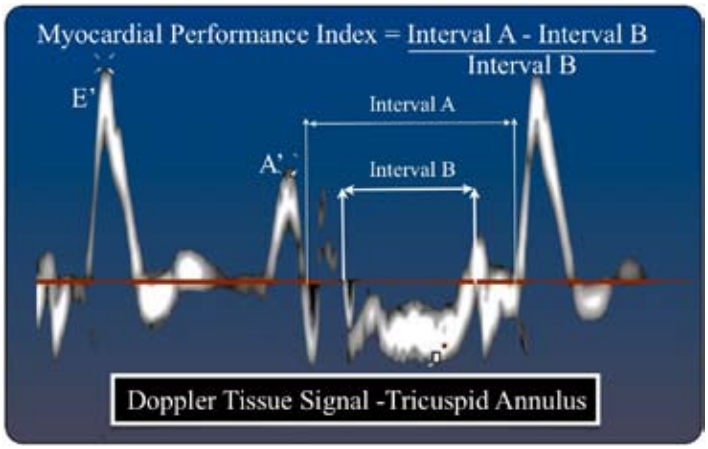
INTRODUCTION: Supraventricular tachyarrhythmia (SVT), including atrial fibrillation, is a commoncomplication after thoracic surgery, with a 10-20% incidence after lobectomy and 40% incidence afterpneumonectomy . One hypothetical etiology of post-surgical SVT is transient right ventricular (RV)dysfunction. We utilized Myocardial Performance Index (MPI) to assess changes in RV function with lungisolation. MPI is a well known index that is relatively heart rate and load independent and has beenutilized to assess left and recently right ventricular function. We hypothesized that patients who develop anabnormal MPI may be at risk for postoperative SVT. MATERIALS AND METHODS: After IRB approval and written informed consent, we prospectivelyenrolled patients undergoing thoracic lung surgery. A baseline transesophageal echo (TEE) examinationwas performed after induction of general anesthesia, and repeated 10 minutes after institution of one lungventilation. MPI was measured from the spectral Doppler tissue pattern obtained from the tricuspidannulus in the mid-esophageal four-chamber position (Figure 1). Patients were followed during theirhospital stay. Fishers Exact Test was performed to assess changes in MPI and its relationship withpostoperative arrhythmias. P0.05 was considered significant. RESULTS: 24 patients completed the study. In 8/24 patients the MPI increased after lung isolation. Wefound a 50% incidence of SVT in these subjects, which was statistically higher than subjects whose MPIdid not change or decreased (50% vs. 6%; P=0.028; table). The incidence of postoperative SVT washighest among subjects who had a normal baseline MPI (< 0.40) that increased with lung isolation (4/5;80%; P=0.002 vs. patients with an MPI>0.40). CONCLUSION: Patients with an increase in MPI with lung isolation had a higher incidence ofpostoperative SVT. MPI measurement may identify patients with acute RV dysfunction during one lungventilation. Acute RV dysfunction may be responsible for postoperative SVT. Reference: 1. David Amar, Hoa Zhang, Alan H. Kadish. Older age is the strongest predictor of postoperative atrialfibrillation. Anesthesiology 2002; 96: 352-6

MPI	No Arrhythmia	SVT
Increased from baseline	4	4*
Decreased from baseline	15	1

*P= 0.028



SCA3

CONTINUOUS INSULIN INFUSION HAS THE POTENTIAL TO DECREASE THE INCIDENCE OF PERIOPERATIVE MYOCARDIAI INFARCTION IN PATIENTS UNDERGOING LOWER EXTREMITY BYPASS SURGERY AND ABDOMINAL AORTIC ANEURYSM SURGERY

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Beth Israel Deaconess Medical 30th Annual Meeting & Workshops

Background: The beneficial effect of continuous insulin infusion in vascular surgical patients is unknown. We hypothesized that this strategy may reduce myocardial infarction (MI) when compared to intermittent insulin boluses for perioperative blood sugar control following vascular surgery (lower extremity bypass surgery and abdominal aortic aneurysm surgery).

Methods: 250 patients were enrolled in this prospective, single blinded, single center trial and randomized to insulin infusion and intermittent insulin (4 hourly) groups. 5 patients were excluded from the study due to protocol violations. Both groups had a glucose target of 100-150mg/dL. Both the groups had a strict protocol based insulin treatment for 48hours from the start. Analysis was done as intention to treat basis.

The primary outcomes were 30 days post-surgery death, MI and congestive heart failure (CHF). All patients had a minimum of 6 hourly blood sugars. The secondary outcomes were reoperations, infections and length of stay. All outcome data were predefined. The primary outcome data, MI and the composite of MI and CHF were analyzed with Fisher exact test. Chi-square tests and t-tests were used for other analyses as appropriate.

Results: Table 1, 2 and 3 shows the comparable demographic and surgical data. The incidence of perioperative myocardial infarction was significantly lower in the continuous insulin infusion group. The secondary outcomes and CHF were similar between the two groups.

