**CRITICAL CARE**

**Paper No: 65.00**

**Do sedation and neuromuscular blockade influence the outcome of adult intensive care patients? – a prospective observational study**  
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**Introduction:** Sedatives, analgesics, and neuromuscular blocking agents (NMBA) are commonly used in the intensive care unit (ICU) to provide patient comfort. More efficient utilization of these drugs is vitally important to prevent morbidity in ICU patients. There can be prolongation of mechanical ventilation attributable to these drugs, leading to increased duration of ICU stay and cost of hospitalization. Currently, minimal sedation or interruption is advocated. Hence this paradigm should be studied in every setting.  
**Objectives:** To investigate the pattern of sedation, analgesia and neuromuscular blockade in adult ICU patients and determine its influence on patient outcomes.  
**Methods:** A prospective observational study was conducted on patients admitted to an adult ICU over the period of six months. Data including age, gender, diagnoses, the type of sedatives, analgesics and neuromuscular blocking agents, route of administration, dosage, duration of mechanical ventilation, admission and weaning sedation scores, ICU length of stay and outcomes were recorded and compared between patients with and without neuromuscular blockade.  
**Results:** 1550 patient-days were studied from 140 mechanically ventilated patients. 55% were male. The median age was 47 years (interquartile range: 32–60). Sepsis was the most common diagnosis. 3.6% did not receive any form of sedation, analgesia and neuromuscular blockade. The most common drugs used were midazolam (93.6%), morphine (64%), fentanyl (35%) and cis-atracurium (37%). Age, length of stay, duration of mechanical ventilation, admission and weaning sedation scores were not different between patients who did and did not receive NMBA. Weaning sedation score was a good predictor of survival - area under the ROC curve: 0.94 (95% CI: 0.89, 0.98) (p < 0.001). Kaplan-Meier curves showed that although patients without neuromuscular blockade had a better survival at 30 days, this was not significant (Log rank p = 0.18).  
**Conclusion:** Neuromuscular blockade did not significantly impact on the duration of mechanical ventilation, length of stay and overall outcome of adult ICU patients.

**References**

**Paper No: 158.00**

**Enteral feeding should not be taken lightly in head injured patients**  
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**Introduction:** Benefits of early enteral feeding (EN) after head trauma (HT) is well established. These include fewer infections, trend towards better survival and disability outcomes in these hypercatabolic patients. Our busy neurosurgical intensive care unit (NICU) has no established regimen of feeding, relying on individual staff’s preferences.  
**Objectives:** To establish a feeding regimen in intubated HT patients, our study sought to determine timeliness, adequacy of EN provided in NICU and to identify barriers to effective EN.  
**Methods:** With IRB approval, this prospective observational study enrolled all intubated patients with isolated HT admitted to the NICU. Data on the provision of EN (Ensure TM) via nasal / orogastric tube feeding was collected until extubation or for 7 days. A dietician assisted with analyzing the type, amount of EN. Estimated requirements based on the Harris-Benedict equation with adjustments for diagnoses and comorbidities for each patient was calculated. Frequency and causes of feeds interruption were identified.  
**Results:** 24 consecutive eligible patients were recruited over 10 months. EN was commenced within 24 hours of NICU admission in only 8.3% of patients and within 48 hours in 67%. After initiation of feeds, patients received a mean of 59.9 ± 24.9 kcal and 50.0 ± 21.8% of their recommended caloric and protein intakes respectively. 68% of patients had episodes of feeds interruption exceeding 6hrs, of which the most frequent causes were fasting prior to extubation (52%), gastrointestinal intolerance (19%) and fasting prior to surgery or procedures (14%).

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Discussion: Head injured patients are known to have hypoa-
bulbinaemia which may negatively impact brain swelling and
intracranial pressure. Albumin level of our patients post
–extubation was inconclusive though all were below
normal. Patients did not get differentiated caloric supply
according to GCS score. The disappointing trend from this
study showed that only 8.3% and 67% of intubated HT
patients were commenced on EN within 24 and 48 hours
respectively with caloric and protein provision falling far
short of recommended values, contributed by inadequate
nutritional targets and frequent feeds interruptions.

Conclusion: Early nutrition in adequate amount is associated
with significant reduction in 2 week mortality and is an easy
therapeutic intervention that affects outcome. These results
proved a wake-up call for our NICU. A Nutrition Workgroup
to implement feeding targets will be established. Early enteral
feeding protocols, frequent dietician input and reminder
posters for clinicians have been proposed and a repeat
study planned. Caloric intake according to GCS score is
considered.

Reference
1. Effect of early nutrition on deaths due to severe traumatic brain
    injury. Hartl Roger, Gerber Linda, Ni QuanHong, Ghajarj Jamshid

Paper No: 239.00

Influence of epidural anesthesia on the
disorders hemocoagulation and quantity of
septic complications at patients with acute
necrotizing pancreatitis

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Introduction: According to many authors, the acute necrotizi-
ing pancreatitis (ANP) still remains one of the difficult
problems of abdominal surgery. The complexity of the patho-
genesis of the disease, features of the pancreas pathomor-
phology, abdominal hypertension, high mortality (30–70%),
necessitate search for new ways to treat this disease.

Methods: The study was conducted in 44 patients with the
ANP, which were divided into 2 groups according to type of
analgesia: epidural or opioids. Patients from 1st group (23)
had epidural analgesia by ropivacaine 6–14 mg/hour during
7–10 days, and from 2nd (21) – opioid analgesia by trime-
peridine 20 mg 3 times a day during the same period. We
monitored level of septic and thrombo-hemorrhagic

complications by clinical and instrumental data, during
month after treatment starting. The hemostatic system
was evaluated using indicators of hemoviscoelastography
(Analyzer “Mednord-01M”).

Results: It was found that all patients with ANP initially have
hypercoagulation and fibrinolysis inhibition. Level of hemo-
static disorders correlate with the level of septic complica-
tions, treatment in ICU, mortality. In 1st group we noted a
deep vein thrombosis (DVT), 2 pneumonia, 7 - pseudopan-
creatic cysts and abscesses, 2 deaths and time of stay in the
ICU to 15.4 days. In the 2nd group: 3 cases of deep
vein thrombosis, 4 - pneumonia, 10 - pseudopancreatic
cysts and abscesses, 2 episodes of gastro-duodenal bleeding,
5 deaths and time of stay in the ICU to 27.8 days.

Conclusions: The using of epidural anesthesia in patients
with ANP reduced the number of septic complications on
36.6%, and reduce the mortality rate from 23.8% (2nd gr.)
to 8.7% (1st gr.). We think, that violations of blood coagula-
tion and microcirculation are the basis for ischemia, necrosis
in tissues and septic complications. Epidural analgesia is ef-
fective method to decreasing level of septic and thrombo-
hemorrhagic complications and mortality in ANP patients.

Paper No: 286.00

Angiogenic factors and their soluble
receptors for predicting organ dysfunction
in disseminated intravascular coagulation
associated with sepsis

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Introduction: Disseminated intravascular coagulation (DIC)
precipitated by sepsis is characterized by capillary leak and
multiple organ dysfunction syndrome (MODS). Angiogenic
factors and their soluble receptors regulate vascular quies-
cence and permeability as a result of the balance of their
expression levels.

Objectives: We studied 1) the relationships between angio-
genic factors, their soluble receptors and organ dysfunction and
2) the effects of DIC-induced platelet consumption,
thrombin generation and tissue hypoxia on the expression of
the factors and receptors.

Methods: Fifty patients with sepsis were classified into two
subgroups: 37 patients with DIC and 13 patients without DIC.