Discussion: This is the first prospective randomized study to provide beneficial effects of continuous insulin infusion as evidenced by the confidence intervals for the risk rate of MI. Even though the blood sugar target was similar in the groups, tight glucose control has provided less variability and a lower blood glucose level in the immediate postoperative period up to 24 hours as shown in Table 3. After 8 hours to 24 hours from the start of the study, the separation of blood sugar is clear. In postoperative day 2 both groups had similar blood sugar control. This data provides evidence for regular practice of continuous insulin infusion to a target of 100-150 mg/dL in this setting.

References:

1. Egi M, Bellomo R, et al. Variability of blood glucose concentration and short-term mortality in

critically ill patients. Anesthesiology 2006; 105: 244-252.

Table 1. Patient Characteristics

	N=119 (Infusion group)	N=126 (Intermittent bolus)
Age (yrs)	67 ± 10	70 ± 11
Sex (M/F)	71/49	67/59
Height (cms)	169 ± 10	169 ± 10
Weight (kilos)	84 ± 23	80 ± 24
Diabetes (%)	65 (55)	68 (54)
HTN (%)	97 (82)	98 (78)
CAD (%)	61 (51)	73 (58)
CABG (%)	26 (22)	36 (29)
CRF (%)	16 (13)	15 (12)
Preoperative CVA (%)	20 (17)	15 (12)
COPD	26 (22)	31 (25)
DM On Insulin (%)	41 (34)	40 (32)
Aspirin	102 (86)	103 (82)
Beta blockade (%)	87 (73)	100 (79)
Metformin (%)	9 (8)	14 (11)
Glyburide (%)	23 (19)	20 (16)

Table 2. **Surgery Charactertistics:**

	N=119 (Infusion group)	N=126 (Intermittent bolus)	'p' value
ASA Physical status 2/3/4	10 (8.5%) / 99 (83%) / 10 (8.5%)	4 (3%) / 106 (84%) / 16 (13%)	0.14
Duration of surgery (min)	197 ± 76	199 ± 78	0.82
Abdominal aortic aneurysm (59)	25	34	0.50
Lower extremity bypass (182)	91	90	
Amputation (5)	3	2	

Table 3. Blood sugar data

Blood sugars (mg/dL)	N=119 (Infusion group)	N=126 (Intermittent bolus)	'P' value
0 hour	141 ± 46	136 ± 50	0.743
4 hours	130 ± 47	126 ± 25	0.747
8 hours	127 ± 39	131 ± 35	**0.496**
12 hours	125 ± 35	141 ± 48	**0.013**
16 hours	123 ± 30	141 ± 48	**0.008**
20 hours	126 ± 28	148 ± 48	**0.002**
24 hours	129 ± 31	148 ± 55	**0.015**

Table 4. **Surgical outcomes**

	N=119 (Infusion group)	N=126 (Intermittent bolus)	'P' value	Risk Ratio (95%confidence interval)
MI	1 (0.8 %)	7 (5.6%)	**0.06**	**0.15[0.02-1.20]**
CHF	4 (3.3%)	8 (5.5%)	0.40	0.60[0.2-2.0]
Composite (MI and CHF)	5 (4.2%)	13 (10.3 %)	0.06	0.4[0.15-1.1]
Acute renal failure	28 (24%)	24 (19 %)	0.57	0.8[0.4-1.6]
Wound infection	28 (24%)	21 (17 %)	0.19	1.4[0.3-2.3]
Return to Operating room	13 (11 %)	18 (14%)	0.29	
Hospital length of stay (days) Median (25%-75% IQR)	6 (5-8)	7 (5-9)	0.18	

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SCA4

TIGHT GLUCOSE CONTROL MAY PROVIDE BENEFICIAL CARDIOPROTECTIVE EFFECTS IN NON-DIABETICS BUT NOT IN DIABETICS UNDERGOING VASCULAR SURGERY

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Background:
Tight management of peri-operative glucose reduces morbidity after cardiac surgery, but less is know about its effects in other types of surgery. It is uncertain whether tight glycemic control via continuous infusion of insulin could reduce risk of morbidity in diabetics, non diabetics, or both. We hypothesized that tight glycemic control benefits diabetics more than non-diabetics.

Methods:
As part of a prospective, randomized, single-blinded trial, 250 patients, (both diabetic and non-diabetic) scheduled for elective major vascular surgery were voluntarily enrolled. 5 patients were excluded from the study for protocol violations and cancellations. Patients were randomized to receive both bolus insulin and continuous infusion or only insulin by bolus. Both groups had glucose checked q 4 hours; the target blood glucose for both groups was 100-150 mg/dl for the 48 hours from the start of surgery. The endpoint was major adverse outcomes (MAE) within 30 days of surgery including myocardial infarction and acute congestive heart failure.

Results:
Demographics were similar between groups, as was the distribution of diabetics and non-diabetics in each of the protocol groups. (Table 1) There were no deaths in either group. There was no statistical difference between incidences of the outcomes between groups. While not statistically significant, the relative risk of myocardial infarction in the non-diabetic group suggests a trend toward decreased events in those non-diabetics receiving insulin infusions. (Table 2)

Conclusion:
The trend toward reduction in relative risk of MI for non diabetics receiving insulin infusions is noteworthy given that non-diabetics are not traditionally monitored or treated aggressively for glycemic control in the peri-operative period. The protective effect of tighter glycemic control via infusion may therefore be more pronounced in this group. This analysis is limited, as the study was not powered to detect differences between diabetics and non-diabetics; more randomized trials should be undertaken toverify and further evaluate the effects of insulin on outcomes.

References:
1. Gandhi GY et al. Intensive intraoperative insulin therapy versus conventional glucose management during cardiac surgery: a randomized trial. AIM 2007;20:233-243.

2. Krinsley JS. Effect of an intensive glucose management protocol on the mortality of critically ill adult patients. Mayo Cln Proceedings. 2004;79:992-1000.

3. Rady MY et al. Influence of individual characteristics on outcome of glycemic control in intensive care unit patients with or without diabetes. Mayo Clin Proceedings 2005;80:1558-1567.

Table 1: **Patient Characteristics**

	Infusion Group N=119	Bolus Only Group N=126
Age (yrs)	67 ± 10	70 ± 11
Sex (M/F)	71/49	67/59
Height (cms)	169 ± 10	169 ± 10
Weight (kilos)	84 ± 23	80 ± 24
Diabetes (%)	65 (55)	68 (54)
HTN (%)	97 (82)	98 (78)
CAD (%)	61 (51)	73 (58)
CABG (%)	26 (22)	36 (29)
CRF (%)	16 (13)	15 (12)
Preoperative CVA (%)	20 (17)	15 (12)
COPD	26 (22)	31 (25)
DM On Insulin (%)	41 (34)	40 (32)
Aspirin	102 (86)	103 (82)
Beta blockade (%)	87 (73)	100 (79)
Metformin (%)	9 (8)	14 (11)
Glyburide (%)	23 (19)	20 (16)

Table 2: **Endpoints**

	Infusion	Bolus Only	'p' value	Relative Risk	95% CI
MI					
Non Diabetics (%)	0 (0)	4 (7)	0.15	0.12	0.01-2.16
Diabetics (%)	1 (1.6)	3 (4.5)	0.62	0.35	0.04-3.27
CHF					
Non-Diabetics	2 (3.7)	5 (8.5)	0.44		
Diabetics (%)	2 (3.0)	3 (4.4)	1		
Composite					
Non-Diabetics (%)	2 (3.7)	9 (15.5)	0.13	0.31	0.07-1.40
Diabetics (%)	3 (4.6)	6 (8.0)	0.53	0.52	0.14-2.00

SCA5

EVALUATION OF PULSE PRESSURE VARIATION AND CORRECTED FLOW TIME AS PREDICTORS OF FLUID RESPONSIVENESS DURING ONE-LUNG VENTILATION

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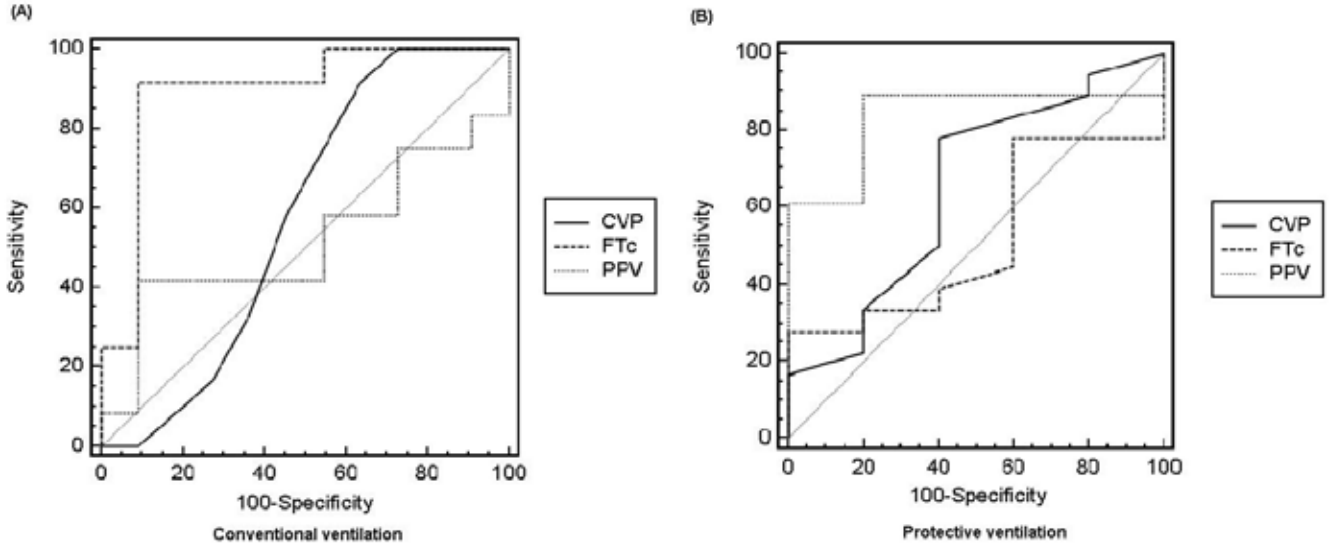
Background. Pulse pressure variation (PPV) and corrected flow time (FTc) have reported to predict fluid responsiveness in mechanically ventilated patients. We evaluated the ability of PPV and FTc to predict fluid responsiveness in patients receiving one-lung ventilation (OLV).