Results: DIC patients showed higher Sequential Organ Failure
Assessment (SOFA) scores, the prevalence of MODS, and
more increased soluble fibrin and lactate levels. We observed
lower levels of vascular endothelial growth factor (VEGF),
soluble VEGF receptor 2 (sVEGFR2), angiopoietin 1 (Ang1)
and Ang1/Ang2, and higher sVEGFR1 and Ang2 levels in
DIC patients, but not significant differences in sTie2
expression during the study period. The levels of VEGF, sVEGFR1, and Ang2 were correlated with the SOFA scores. In particular, Ang2 was an independent predictor of an increase in the SOFA score, MODS, and a poor outcome in DIC patients. The VEGF levels showed a marked correlation with the platelet counts. Soluble fibrin and lactate levels independently predicted increases in the levels of sVEGFR1 and Ang2 in DIC patients.

Conclusions: VEGF, sVEGFR1, Ang2, and Ang1/Ang2, in particular Ang2, have important roles in the development of MODS in DIC associated with sepsis. DIC-induced platelet consumption, tissue hypoxia and thrombin generation could in part explain the changes in VEGF, sVEGFR1, and Ang2.

Paper No: 311.00

Electrical burn: a burn unit experience of 24 years

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Introduction: Electrical burn injuries represent 3–9% of all patients treated in burns centres.[1] They are a challenging problem associated with high morbidity, mortality and serious functional and cosmetic sequelae. [1,2] Despite this, there are few longitudinal studies of these patients.

Objectives: The aim of this study is to characterize burn patients and their outcomes in a Burn Unit.

Methods: A descriptive retrospective analysis was conducted, using a 24 year record of 1467 patients admitted in the Unit.

Results: In this study, electrical burns represent 12.9% (189) of all admissions to the Burn Unit (1467). Male patients were the most affected (95.2%) with an average of 3.3 years old. Mean total body surface area (TBSA) burned percentage was 21.4% (range, 1–90%) and the most afflicted areas were the upper limbs (84.7%) and the head and neck (50.8%). Of all patients, 60.0% had third-degree burns, 4.2% (8) also had thermal burn and 5.3% (10) had other traumatic areas. High-voltage burns occurred in 17 (9.0%) cases and in 3 (1.6%) the burn was caused by a lightning. The hospital stayed ranged from a minimum of 1 day to a maximum of 96 days (mean 23.5 days) and 63.9% were discharged home after recovery. Two patients (1.1%) were readmitted after going to the ward and mortality was 4.2% (8).

Conclusion: The majority of electrical burn accidents occurs in young male patients and the most injured corporal areas are the limbs. Most burns are more serious than initially appear, with second and third-degree burns but without extensive TBSA burned (TBSA<30% in 75.6% of the patients). Our mortality rate (4.2%) is similar to other studies (3–5%) [1] and, like we expected, it was associated with increasing age and TBSA. For a TBSA>50% the mortality rate was 37.5%, and for a TBSA>70% the mortality ascended to 60.0%. There were no casualties in patients with additional injuries other than burn. The mortality of patients who suffered high-voltage burns was 11.8%, but the sample was too small (2 of 17 patients) to draw conclusions.

References

Paper No: 348.00

The Coagulopathy of Major Trauma and Massive Transfusion

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Introduction: Trauma is a serious global health problem. Approximately 40% of trauma deaths are attributed to or caused by coagulopathy and bleeding after severe injury. The combination of acidosis, hyperthermia and coagulopathy has been labelled the triad of death, and it is very important in viscous cycle of haemorrhage, resuscitation, hemodilution, coagulopathy and continued bleeding.

Objectives: We want to prove how much massive transfusion correct coagulopathy in trauma patient.

Methods: Prospective data were collected on 50 patients with severe trauma, admitted to the SICU University Hospital Banjaluka, Bosnia and Herzegovina, over 36 months period, from January 2005 to December 2008. The patients with brain injury were excluded. Red blood cells(RBC), Hemoglobin(Hb), Platelet concentration, prothrombin time(PT), Activated partial thromboplastin time(APTT), fibrinogen and Thromboelastography (TEG) were determined on admission, after 12 hours and after 24 hours.

Result: The mean age of the study group was 46±30, the mean APACHE score was 20±5, 64% were male, and 38% died. The patient were transfused mean 5038 ml (20 unit) RBC, 3589 ml (1 unit) FFP (fresh frozen plasma), cristaloid 7078 ml and colloid 607,14 ml. Mean RBC on admission were 3589 ml (14 unit) FFP (fresh frozen plasma), cristaloid 7078 ml and colloid 607,14 ml. Mean RBC on admission were 2,57, after 12 hours 2,43 and after 24 hours 2,66. Hb values were 81,10 after 12 hours 77,72 and after 24 hours 81,36. Platelet number on admission were 155,46, after 12 hours 70,39 ml and colloid 607,14 ml. Mean RBC on admission were 3589 ml (14 unit) FFP (fresh frozen plasma), cristaloid 7078 ml and colloid 607,14 ml. Mean RBC on admission were 2,57, after 12 hours 2,43 and after 24 hours 2,66. Hb values were 81,10 after 12 hours 77,72 and after 24 hours 81,36. Platelet number on admission were 155,46, after 12 hours 70,39 ml and colloid 607,14 ml. Mean RBC on admission were 3589 ml (14 unit) FFP (fresh frozen plasma), cristaloid 7078 ml and colloid 607,14 ml. Mean RBC on admission were 2,57, after 12 hours 2,43 and after 24 hours 2,66. Hb values were 81,10 after 12 hours 77,72 and after 24 hours 81,36. Platelet number on admission were 155,46, after 12 hours 70,39 ml and colloid 607,14 ml. Mean RBC on admission were 3589 ml (14 unit) FFP (fresh frozen plasma), cristaloid 7078 ml and colloid 607,14 ml. Mean RBC on admission were 2,57, after 12 hours 2,43 and after 24 hours 2,66. Hb values were 81,10 after 12 hours 77,72 and after 24 hours 81,36. Platelet number on admission were 155,46, after 12 hours 70,39 ml and colloid 607,14 ml. Mean RBC on admission were 3589 ml (14 unit) FFP (fresh frozen plasma), cristaloid 7078 ml and colloid 607,14 ml. Mean RBC on admission were 2,57, after 12 hours 2,43 and after 24 hours 2,66. Hb values were 81,10 after 12 hours 77,72 and after 24 hours 81,36. Platelet number on admission were 155,46, after 12 hours 70,39 ml and colloid 607,14 ml. Mean RBC on admission were 3589 ml (14 unit) FFP (fresh frozen plasma), cristaloid 7078 ml and colloid 607,14 ml. Mean RBC on admission were 2,57, after 12 hours 2,43 and after 24 hours 2,66. Hb values were 81,10 after 12 hours 77,72 and after 24 hours 81,36. Platelet number on admission were 155,46, after 12 hours 70,39 ml and colloid 607,14 ml. Mean RBC on admission were 3589 ml (14 unit) FFP (fresh frozen plasma), cristaloid 7078 ml and colloid 607,14 ml. Mean RBC on admission were 2,57, after 12 hours 2,43 and after 24 hours 2,66. Hb values were 81,10 after 12 hours 77,72 and after 24 hours 81,36. Platelet number on admission were 155,46, after 12 hours 70,39 ml and colloid 607,14 ml. Mean RBC on admission were 3589 ml (14 unit) FFP (fresh frozen plasma), cristaloid 7078 ml and colloid 607,14 ml. Mean RBC on admission were 2,57, after 12 hours 2,43 and after 24 hours 2,66. Hb values were 81,10 after 12 hours 77,72 and after 24 hours 81,36. Platelet number on admission were 155,46, after 12 hours 70,39 ml and colloid 607,14 ml. Mean RBC on admission were 3589 ml (14 unit) FFP (fresh frozen plasma), cristaloid 7078 ml and colloid 607,14 ml. Mean RBC on admission were 2,57, after 12 hours 2,43 and after 24 hours 2,66. Hb values were 81,10 after 12 hours 77,72 and after 24 hours 81,36. Platelet number on admission were 155,46, after 12 hours 70,39 ml and colloid 607,14 ml. Mean RBC on admission were 3589 ml (14 unit) FFP (fresh frozen plasma), cristaloid 7078 ml and colloid 607,14 ml. Mean RBC on admission were 2,57, after 12 hours 2,43 and after 24 hours 2,66. Hb values were 81,10 after 12 hours 77,72 and after 24 hours 81,36. Platelet number on admission were 155,46, after 12 hours 70,39 ml and colloid 607,14 ml.
Guidelines defining hypothermia as a core temperature. The Institute of Clinical Excellence (NICE) recently published guidelines. In the UK, the National Institute of Clinical Excellence (NICE) recently published guidelines defining hypothermia amongst patients admitted to our general ICU is alarming high. In the UK, the National Institute of Clinical Excellence (NICE) recently published guidelines1 defining hypothermia as a core temperature below 36°C. NICE advocates that all patients should not be discharged from the recovery area to the ward if hypothermic and they should have their temperature monitored whilst back on the ward. If found to be hypothermic, forced air warming devices should be applied.

**Objectives:** We aimed to assess the incidence of inadvertent hypothermia amongst patients admitted to our general ICU and audit our compliance with published UK guidelines.

**Methods:** We conducted a retrospective analysis on all patients admitted to the ICU in Queen Alexandra Hospital, Portsmouth, United Kingdom from January to June 2010. Temperature measurements were recorded on admission to the ICU and throughout the duration of their admission. Patients who were being cooled for therapeutic reasons were excluded from the analysis.

**Results:** Of the 573 patients admitted to the ICU during the 6 month period, 186 patients had at least one incident of inadvertent hypothermia. These patients comprised: 140 emergency admissions, 20 post scheduled surgery admission and 26 post unscheduled surgery admissions. Overall incidence of inadvertent hypothermia was 32.4%. Only 18.8% of hypothermic patients had documented use of a warming device.

**Conclusions:** Inadvertent perioperative hypothermia is a common but preventable complication which is associated with poor outcomes for patients. This must be differentiated from therapeutic hypothermia where a lowered core temperature is induced to improve patient outcome in conditions such as out-of-hospital cardiac arrest. The quoted incidence of inadvertent hypothermia amongst ICU patients is high (>50%). Karapillai et al1 carried out a large retrospective audit of over 5000 patients and concluded that inadvertent hypothermia amongst ICU patients is not only common but also associated with increased patient mortality and morbidity. There was an increased incidence of cardiac events, bleeding, wound infection and longer hospital stay. The overall incidence of hypothermia on our ICU during the first half of 2010 was a surprisingly high 32.4%; 13.1% of patients had a temperature below 35°C. Following the publication of the NICE guidelines on hypothermia in 2008, this figure is a cause for concern.

**References**

Objectives: To measure prospectively the device-associated infection rates, ICU length of stay (LOS), mortality attributable to DAIs and quality of infections prevention, according to the INICC project.(2)

Material and methods: A 12 month (2010) surveillance of DAIs was conducted in new 25-bed ICU in University Hospital, Wroclaw, Poland. The definitions of Centers for Disease Control and Prevention, National Nosocomial Surveillance System were used and site-specific DAI rate were calculated. The actual data were compared with the results from the same institution obtained during the period 2007 - 2010 in the old 15-bed ICU.(3)

Results: During 1 year surveillance 444 patients acquired 126 DAIs (28,4%). The most common infection was ventilator-associated pneumonia (VAP) - 53% than catheter-associated urinary tract infection (CAUTI) - 30% and catheter-related bloodstream infection (CLABSI) - 17%. The rate of VAP was13.1 per 1000 device-days (old ICU 18,2), CAUTI 6.2 per 1000 device-days (old ICU 4,0) and CLABSI 2.9 per 1000 device-days (old ICU 4,8). The DAIs prolonged hospitalization in the ICU for 41 days. The extra mortality was 43% for CLABSI. Hand washing compliance was; physician - 60%, nurses - 49%. No marked changes of hand washing compliance by work shift were observed.

Conclusions: The DAI rate data from 2010 are lower than observed during the earlier study in the same institution, but still higher than reported by the NISS. The implementation of guidelines based on INICC network reduced the DAIs rate and improved the safety of ICU patients. Such approach should become a routine in all ICUs in Poland.

References

Paper No: 392.00

Biological markers of nutritional status in surgical intensive care units
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Introduction: It is established that malnutrition is an independent factor of morbidity and mortality in patients at ICU. The prognostic inflammatory and nutritional index (PINI) is frequently used as a marker of malnutrition but this scoring system was not studied in surgical intensive care units. Aim of the study: Assessment of nutritional status with biomarkers and search for a correlation between biological markers and prognosis, using the PINI.

Methods: An open prospective study was performed in the intensive care unit, started in July 2010. Twenty surgical patients aged from 18 to 80 years, spent at least seven days at the ICU were enrolled. An early nutritional care was given (first 24 hours). The patients were evaluated each week clinically (weight, BMI, MODS ratio…) and biologically (Albumin, Prealbumin, Orosomucoid, CRP measurements) in order to establish the prognostic inflammatory and nutritional index (PINI = CRP*oroso/ALB*preALB).

Results: The average age was 56 +/- 11 years, IGS II score was 48 +/- 7, APACHE II score was 25 +/- 12 and MODS ratio was 6 +/- 4. The mean duration of stay was 40 +/- 25 days; the mortality rate was 35%. The average calorie intake was 2300 +/- 600 kcal. There was a weight gain and an increase of the BMI either in surviving and dead patients. There was an initial increase of the CRP and the orosomucoid rate during the acute phase of aggression followed by a progressive decrease. The nutritional proteins (albumin,prealbumin,RPB) were always low, despite a progressive increase. The PINI was initially high and decreased progressively but remained high (> 20). The Albumin and Prealbumin rate were correlated with the MODS ratio respectively (p = 0.012; r = -0.822), (p = 0.045; r = -0.465). There was a correlation between the orosomucoid rate and the organ failure (p = 0.043; r = 0.681). The PINI was correlated to the MODS ratio and to the IGS II with respectively (p = 0.001; r = 0.681); (p = 0.045; r = 0.677) but not with mortality.

Conclusion: The malnutrition in surgical patients at ICU has an early onset and is always severe. Biological markers and IPNI are correlated with organ failure but not mortality.

Paper No: 428.00

Nutrition in Traumatic Brain Injured Patients A Prospective Audit
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Introduction:
- Patients with traumatic brain injury (TBI) have an increased calorie requirement. Guidelines suggest that patients should be fed to full requirement within 7 days of the injury. A reduction of 10 kcal/kg in calorie intake increases mortality by 30–40%.
- A recent Cochrane review shows improved survival and reduced disability with early feeding.
Objectives:
- To evaluate nutrition of TBI patients on our unit

Methods:
- Prospective audit of patients with traumatic brain injury admitted to NICU over a period of 4 months
- Patients who were ventilated for less than 72 hours or died within 72 hours of admission were excluded.

Results:
Total number of patients
17 (14 males, 3 females)
Age range 17-75 years
Total number of ventilated days 358 Level of ICP management required Level 1 (sedated) 7/17(41%) Level 2 (paralysis/cooling) 5/17(29.5%) Level 3 (decompressive craniectomy) 5/17 (29.5%) Time to haemodynamic stability 0 - 24 hrs 15/17(88%) 48 hrs 2/17(12%)
- Total number of ventilated days (12%)
- Average length of stay 20.7 days (range 8–62 days)
- Average GCS on admission 6 (range 3–14)

Reasons for shortfall Not absorbing (16.2%) Operation / X ray (9.5%) Extubation (3.1%) Tracheostomy (1.1%) No gastric tube (0.8%) Transfer (0.2%) Hypernatraemia (0.2%) NG Phenytoin (0.2%)
Reason for shortfall recorded in 31% cases

Conclusions: This audit indicates that the majority of our patients are not achieving full feed within the recommended time frame.
Strategies to improve nutritional input need to be considered, including increased awareness of the importance of nutrition in TBI patients, access to dieticians, and early insertion of jejunal tubes.