Methods. Forty-six patients undergoing thoracic surgery requiring one-lung ventilation were included in this study. Patients were randomized either to Group C (patients receiving conventional OLV) or Group P (patients receiving protective OLV).Thirty-minutes after one-lung ventilation, PPV, FTc, central venous pressure (CVP), and cardiac index (CI) were measured at baseline and 12 minutes after fluid loading with 6% hydroxyethyl starch solution (7 ml/ kg) in both groups. In Group C, patients were ventilated with tidal volume of 10 ml/kg ideal body weight, inspired oxygen fraction (FIO2) of 1.0, and no positive end-expiratory pressure (PEEP). A respiratory rate was adjusted to maintain to maintain end-tidal carbon dioxide at 35-40 mmHg in Group C. In Group P, patients were ventilated with at a tidal volume of 6 ml/kg, FIO2 of 0.6-0.9 and 5 cmH2O PEEP. A respiratory rate was set at 15 cycles/min in Group P. The correlation between changes in CI and in initial haemodynamic variables was assessed using Pearsons correlation. Receiver operating characteristic (ROC) analysis was used to evaluate the predictive value of PPV, FTc, and CVP to the response to volume expansion, as defined by an increase in CI of 15% or more.

Results. FTc before fluid expansion correlated significantly with changes in CI in Group C ($R = -0.479$, $P<0.05$). However, in Group P, PPV before volume loading was found to correlate significantly with changes in CI ($R = 0.423$, $P<0.05$). Patients were classified as the responders to fluid loading, when increases in CI were ³ 15%, or as the non-responders when increases were < 15%. In Group C, a threshold FTc value of 345 ms allowed discrimination between the responders and the non-responders with a specificity of 91% and a sensitivity of 92%. Mean areas under ROC curves were 0.576 ± 0.121 for CVP, 0.894 ± 0.07 for FTc, and 0.515 ± 0.123 for PPV in Group C. In addition, the area under ROC curves for FTc was significant greater than those of CVP and PPV in Group C ($P<0.05$). However, in Group P, a threshold PPV value of 4.9% allowed discrimination between the responders and the non-responders with a specificity of 80% and a sensitivity of 89%. Mean areas under ROC curves were 0.650 ± 0.149 for CVP, 0.517 ± 0.148 for FTc, and 0.833 ± 0.09 for PPV in Group P. However, no significant difference was found among areas under ROC curves for CVP, FTc, and PPV in Group P.

Conclusion. When appropriately used, FTc can predict fluid responsiveness in patients receiving conventional OLV in contrast to PPV. However, in patients receiving protective OLV, no preload index may predict fluid responsiveness.



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SCA6

DESCENDING THORACIC AORTIC CROSS-CLAMPING CAN CHANGE A PHARMACOKINETICS OF PROPOFOL IN HUMANS.

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Introduction) Recently, we experienced many cases in which plasma propofol concentrations (Cp) increased after aortic cross-clamping (AXC) in thoracic aortic aneurysm repair surgery during propofol anesthesia, suggesting that a pharmacokinetics of propofol may be changed during AXC. Since indocyanine green (ICG) is known to have similar distribution and elimination of propofol, we investigated using ICG test (DDG analyzer, Nihon Koden, Japan) in this study whether a pharmacokinetics of propofol may be changed after AXC, or not.

Materials and Methods) Prospectively, in 6 patients undergoing thoracic aortic surgery under total intravenous anesthesia using propofol, BIS values were recorded during AXC. In this study, the rate of propofol infusion was controlled to keep the BIS value between 30 and 60 throughout a surgery. Simultaneously, Propofol concentration (Cp) in the blood samples taken from the right radial artery (area proximal to AXC) and the left femoral artery (area distal to AXC) were measured. 20 mg ICG was injected via a CVP catheter at pre-, intra- and post-AXC. ICG plasma concentrations were measured by percutaneuos probe and then ICG distribution volume at pre-, intra- and post-AXC were calculated by DDG analyzer. BIS values, plasma propofol concentrations of radial arterial blood and Distribution volume of ICG were analyzed by means of repeated measures analysis of variance. When significant, an appropriate multiple comparison method (Dunnetts t test) was applied to assess differences between before and during AXC of the DTA or after the declamping.