References

Morbi-mortality in acutely poisoned comatose patients related to aspiration pneumonia
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Introduction: Acutely poisoned comatose patients exhibit a high risk of aspiration pneumonia (AP). Morbidity related to AP is not well known. We evaluated the association between AP and the morbi-mortality in patients with acute poisoning requiring mechanical ventilation.

Methods: Ancillary study of the randomized controlled multicenter “KETASED” trial that compared the morbidity after a single dose of etomidate (0.3 mg/kg) versus ketamine (2 mg/kg) used for emergency rapid sequence intubation (ClinicalTrials.gov number, NCT00440102). All adult patients necessitating intubation were included (n = 650). Patients in cardiac arrest were excluded. AP was defined by either witnessed aspiration during intubation and/or pneumonia occurring within 48h following ICU hospitalization on pulmonary radiography or biological findings suggestive of pneumonia. Morbidity variables and mortality were recorded until day 28 of ICU hospitalization. The primary end-point was the maximum value of Sequential Organ Failure Assessment score (SOFAmax) during the first in-hospital 3 days. Results are given as means ± SD, medians and interquartile range or as numbers and percentages. The two groups were compared by the Wilcoxon test for quantitative variables and by either the chi-square or Fisher’s exact test for categorical variables.

Results: Among the initial 650 included patients, 197 patients (30%) were admitted because of acute poisoning. AP was found in 77/197 patients (39%). Baseline patient characteristics and intubation conditions did not differ between the two groups. The mean SOFAmax score between the two groups was significantly different (8 ± 3 for AP group vs. 6 ± 3 for non AP group; p = 0.0001), as well as the number of patients needing catecholamine (25 [33%] for AP group vs. 17 [14%], p = 0.002) and median [IQR] ventilator-free days (27 [24–27] for AP group vs. 27 [27–28], p < 0.0001) and median [IQR] ICU-free days (24 [21–26] for AP group vs. 26 [26–27], p < 0.0001). There was no significant difference in 28-day mortality (1 [1%] deaths in both groups).

Conclusions: Our results reveal that at day 28, aspiration pneumonia complicating comatose acute poisoning was associated with an important inhospital morbidity among
critically ill patients. However, mortality does not seem to be higher in these patients.

Paper No: 438.00

Ultra-fast-track anesthesia technique using high thoracic epidural catheter in patients undergoing cardiac surgery

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Introduction: An early extubation in cardiac surgery is an important aspect of fast-track cardiac anesthesia. It refers to extubation during 1–6 hours after the intervention, the extubation criteria being the same as for any other surgery. Immediate extubation is an extension of this concept, ultra-fast-track anesthesia, allowing the extubation of the patient in the operating theater.

Objectives: Report the routine application of a technique that allows immediate extubation in the majority of patients undergoing on-pump cardiac surgery using short-acting anesthetic and thoracic epidural analgesia.

Methods: Seven hundred and forty four patients (Age 15 to 89, mean 65.2 years) underwent schedule coronary (44%), valve (46%), combined surgery (10%) were included in a retrospective observational study of ultra-fast-track anesthesia with epidural anesthesia placed at T3-T4. The percentage of patients extubated at the end of the surgery after skin closure was the primary end point.

Results: Most of the patients (79%) were extubated successfully in the operating room at the end of the surgery, although 6% of them were intubated during the stay at the intensive care unit. There were significative difference in respiratory failure between immediate extubated a non-immediate extubated patients (7% and 20% respectively, p < 0.05), there were also significative difference in mortality rates (5.5% and 19.2% respectively, p < 0.05).

Conclusion: Ultra-fast-track anesthesia in cardiac surgery is feasible in most of the patient with epidural catheter and short-acting anesthetics. There were significative difference in respiratory failure and mortality between immediate and non-immediate extubated patient, although farther randomized prospective studies are needed.

Reference

Paper No: 503.00

Ultrasound guided central line catheterization: a randomized control trial

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Introduction: Even though ultrasound guided central catheterization has been proven to be effective (1), there is a lack of good quality evidence that analyzes the influence of expertise operator in the success of placement and complications.

Objective: Compare the rates of success and complications of central line placement in patients in ICU and under general anesthesia, with and without ultrasound. Analyze the influence of operator training ("E" experts and "NE" non experts) as well as anatomic neck difficulties in the ultrasound vs. non ultrasound technique.

Methods: We included 270 consecutive patients (160 in the expert “E” group and 110 in the non expert “NE” group). We randomly divided each group in technique with ultrasound (“U”) and without ultrasound ("NU"). 8 patients were discarded from the study, so 257 were analyzed: 80 patients in “E-NU” group, 72 in the “NE-U”, 54 in the “E-U” and 51 in the “NE-NU”.

Results: The incidence of success in the placement of central line was higher in the expert group (“E” = 88%vs."NE" = 79%; p = 0.04) and so does in the ultrasound guided group ("U" = 91%vs."NU" = 78%; p = 0.005). This better performance with ultrasound was demonstrated for both groups: “E” and “NE”.

Global incidence of complication was 11.7% and most of them were Carotid punctures. In the group of experts (“E”) there were no differences in complications with or without ultrasound (7%vs.8.5%), but there were differences in the "NE" group: “U”: 7.8%vs."NU"24% (p = 0.03).

In 65 necks considered “difficult”, the “E” group had a high rate of success with ultrasound than without it: 92.6%vs.65% (p = 0.049). The success rate was not different for “NE” group with or without ultrasound (79%VS.71%). No differences in complication were registered related to the type of neck in any group.

Conclusions: Ultrasound guided placement of central lines improves success and diminishes complications mainly in
non trained Doctors. Ultrasound must be available in all training centers.

Reference

Paper No: 524.00
Cost effective blood transfusion in the intensive care unit
Manu-Priya Sharma and Peter Anderson
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Introduction: Red blood cell (RBC) transfusion is common in critically ill patients and the most frequent indication for transfusion is critical care-associated anaemia (1). There is little evidence to support the efficacy of RBC transfusion in haemodynamically stable critically ill patients with a low haemoglobin (Hb). Recently there has been growing recognition that transfusion-related complications, such as transfusion-related infections may be associated with worse clinical outcomes.

In 2009 a Clinical Practice Guideline regarding blood transfusion in critically ill patients was published in Critical Care Medicine (2) based upon the best available evidence. The Guideline recommends that in the absence of acute haemorrhage or acute coronary syndrome, RBC transfusion should only be considered if the Hb ≥ 7g/dl.

Objectives: Our Critical Care Unit does not have a protocol trigger for the transfusion of RBCs and practice may vary between Consultants. We retrospectively reviewed our blood transfusion practice against the new Clinical Practice Guideline and performed a cost analysis.

Methods: Sample population: All patients on the Critical Care Unit who had received RBC transfusions between 1st January - 1st July 2010 were identified from our Clinical Information System (Metavision, iMDsoft, Tel Aviv). Excluded: Those actively haemorrhaging Of these patients, 37 were randomly selected for in-depth review.

Each episode of RBC transfusion was correlated with the laboratory-measured haemoglobin concentration immediately before transfusion. Each episode of blood transfusion was classified as ‘appropriate’ (Hb ≥ 7g/dl) or ‘inappropriate’ (Hb <7g/dl). The ‘inappropriate’ group was further subdivided to include a ‘borderline’ group (Hb 7-8g/dl). The costs of RBC transfusions were calculated using a cost per unit of £124.21 (price at the time of the study).

Results: 139 patients received non-urgent blood transfusions, a total of 380 units. The 37 patients selected for in-depth review accounted for 67 episodes, a 141 units, at a cost of £17,513.61. Of the 67 episodes, 21 (31%) were ‘appropriate’, 33 (49%) were ‘borderline’ and 13 (20%) were inappropriate, in accordance to the published Guidelines.

Conclusions: Assuming that the patients reviewed give an accurate reflection of our department blood transfusion practice. If blood had been given when the haemoglobin was <8g/dl the cost would have been £14,010.88. If as per published Guideline blood was given when the haemoglobin was ≥ 7g/dl the cost would have been £5,429.22, a cost saving of 69% If extrapolated to include all patients who received non-urgent blood transfusion in the six month period concerned, the cost saving would have been £32,567.

References

Paper No: 525.00
Unplanned admission to ICU/HDU: a 10 year review
Frank Schneider1, Ben Mensah2 and Stanislav Jankowski2
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Introduction: Unplanned Intensive Care Admissions (UIAs) often result from preventable incidents, which result in increased morbidity and length of stay. As they can result from complications of patient care, they are a useful clinical indicator for patient safety measurements, as well as surgical and anaesthesia-related morbidity and mortality.(1,2) The largest contribution to anaesthetic morbidity is related to airway complications, of particular relevance in light of the recent Royal College of Anaesthetist’s 4th National Audit Project (NAP4) on major complications of airway management in the United Kingdom. (3,4)

Objectives: To review all cases of anaesthetic-related UIAs from 2000 to 2009. In addition, to identify and highlight any pre-morbid risk factors, at-risk groups and procedural factors that predispose to UIAs.

Methods: This prospective survey was performed at St. Helier Hospital Intensive Care Unit (ICU) and High Dependency Unit (HDU) over a 10 year period from January 2000 to August 2009. Data collected included demographic characteristics, pre-operative co-morbidities, American Society of Anesthesiologists (ASA) physical status classification, procedure details, urgency and timing of surgery. The phase of anaesthesia and grade of anaesthetist was recorded. The reason for admission, location of admission (ICU or HDU) and severity of illness scores for ICU admissions (APACHE II) were also recorded. UIA patients were identified as those who were not...
scheduled for postoperative admission to ICU/HDU at the beginning of the procedure.

**Results:** A total of 117 cases were identified, and patient demographics followed a normal distribution; smoking history (43%) and obesity (38%) were recorded. A greater percentage of general surgery and orthopaedic cases were involved than other surgical specialities. Most incidents leading to admission occurred in recovery (58/117), as opposed to upon induction (35/117) and in theatre (24/117). There were more HDU (63/117) than ICU (54/117) admissions, with higher ASA patients more likely to require ICU admission. Consultant or senior anaesthetists were involved in 76% of cases. Various respiratory complications accounted for the overwhelming number of cases (94/117), followed by drug-related (8/117), anaphylaxis (7/117) and others (8/117). Length of stay was usually less than 24–48 hours. with 16 cases requiring admission beyond 1 week.

**Conclusions:** Respiratory complications remain the biggest cause for UIAs, many of which are preventable. Our results were comparable with the literature and showed a decreasing trend in UIAs thought to be due to greater senior involvement as well as improved awareness of groups thought to be at risk (obesity, smokers, surgical categories).

**References**


**Paper No: 558.00**

**Use of surfactant in esophageal cancer surgery: a randomized, controlled pilot study with 20 patients**

**Introduction:** Esophageal cancer surgery usually involves a thoraco-abdominal approach. During the thoracic part of...
the surgical procedure, one-lung ventilation (OLV) is performed. OLV involves risk of ventilation-perfusion mismatch. Early postoperative restoration of deteriorated pulmonary function may be crucial for successful post-esophagectomy recovery.

**Objectives:** To investigate whether intraoperative use of diluted surfactant can reduce alveolar damage and thereby improve recovery from esophageal cancer surgery.

**Methods:** This prospective, randomized, controlled study was performed from April 2010 to March 2011 in the Department of Thoracic Surgery of University Hospital Centre Zagreb with 20 patients scheduled for esophageal cancer surgery. No patient had any known lung disease. After intubation with a double lumen tube, 10 patients received surfactant in the main bronchus of the dependent lung (1.5 ml of 120 mg surfactant diluted into 18.5 ml of saline). The other patients received 20 ml of saline solution. Several lung function parameters were measured preoperatively (time 0) and at 12, 24 and 48 h after surfactant application: inspired oxygen fraction (FiO2), oxygen saturation oxygen (SpO2), oxygen partial pressure in arterial blood (PaO2), and carbon dioxide partial pressure in arterial blood (PaCO2). Mean airway pressure (MAP) was measured at the same time points except 48 h, because by that time all patients had been extubated.

**Results:** Independent- and dependent-sample t-tests were performed to determine significant differences in mean values between study groups and between measurements, respectively. The two groups showed no significant differences in lung function at 0, 12 or 24 h after surfactant application. However, at 48 h, FiO2 was significantly lower in the group that received surfactant (0.27 ± 0.04 vs 0.40 ± 0.07, p < 0.05).

**Discussion:** The lack of significant differences in lung function between the two groups up to 24 h after surfactant application suggests that surfactant did not alter the effects of the surgery. Nevertheless, the surfactant group showed faster recovery: by 48 h after surfactant application, this group showed better oxygenation, reflected in constant SpO2 and decreasing FiO2.

**Conclusion:** Thus this pilot study suggests that surfactant application during esophagectomy may improve patient recovery. Further research on this question seems justified.

**References**


**Paper No: 592.00**

**The incidence and risk of acute kidney injury after myocardial revascularization**

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**Introduction:** Acute kidney injury (AKI) after cardiac surgery is associated with increased postoperative morbidity and mortality (1,2).

**Objectives:** We investigated the incidence of AKI after coronary artery bypass grafting (CABG) surgery using RIFLE (Risk, Injury, Failure, Loss, and End-stage kidney disease) criteria (3).

**Methods:** 95 consecutive patients (24 women, 71 men, mean age 68 years) following CABG procedures with 53 patients (55.8%) on-pump and 42 (44.2%) off-pump techniques were analyzed. Mean EuroSCORE was 4. 41 patients (43.1%) were older than 70, 19 (20.0%) had reduced (r<~50%) EF, 74 (77.9%) arterial hypertension, and 32 (33.6%) diabetes as risk factors of chronic renal damage preoperatively. Preexisting renal dysfunction (estimated glomerular filtration rate, eGFR r~70 mL/min) was present in 32 (33.7%) patients.

**Results:** AKI (d25% decrease in baseline eGFR within 1 week of surgery or need for renal replacement therapy) occurred in 24 (23.2%) patients, 9/53 (17.0%) in on-pump and 13/42 (31.0%) in off-pump group. 4 patients (2 in both groups) needed peritoneal dialysis. Of them, one patient operated on with acute myocardial infarction died on the second postoperative day from cardiogenic shock. 18 (75.0%) patients with AKI had renal dysfunction preoperatively. Low output state (need for d2 inotropic drug and/or insertion of intra-aortic balloon pump) developed in 10 (41.7%) patients. Red blood cells were transfused to 14 (58.3%) patients. Study mortality was 1.1%.

**Conclusions:** The incidence of AKI was higher in off-pump group, because of the prevalence of risk factors for the development of AKI in this group. Majority of AKI patients had renal dysfunction preoperatively. Strategies optimizing
perioperative care may prevent renal failure in patients with preexisting renal dysfunction.