Results) About 20 min after initiating AXC, BIS values in all cases started to decrease abruptly. Cp of samples taken from the radial artery afterAXC were significantly ($P<0.05$) elevated compared with pre-cross-clamp values (1.8 ± 0.4mg/ml) and the mean concentration at 20, 30, and 45 min after aortic cross-clamping was 3.4 ± 0.4, 5.3 ± 1.5, and 3.0 ± 0.9 mg/ml, respectively. Distribution volume of ICG was calculated as 4.13 +/- 1.05 L at pre-AXC. At 20 min of AXC (intra-AXC) distribution volume of ICG was significantly decreased to 1.82 +/- 0.37 L.

Conclusion) This is the first report to show a possibility of changing propofol pharmacokinetics during AXC. According to our date, this changs may be associated, in part, with a decrease of its distribution volume after AXC.

SCA7

FACTORS ASSOICATED WITH RENAL DYSFUNCTION AFTER BILATERAL ORTHOTOPIC LUNG TRANSPLANT

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Purpose: Many clinicians perceive fluid restriction to be the key determinant of Renal Dysfunction (RD) after Lung Transplant (LT). However preliminary data identified tobramycin use as a risk factor. This did not account for colonization with multiresistant organisms, other renal toxins, or perioperative complications and showed increased delta creatinine at POD 30 (%dCr30) to be associated with death or dialysis at one year. Our purpose was to test the hypothesis that the aminoglycoside tobramycin was a major risk factor for %dCr30 after LT.

Methods: We retrospectively reviewed consecutive, adult, primary, off-pump bilateral LT patients between January 2000-2006 (n=215). Risk factors were tested in multivariable linear regression models to determine association with the outcome %dCr ((postop creatinine-baseline creatinine)/baseline creatinine)* 100) at POD 30. Co-variates in the model included : preop diabetes, baseline creatinine (Cr, all within normal range) post op SVT, postop fungal colonization, preoperative pulmonary colonization (0 none, 1 multiresistant organisms, 2 multiresistant organisms requiring i.v. tobramycin), use of inhaled colistin or inhaled tobramycin, coverage with 2 beta-lactam antibiotics, total blood products transfused and serious perioperative complication (OpComp e.g. hemorrhage).

Results: As shown in Table 1 in order of magnitude, OpComp, baseline Cr, and multiresistant organisms requiring i.v. tobramycin were independently associated with %dCr30. Surprisingly, diabetes, inhaled Tobramycin, and inhaled colistin therapy were not associated with %dCr30.

Conclusions: While tobramycin requirement confers greater risk than colonization with multiresistant organisms alone we cannot determine whether the infectious agent or the antibiotic causes the %dCr30, and the importance of OpComps (e.g. hemorrhage, perioperative sepsis, primary graft dysfunction, postop MI and lobar infarction,) far outweigh risk associated with intravenous tobramycin. Non-nephrotoxic medications with equivalent antimicrobial activity may reduce the risk of RD after LT. Perioperative complications may be beyond the control of anesthesiologists, but, given their importance we must remain vigilant to identify complications early.

(1) Kuitunen A. Ann Thorac Surg (2006)

(2) Palmer SM. Am J Transpl (2005)

Table 1

Source	F Value	P value
ABREGIMEN	4.44	0.0130
DIABETES	3.28	0.0718
CR0	10.66	0.0013
OPCOMP	13.52	0.0003

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SCA8

IS EXTUBATION IN THE OPERATING ROOM (OR) AFTER IVOR-LEWIS ESOPHAGECTOMY SAFE?

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Background: Early extubation after Ivor-Lewis esophagectomy remains controversial. The aim of this study was to evaluate the timing of extubation on anesthetic and surgical outcomes in patients who underwent Ivor-Lewis esophagectomy.

Methods: 58 consecutive charts were analyzed retrospectively. Early extubation (EE) occurred in the operating room (OR), while late extubation (LE) occurred in the post anesthesia care unit (PACU). Independently from the time of extubation, all patients spent the night in the PACU. They all received epidural PCA for intraoperative and postoperative analgesia. Standard t-test and Chi square were used for statistics.

Results: There were 31 EE and 27 LE patients who underwent surgery between January and July 2007. Characteristics of the two groups are summarized in the table below. Preoperative co-morbidities did not differ between the two groups. EE patients had shorter surgical procedures (347±81 vs. 399±87 min, p=0.02), less intraoperative estimated blood loss (EBL) (0.4±0.2 vs. 0.6±0.4 L, p=0.03) and required less iv fluids up to the first 12 hours in the PACU (3.9±1.2 vs. 4.7±2.0 L, p=0.03). There was a trend for fewer EE patients (19/31 vs. 23/27, p=0.08) requiring supplemental O2 once on the surgical floor and for a significantly shorter period of time (3.0±5.6 vs. 6.2±7.5 days, p=0.009, Mann-Whitney test). There was no difference in the incidence of postoperative complications, such as atrial fibrillation, aspiration, pneumonia, wound infection, anastomotic leak or need for reintubation between the two groups. Hospital length of stay and 30-day mortality were also not statistically different between the two groups.

Conclusions: These preliminary data suggest that extubation in the OR after esophagectomy can be considered safe in selected patients. Shorter duration of surgery with low EBL and subsequently diminished requirement for fluid resuscitation seem to be associated with the ability to successfully extubate early.

Data are presented as mean±standard deviation, and number (% of the total).

	EE (n=31)	LE (n=27)	p
Male (%)	17 (54.8)	21 (77.8)	0.07
Age (years)	61±11	64±11	0.28
Height (cm)	168 10	170±9	0.34
Weight (kg)	79±19	84±22	0.33
BMI	28±5	29±6	0.42
FEV1 % predicted	97±10	94±22	0.54
DLCO % predicted	93±19	88±22	0.39
CAD	3 (5)	5 (9)	0.33
HTN	12 (21)	11 (19)	0.33
DM	6 (10)	3 (5)	0.38

SCA9

A RANDOMIZED, DOUBLE BLINDED, PLACEBO CONTROLLED CLINICAL TRIAL OF THE USE OF KETAMINE IN THORACIC SURGERY

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Introduction: Previous studies of cardiac and thoracic surgery patients have shown increased levels of interleukin-6 (IL-6) and C-reactive protein (CRP) plasma levels postoperatively. IL-6 has been shown to be a predictor of increased morbidity and surgical complications while CRP is a marker of inflammation and a predictor of poor outcomes in cardiac patients. A single dose of 0.5 mg/kg ketamine has been shown to reduce IL-6 and C-reactive protein (CRP) plasma level following cardiac surgery, but no study has been performed to study the effects of ketamine in thoracic surgeries. We hypothesized that patients who received ketamine during thoracic surgery might benefit from suppression of the inflammatory cascade, represented by lower IL-6 and CRP plasma levels, leading to lower incidences of complications after thoracic surgery.

Methods: This study was a randomized, double blinded, placebo controlled clinical trial of ketamine in patients undergoing thoracic surgery at Duke University. After receiving institutional IRB approval, patients who were scheduled to have lung lobectomy surgery were approached in the preoperative clinic.

Exclusion criteria included: age less than 18 years, recent myocardial infarction (6 months), a history of psychotic disorder, uncontrolled hypertension, allergy to ketamine, an acute intracranial process, increased intracranial or intraocular pressure. A total of 40 patients were randomized to receive either 0.5mg/kg ketamine or an equivalent volume of normal saline intravenously prior to chest wall incision. The study was designed to provide 90% power to detect a change in IL-6 of 20 pg/ml from a mean of 100 pg/ml, with two tailed alpha = 0.05. Pain scores, rated by the patient on a scale of 0-10, were recorded preoperatively, at 4 and 24 hours postoperatively, and prior to discharge. Blood samples were taken prior to induction of anesthesia and at 24 hours postoperatively. The blood samples were then assayed for IL-6 and CRP levels. CRP levels were measured by the institutional laboratory using rate nephelometry. IL-6 plasma levels were measured using a commercially available multi-cytokine detection system that utilized dyed microparticles coated with analyte specific antibodies (Beadlyte, Upstate, Temecula, CA) and a dual laser, flow-based sorting system (Luminex, Austin, TX).

Results: IL-6 plasma levels did not significantly differ at 24 hours for patients receiving ketamine (245 ± 287 pg/ml, mean ± SD) compared to patients who received placebo (269 ± 210 pg/ml) p=0.39.

Additionally, CRP levels at 24 hours were not significantly different (8.8 ± 4.5 mg/dL for ketamine, 9.3 ± 5.6 mg/dL for placebo patients), p=0.37. Finally, verbal pain scores were not significantly different between patient groups at 4 (3.8 ± 2.1 for ketamine, 3.1 ± 2.8 for placebo, p=0.20), 24 hours (2.6 ± 2.2 for ketamine, 2.8 ± 2.1 for placebo, p=0.37), or at discharge (1.8 ± 2.5 for ketamine, 1.1 ± 1.8 for placebo, p=0.15).

Conclusions: These findings suggest that routine use of a single dose of ketamine prior to chest wall incision is not effective at reducing pain or inflammation in thoracic surgery patients in the immediate post-operative period.