References

Paper No: 593.00

Prognosis value of NT-pro-BNP, troponin I and procalcitonin in intensive care unit
Zied Hajjej, Hedi Gharsallah, Nizar Allouche, Imen Naas and Chihab Romdhani
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Introduction: The NT-pro-BNP and procalcitonin have been proposed by some authors as prognostic markers in ICU. This study aims to evaluate the prognostic value of NT-proBNP, troponin I (TnI) procalcitonin (PCT) and CRP with the outcome at Day 28.

Material and methods: Prospective study carried out in an intensive care unit during four years (2006–2010). The assays were performed on D0, D2 and D4.

Main Outcome: Mortality at day 28. The association between mortality at day 28 was made with the biological points of each biomarker and not patients.

Results: We included 275 patients. The 28-day mortality was 26.2%. There is a significant difference in levels of NT-pro-BNP, TnI and PCT between the dies and the survivors, but no differences in CRP. Determination of the cut off to predict mortality at day 28 was made by the ROC curves for NT-pro-BNP, TnI and PCT and they were respectively 800 pg / ml, 0.16 ng / ml and 0.87 ng / ml. The odds ratio were calculated for these thresholds: it is 3 (1.5 to 3.7) for NT-pro-BNP, 2 (1.3 to 3) for TnI and 1.9 (1.3 to 2.9) for PCT.

Conclusion: The elevated levels of NT-pro-BNP, TnI and PCT are correlated with increased mortality at day 28 in patients admitted to ICU regardless of patterns of admission. Biomarkers are a quick and relatively reliable for prognostic evaluation.

Reference

Paper No: 642.00

Informativeness of current markers of sepsis
Gayane Hakobyan and Magda Yeghiazaryan
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Introduction: Sepsis is one of the most dangerous infectious complication, early diagnosis of sepsis facilitates effective control of pathological process and reduces mortality.

Objectives: The aim of study was to analyse informativity of current markers of sepsis (procalcitonin, glucose, C-reactive protein, microbiological methods). The purpose was to improve current diagnosing of sepsis.

Methods: During 2004–2011 years 1589 patients were observed. 263(16.6%) patients (76.3% (n = 200) male and 23.7% (n = 63) female) had sepsis. Average age was 16–84 year (43.8±17.1). Days of hospitalizations were 18.1±18.8 (2–116 days); mortality- 33.8%; consciousness by Glasgow Coma Scale - 11,8±7.6 points: ABDANİ 11 was 14,3±6.9. Validity of markers was estimated using following statistician methods: sensitivity (Se,%), specificity (Sp,%), positive predictive value (PV+,%), negative predictive value (PV-,%), prevalence (P,%), positive likelihood ratio (LR+) negative likelihood ratio (LR-). The research have already finished.

Results: Data obtained that maximal Se had procalcitonin, and microbiological methods (100%) Se of cytokines were -91.3%, glucose-94.7%. High level of Sp typical for microbiological methods (57.9%) and C-reactive protein (n = 45.8%). Procalcitonin (28.9%), cytokines (28.1%) and glucose (27.8%) had low level of Sp. PV+ of microbiological methods (81.8%) and C-reactive protein (70.5%) were approximately two times more than PV+ of cytokines (47.7%), glucose (40.9%) and procalcitonin (38.6%). C-reactive protein, microbiological methods and procalcitonin had zero level of PV-. Cytokines had 18.2% and glucose 9.1% of PV-. The level of LR+ of cytokines(3.4), procalcitonin(3.6) and glucose(3.5) were in the same level. But LR+ of C-reactive protein(2.2), microbiological methods (1.8) were lower. Identically LR- of cytokines were 3.2, glucose and procalcitonin – 3.4, C-reactive protein - 2.2, microbiological methods - 1.7. Maximal level of P had microbiological methods (65%) and C-reactive protein (56%), minimal level -procalcitonin (31%). All statistic parameters showed that diagnosis of sepsis actual when microbiological methods (Sp = 57.9%; PV+ = 81.8%; P = 65%) and C-reactive protein (Sp = 45.8%; PV+ = 70.5%; P = 56%) were positive. Really negative result present in case of negative response of procalcitonin, C-reactive protein and microbiological methods (Sa = 100%; PV- = 0, respectively). LR+ of cytokines (3.4), procalcitonin (3.6) glucose (3.5) the most probably were positive in patients with sepsis. However, LR- negative result of C-reactive protein (2.2) and microbiological methods (1.7) were typical for healthy patients.

Results: After statistical analysis of obtained parameters only positive microbiological cultures (Sp = 57.9%; PV+ = 81.8%; LR+ = 2.4; P = 65%), diagnostically relevant levels of C-reactive protein (Sp = 45.8%; PV+ = 70.5%; LR+ = 1.9; P = 56%) and high white blood count (Sp = 90.9%; PV+ = 95.5%; LR+ = 5.3; ? = 80%) showed to be true positive results. True negative results were stated in case of negative levels of Procalcitonine (Sp = 100%; PV- = 0; LR- = 0; P = 31%), C-reactive Protein (Sp = 100%; PV- = 0; LR- = 0; P =
Introduction: The supplementation of fibrinogen with human fibrinogen concentrate may contribute to the successful management of major bleeding. (1-4)

Objectives: To evaluate the efficacy and safety of fibrinogen concentrate as first-line haemostatic therapy for the treatment of major bleeding during complex cardiovascular surgery.

Methods: This was a Phase II, prospective, randomised, double-blind, placebo-controlled study conducted at a single centre (Hannover Medical School, Hannover, Germany). Eligible patients were aged >18 years and undergoing complex cardiovascular surgery. Patients were randomised before surgery to receive fibrinogen concentrate or placebo at the end of cardiopulmonary bypass (CPB) in the event of clinically relevant bleeding. Clinically relevant bleeding was defined as a bleeding mass of between 60 g and 250 g into the surgical site within 5 minutes immediately after removal from CPB and completion of surgical haemostasis. The dose of fibrinogen concentrate was determined using the maximum clot firmness parameter of the FIBTEM test performed before the end of CPB. If clinically relevant bleeding continued after administration of fibrinogen concentrate or placebo, a standardised algorithm for transfusion of allogeneic blood products was followed until bleeding was controlled. The total transfusion requirements in the 24 hours following administration of fibrinogen concentrate or placebo were compared between treatment groups.

Results: The efficacy population comprised 60 patients (fibrinogen concentrate, n = 29; placebo, n = 31). The demographics and perioperative characteristics of the study population were similar between treatment groups. Patients who received fibrinogen concentrate were transfused with significantly fewer units of allogeneic blood products than those who received placebo (median 2.0 U (range 0–31) vs. 13.0 U (range 4–62), respectively; p < 0.0001). All patients in the placebo group required transfusion with allogeneic blood products to control their bleeding, whilst 45% (n = 13) of patients who received fibrinogen concentrate completely avoided the need for transfusion (p < 0.0001, Chi square test). Treatment-emergent adverse events (TEAEs) (fibrinogen concentrate: n = 24 [82.8%]; placebo: n = 27 [84.4%]) and serious adverse events (fibrinogen concentrate: n = 5 [17.2%]; placebo: n = 5 [15.6%]). The nature of TEAEs was typical for patients undergoing complex cardiac surgery.

Conclusions: Point-of-care guided administration of fibrinogen concentrate can be used to successfully control major bleeding in patients undergoing complex cardiovascular surgery, reducing the need for transfusion with allogeneic blood products. Further studies would be beneficial to establish fibrinogen concentrate as first-line haemostatic therapy in the management of major bleeding.