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SCA10

A SEVEN-YEARS EXPERIENCE OF INTRAOPERATIVE AWAKE GENERAL ANESTHESIA WITH REMIFENTANIL FOR THE CAROTID ENDARTERECTOMY

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Introduction

We present the results of an anesthetic procedure using only an analgesic in patients who were intubated and ventilated but with a level of consciousness that allowed us to evaluate the neurologic status during carotid clamping.

Methods

From July 1999 to August 2007, 1120 patients (773 men, 347 women)with a mean age of 70 years, ASA II-III, underwent surgical carotid endarterectomy(CEA). The wake-up test procedure was explained to each patient the day before surgery and all gave informed consent. Standard monitoring included electrocardiogram with continuous ST-T analysis, pulse oximetry, and invasive blood pressure with a radial catheter(1). Recently, depth of anesthesia was monitored by using bispectral index score (BIS) installed before induction. The anesthetic protocol began by perfusion of 0.1-0.2 mcg/Kg.min of remifentanil combined with propofol(1 mg/kg) and mivacurium (0.15 mg/kg); local anesthesia of the glottis with 5% lidocaine spry was performed before orotracheal intubation and the patient was ventilated with an air/02 mixture and sevoflurane at 1.5 MAC was administered in 10 min. The area of skin to be cut was soaked in ropivacaine 7.5 mg/ml. For maintenance the dose of remifentanil was regulated to permit a clinical neurologic evaluation during and after carotid clamping and to control anxiety, restlesseness, pain, and discomfort of the tracheal tube (range: 0.04-0.63 mcg/kg.min). The aneshetist remained in costant verbal contact with the patient which have to move the arm controlateral to surgery. In the last year remifentanil was administered by target controlled infusion (TCI) with an effect-site concentration of 1 ng/mL according to hemodynamics and BIS value (Minto model, Rugloop). All patients were extubated within a few minutes at the end of the surgery.

Results

At the time of carotid cross-clamping,834(74.5%) patients showed no signs of neurological deficit,45(4%) requested a heavy sedation for restlessness, 241(21.5%) patients showed unconsciousness or arm plegia that disappeared increasing blood pressure and in 61 of those positioning the carotid shunt (Tab1). Blood pressure and heart rate incresed often during the neurologic evaluation, but changes were corrected quickly with the treatment used. No alterations attributable to hemodynamic instability occured.Postoperative complications are reported in Tab 2.

Discussion

Our technique allowed: 1) a clinical evaluation of the carotid clamping and declamping repercussions,2) an optimal control of the respiratory parameters in normally and in emergency conditions,3) an easy conversion to general anesthesia and vice versa,4) a good analgesia,5) an unlimited duration of anesthesia.

The procedure is interesting provided it is performed according to a strict protocol, with continuous clinical and instrumental monitoring of the patient's status. The use of the conscious sedation under remifentanil seems to provide adequate comfort to the patient and enables the surgeon to operate in safety and tranquillity.

References

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Tab 1. Peri-operative variables

Duration of surgery (mean)	107 min
Duration of carotid clamping (mean)	43 min
Stump pressure (mean)	59.7 mmHg (range 89-20)
No neurological deficit	69.5%
Restlessness	4%
Unconsciousness and/or arm plegia that disappeared with medical treatment	16%
Unconsciousness and/or arm plegia that disappeared with carotid shunt	5.5%
Intensive Care requirement	3.9%

Tab 2. Post-operative complications

Complication	N. patients	% of 1120 patients
Death	2	0.2
Stroke	12	1
Transient ischaemic attack	8	0.7
Neck ematoma, bleeding	11	1

SCA11

PREDICTORS OF PERI-OPERATIVE RED BLOOD CELL TRANSFUSION IN LUNG TRANSPLANTATION

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PURPOSE: We retrospectively reviewed the peri-operative packed red blood cell (PRBC) transfusion requirements for a recent series of cadaveric lung transplants at a single center. The purpose of the review was to identify any predictors of transfusion that could potentially be modified, in order to minimize transfusion requirements.

METHODS: The charts of single (n=28) or bilateral (n=199) lung recipients transplanted between December 2004 and December 2007 were reviewed. Patients who required simultaneous heart or liver transplant were excluded from analysis as were redo transplants. Variables examined included red blood cell requirements in the 72 hours after the start of surgery, type of transplant (single versus bilateral), gender, height, weight, body surface area (BSA), body mass index (BMI), patient diagnosis, the use of pre-operative steroids, pre-operative hemoglobin, initial systolic pulmonary artery (PA) pressure in the operating room, the need for cardiopulmonary bypass (CPB), and intra-operative temperature. Logistic regression analysis was used to determine predictors of any PRBC transfusion, or of massive transfusion defined as > 5 units PRBC.