References

Paper No: 770.00

Ram’s jet ventilation for insertion of the montgomery t-tube in a patient with basilar artery syndrome: anaesthesia for tracheoplasty

Devsugker Ramchandra

Introduction: Long term tracheostomy can be associated with complications like mucosal inflammation, tracheal or superficial tissue pressure necrosis, ischaemia, tracheal collapse and tracheal stenosis. A soft silicone T-shaped tube (with an upward and downward laryngo-tracheal and an external lumen) was developed by William Montgomery for use after tracheoplasty instead of a tracheostomy tube and to overcome some of the harmful effects of tracheostomy tubes. Basilar Artery syndrome with quadriplegia can be an agonizing clinical condition and can require a long term artificial airway for suction and ventilation. In view of the mentioned complications of long term tracheostomy insertion of a Montgomery T-tube in exchange of tracheostomy tube has been advocated. The Montgomery T-tube acts as combined
tracheal stent and can be combined with devices for humidification and phonation. The sporadic use and unfamiliarity with Montgomery T-tube insertion and securing it safely within tracheal lumen requires specialized ear-nose and throat and anaesthetic personnel. Sharing the airway and anaesthetizing the patient for insertion of a Montgomery T-tube is challenging.

**Objectives:** Description of total intravenous anaesthesia and use of an ingenious jet ventilator developed by the author, the Ram’s Jet ventilator, in a case of tracheoplasty and change of a tracheostomy tube for a Montgomery T-tube in a patient with Basilar Artery Syndrome.

**Methods:** A 40 years male with quadriplegia due to Basilar Artery Syndrome who had had a tracheostomy tube for one and half years was scheduled for tracheoplasty. He was premedicated with i.v. 0.2mg. of glycopyrrolate and pre-oxygenated. Induction of anaesthesia was with 200mg. thio-pentone, 50 mcg fentanyl and 30mg atracurium. The maintenance of anaesthesia was with propofol infusion and titrated dose of atracurium.

The tracheostomy tube was removed and replaced with a 6.0mm internal diameter cuffed endotracheal tube. Jet ventilation was applied with a small 3.0mm catheter through the lumen of endotracheal tube. After tracheoplasty, the vertical lower limb of the lower tracheal part of the 12 size Montgomery T-tube was passed with 3mm catheter through the extra-tracheal lumen of the T-tube for jet ventilation. During insertion of upper laryngeal part of the tube, jet ventilation was interrupted for a short while to prevent barotrauma. Otherwise, ventilation was not a problem. After securing the tube in the tracheal lumen neuromuscular block was reversed with 2.5mg of neostigmine and 0.4mg of glycopyrrolate and the patient allowed to breath spontaneously.

**Results:** Total duration of Jet ventilation: 40 min. Vitals Minimum Maximum H.R 70/min 110/min. B.P 110/70mm Hg 140/90mm Hg SpO2 96% 99%.

**Conclusion:** Very few anaesthetic techniques have been described with simplicity and satisfaction in the management of insertion of Montgomery T-tube under anaesthesia with associated airway problems. In our case, we have used inexpensive local made jet ventilation and total intravenous anaesthesia without any problems.

**References**


**Paper No: 785.00**

**Graphical assessment of oxygen metabolism by lactate level and central venous oxygen saturation**

Kazumasa Tazawa, Hideki Miyao, Katsuo Terui, Tatsuya Fukuyama and Kaoru Koyama

**Introduction:** Whole body integral assessment of oxygen supply/demand has been investigated with central venous oxygen saturation (ScvO2). Lactate is produced via anaerobic glucose metabolism and can be used as a definitive metabolite. In theory, ScvO2 reflects whole body oxygen metabolism while lactate level reflects the condition of peripheral oxygen debt.

**Objectives:** The objective of this study was to propose a graphical assessment of oxygen metabolism using ScvO2 and lactate level, and to show the potential availability of this method using two cases with impaired oxygen metabolism.

**Methods:** The graph we propose is divided into four subset areas by lactate concentration (horizontal; cutoff 2 mmol/l); and ScvO2 (vertical; cutoff 70%). Left upper (subset I) is "normal" area. Left lower (subset II) is "unbalanced oxygen supply/demand". Right upper (subset III) is "hypoperfusion, and/or dysxia". Right lower (subset IV) is overlapped with subset II and III. The patient data were drawn into this graph during ICU stay.

**Results:** A 34-year-old female with connective tissue disease was suffering from severe hypotension of unknown cause. She had an extremely high lactate level (19.7 mmol/l) with borderline ScvO2 (68%) and was classified as subset IV at ICU admission. With catecholamine infusion, we initiated infused milrinone from 18h later and she moved into subset I 50h later. She finally recovered and was discharged from the ICU 4 days later.

A 96-year-old female undergone hip surgery was admitted to the ICU. Nurses could not recognize considerable post-operative bleeding because internal blood had not been drained into a drainage bag. ScvO2 decreased from 60% to 37%, lactate increased from 3.5 to 6 mmol/l, and hemoglobin decreased from 8.4 to 5.9 g/dl until 2h after ICU admission. After massive transfusion, she finally recovered and was discharged from the ICU.

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and other healthcare professionals. This method can be used for an educational tool for residents and medical students.

**Conclusion:** A two-dimensional, four-subset classification graph using lactate and ScvO2 can be a simple and useful tool to assess the complicated impaired oxygen metabolism.

**References**


**Paper No: 828.00**

**The Assessment of Intensive Care Unit Patient Relatives in Terms of Anxiety and Depression**

Zeynep Karaman, Ahmet Mahli and Demet Coskun

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**Objectives:** In our study, we aimed to determine the factors related to and the frequencies of anxiety and depression symptoms manifested in the relatives of intensive care patients by using Hospital Anxiety and Depression Scale (HADS).

**Methods:** A total of 150 of relatives over the age of 18 whose patients were hospitalized in Intensive Care Unit (ICU) over 48 hours were included in the study. Patients’ sociodemographic information (age, gender, marital status, education), reasons for ICU stay, hemodynamic parameters, and Glasgow Coma Score (GCS), Multiple Organ Dysfunction Score (MODS), Acute Physiology and Chronic Health Evaluation (APACHE) II score were recorded. Relatives were asked to fill in the questionnaire that included sociodemographic information (age, gender, marital status, education and work status), efficiency of information about the patient and HADS. When all clinical anxiety and depression data were assessed together; 76% of relatives showed symptoms of anxiety and 72.6% of relatives showed symptoms of depression. Women exhibited more depression and anxiety symptoms compared to men. Anxiety and depression symptoms were found in 67.8% and 66.7% of women, respectively. There were higher levels of anxiety and depression symptoms in spouses, parents, children and siblings compared to other relatives. Relatives with high APACHE II score had more anxiety and depression symptoms. Moreover, relatives with high MODS and low GCS had more depression symptoms. Relatives who were sufficiently informed compared to those who were not showed more anxiety symptoms at borderline.

**Conclusions:** Education level and previous ICU experience of patient relatives, their frequency of being informed and getting information from the same person did not affect anxiety and depression symptoms. More levels of anxiety was reported in the unemployed relatives compared to those employed, but there was no significant difference in depression frequency.

**References**


**Paper No: 844.00**

**The effects of recombinant human soluble thrombomodulin treatment in patients with peritonitis with disseminated intravascular coagulation**

Naoto Hori, Kentaro Takeda, Takeshi Ide, Yuichiro Ikedaq and Shinichi Nishi

Division of Intensive Care Unit, Hyogo College of Medicine

**Introduction:** Recombinant human soluble thrombomodulin (rTM) is expected to be effective in the treatment of disseminated intravascular coagulation (DIC). In Japan, rTM has been used commercially for the treatment of DIC since 2008. **Objectives:** We evaluated whether rTM is effective for the treatment of peritonitis in patients with DIC and whether rTM has a tendency to cause bleeding.