RESULTS: Of 240 charts reviewed, 227 were included in our analysis. Of these, 82% received PRBCs and 45% received a massive transfusion. Predictors of massive transfusion included: height < 168cm ($p=0.0046$), BSA < 1.85 ($p=0.04$), female gender ($p=0.02$), pre-operative hemoglobin < 130mg/L ($p=0.001$), initial PA >50mmHg ($p<0.0001$), and CPB ($p<0.0001$). There was a non-statistically significant trend associating double lung transplants with massive transfusion. While not predictive of massive transfusion, double lung transplantation ($p<0.0001$) and weight <70kg ($p=0.003$) were predictive of patients receiving a PRBC transfusion. Pre-operative steroid use and intra-operative temperature <35º;C did not impact blood usage.

CONCLUSIONS: Important predictors of PRBC requirements in lung transplantation include preoperative hemoglobin, parameters reflective of body size (height, weight, BSA, and female gender) initial systolic PA pressure and the need for CPB. These significant predictors are difficult to modify in patients where the timing of surgery is unpredictable.

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SCA12

VALIDATION OF A CLINICAL RISK PREDICTION SCORE OF THE LIKELIHOOD TO BENEFIT FROM CARDIAC TESTING AND CORONARY REVASCULARIZATION BEFORE MAJOR VASCULAR SURGERY

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BACKGROUNDS AND GOALS: Lee's Revised Cardiac Risk Index (RCRI)1 is currently the most accepted model for predicting cardiac outcome after major surgery. We aimed to validate a newly developed Long-Term Survival Score (LTSS)2 in predicting early to intermediate (6-months to 3 years) mortality following major vascular surgery and to compare it to the RCRI.

METHODS: In 624 consecutive patients undergoing major vascular surgery between 1990 and 2002 in Hadassah Medical Center, all preoperative clinical predictors, including preoperative 12-lead ECG were collected and correlated with long-term (3-15 years) survival data using Cox multivariate survival analysis. Seven predictors: age ³65, diabetes, cerebrovascular disease, ischemic heart disease, congestive heart failure, ST-depression on preoperative ECG and renal insufficiency independently determined long-term survival. A Long-Term Survival Score (LTSS) comprised of these 7 predictors was derived.

Additional 296 patients who underwent major vascular surgery in Beth-Israel Deaconess Hospital during 2001-2003 were collected to serve as a validation group. The sensitivity-specificity ratio of LTSS in predicting 6-months to 3-years mortality was tested in both the derivation and validation groups and was compared with Lee's RCRI by using ROC curve analyses.

RESULTS AND DISCUSSION: The area under the ROC curve of LTSS compared with RCRI was 0.67 vs. 0.56 ($p = 0.026$) in the derivation group and 0.61 vs. 0.53 ($p = 0.034$) for predicting 6-months mortality. The area under the ROC curve of LTSS compared with RCRI was 0.68 vs. 0.59 ($p < 0.001$) in the derivation group and 0.63 vs. 0.71 ($p = 0.005$) for predicting 3-years mortality.

CONCLUSIONS: LTSS is a better predictor than RCRI for predicting 6-months to 3-years mortality after major vascular surgery.

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1. Lee TH et al. Derivation and prospective validation of a simple index for prediction of cardiac risk of major noncardiac surgery. Circulation.1999; 100:1043-9

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	Mortality	RCRI AUC ± SE [95% CI]	eRCRI AUC ± SE [95% CI]	Area difference eRCRI-RCRI AUC [95% CI]	Test of equality of AUC's (Chi-sq.)	P value for the difference between AUC's
Derivation group (HMC)	**6-months**	0.56 ± 0.05 [0.46 – 0.66]	0.67 ± 0.04 [0.59 – 0.75]	0.11 [0.039 – 0.18]	9.06	0.026
	1-year	0.57 ± 0.04 [0.49 – 0.65]	0.65 ± 0.03 [0.58 – 0.72]	0.07 [0.016 – 0.13]	6.2	0.012
	2-years	0.59 ± 0.03 [0.53 – 0.66]	0.68 ± 0.03 [0.62 – 0.74]	0.08 [0.04 – 0.13]	13.7	0.0002
	3-years	0.59 ± 0.03 [0.53 – 0.65]	0.68 ± 0.02 [0.63 – 0.73]	0.09 [0.05 – 0.13]	21.6	< 0.0001
Validation group (BID)	**6-months**	0.53 ± 0.06 [0.41 – 0.64]	0.61 ±0.06 [0.48 – 0.73]	0.08 [0.006 – 0.15]	4.5	0.034
	1-year	0.61 ±0.04 [0.52 – 0.70[	0.68 ± 0.04 [0.60 – 0.76]	0.067 [0.014 – 0.12]	6.2	0.012
	2-years	0.60 ± 0.04 [0.52 – 0.67]	0.68 ± 0.03 [0.61 – 0.75]	0.079 [0.03 – 0.13]	10.8	0.001
	3-years	0.63 ± 0.03 [0.56 – 0.69]	0.71 ± 0.03 [0.64 – 0.77]	0.078 [0.03 – 0.12]	12.0	0.005