**Methods:** We performed a retrospective study in the intensive care unit (ICU) of the Hospital of Hyogo College of Medicine from January 2006 to December 2007 when rTM was not administered commercially (rTM administration period) and from May 2008 to September 2010 when rTM was administered commercially (rTM non-administration period). We collected the following data before treatment of DIC (day 0) and after treatment of DIC (day 7); the following parameters were considered for determining DIC: Japanese Association for Acute Medicine-defined DIC criteria score (JAAM DIC score), sequential organ failure assessment (SOFA) score,
length of ICU stay, length of hospital stay, and the volume of bleeding. Criteria of JAAM DIC are systematic inflammatory response syndrome criteria (score is from 0 to 1), platelet count (score is from 0 to 3), prothrombin time (value of patient/normal value) (score is from 0 to 1), fibrin/fibrinogen degradation products (score is from 0 to 3). JAAM DIC score is from 0 point to 8 points. The diagnoses of the DIC are more improved than four points.

**Results:** We treated 9 patients in the rTM non-administration period and 7 patients in the rTM administration period. The baseline characteristics were almost similar between the 2 groups. In the rTM non-administration group, the JAAM DIC score decreased from 4.6 (day 0) to 2.6 (day 7) (P = 0.55). In the rTM administration group, the JAAM DIC score decreased from 5.7 (day 0) to 1.9 (day 7) (P < 0.05). Thus, the rTM administration group showed more improved DIC than the rTM non-administration group. There was no significant difference in the volume of bleeding between both groups.

**Conclusions:** In the rTM administration group, the DIC scores improved significantly, suggesting that rTM could be effective for the treatment of DIC.

**References**


**Paper No: 855.00**

**Risks factors for biliary tract carriage of multidrug resistant Gram-negative bacilli in community patients**

Genaro Maggi, Emilio Maseda and Fernando Gilsanz

**Introduction:** There is little clinical information about community biliary tract carriage caused by multidrug resistant (MDR) Gram-negative bacilli. We investigated the prevalence and risk factors of MDR Gram-negative bacilli in bile sample obtained during cholecystectomy from asymptomatic patients with cholelithiasis from the community population.

**Methods:** Risk factors were assessed using a case-control-control study. To be classed as MDR, Gram-negative bacilli should be resistant to at least three antibiotic families. These isolates included extended-spectrum cephalosporin (ESC)-resistant Enterobacteriaceae and Pseudomonas aeruginosa resistant to ceftazidime. Statistical analysis was performed using Fisher’s exact test for categorical variables and T student test for continuous variables.

**Results:** We included 150 asymptomatic patients who underwent aspiration of bile during cholecystectomy due to cholelithiasis. The presence of MDR bacteria was low (3 of 150 patients, 2%). MDR were: extended-spectrum $\beta$-lactamase (ESBL)-producing Escherichia coli (1, 0.6%), ESBL-producing Klebsiella pneumoniae (1, 0.6%) and Pseudomonas aeruginosa resistant to ceftazidime (1, 0.6%). Comparison with both control groups disclosed association with previous endoscopic into the biliary tract procedures (p = 0.013).

**Conclusions:** Although rates of colonization by MDR Gram-negative bacilli (included ESBL-producing organisms) have increased dramatically worldwide and it is a public health concern among community patients our results suggest that it isn’t a problem in the biliary tract. Only patients with previous endoscopic procedures into biliary tract is associated with the presence of MDR bacteria. This result could help to improve the adequacy of empirical antibiotic therapy in patients from community population with a diagnosis of cholecystitis and/or cholangitis requiring admission to ICU.

**References**


**Paper No: 866.00**

**Emergency tracheal intubation of critically ill patients: anaesthesiology still required**

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**Introduction:** Tracheal intubation for emergency critically ill patients in the acute setting presents greater challenges than for those undergoing routine surgical anaesthesia. In the UK, anaesthetists perform the vast majority of emergency intubations. However, this is not reflected internationally, with separate critical care training programs and physicians thus inevitably exposed to less airway experience. Indeed the UK is following suit with the UK faculty of intensive care medicine and its training program.

**Objectives:** To determine the local incidence of difficult laryngoscopy (Cormack-Lehane grade III and IV) and complications arising during emergency intubation of critically ill patients who were not about to undergo surgery.

**Methods:** Information was gathered directly from the on-call anaesthesiologist following emergency intubation. Data collected included Cormack-Lehane laryngoscopy grade, complications from tracheal intubation and drugs used.
**Results:** Information on 86 non-cardiac arrest emergency intubations was collected over eight months. There were 11 (12.8%) intubations with grade III views at laryngoscopy and all of these were performed by senior anaesthesiology trainees with at least four years experience. There were 14 complications: 8 cases of arterial desaturation, 3 of hypotension and 1 each of gastric contents aspiration, oesophageal intubation and traumatic bleeding from the airway. Notably, 11 of these occurred during straightforward (grade I and II) laryngoscopy. Propofol was the most widely used induction agent (45.3% of cases) and a combination of midazolam and fentanyl were used in the place of induction agents in 36% of cases. Succinylcholine and atracurium were the most widely used muscle relaxants (45.3% and 41.9% of cases respectively). 44 (51.2%) intubations were carried out in critical care areas, and the remainder in other parts of the hospital.

**Conclusions:** Our observational study found a high incidence of difficult laryngoscopy and complications from tracheal intubation, even by experienced anaesthetic trainees. It is vital that such difficulties are rapidly and appropriately managed in the acute setting. 48.8% of intubations occurred outside critical care areas, where conditions for emergency tracheal intubation are often sub-optimal. The broad variations and combinations of drugs used demonstrate a significant departure from the classical standardised rapid sequence induction believed to improve clinical outcomes in critically ill patients. This variation according to the individual patient’s clinical condition requires familiarity and versatility with the full range of intubating drugs. These results highlight the difficulties and risks involved in the tracheal intubation of critically ill patients, and support a continued role for the anaesthesiologist in these cases.

**References**


**Paper No: 871.00**

**Effect of bilirubin and Carboxy-hemoglobin Concentrations on Mortality in Critically Ill Patients**

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**Introduction:** Serum bilirubin concentration is routinely measured in intensive care patients. Its elevation can suggest liver dysfunction or biliary pathology, but also sometimes haemolysis. However, the clear cause of its elevation is often unclear. Physiologically, bilirubin is a one of three heme metabolites, which also include ferrous ion and carbon monoxide (CO), but this fact is almost completely ignored in our daily physiological assessments. Intensive care physicians hardly ever take notice of carboxy-haemoglobin (CO-Hb) in routine blood gas analysis except for specific patients (e.g. burns). In this study, we examined the prognostic value of the two products of heme metabolism: Total bilirubin (T-Bil) and carboxy-haemoglobin (CO-Hb) in a general ICU populations. We previously reported higher T-bil and CO-Hb concentrations in patients with the highest mortality (Ref.). In this study, we compared the characteristics of these patients in a little more detail.

**Objectives:** To assess the prognostic significance of serum total bilirubin and carboxy-hemoglobin concentrations in critically ill patients.

**Methods:** We retrospectively studied 491 ICU patients and their 1882 blood gas measurements and laboratory results in 22-beds general ICU during 1 year period. We collected these patients’ demographics and APACHE II scores on ICU admission. We specifically assessed the prognostic significance of serum T-Bil and CO-Hb and their combination. We divided these ICU patients in four groups by T-bil and CO-Hb values. The cut off value for T-bil was 1.05mg/dL and for CO-Hb 1.7%. We divided the patients in four groups according to their T-Bil and CO-Hb results: Group HH: high T-bil and high CO-Hb Group LH: low T-bil and low CO-Hb. Group HL: high T-bil and low CO-Hb Group LL: low T-bil and high CO-Hb

**Results:** Our ICU patients had a mean age of 61.8 (SD: 16.1), a mean APACHE II score of 12.1 (SD 4.4). They stayed for a mean of 7.3 (SD 9.3) days in the ICU. Their hospital mortality was 5.5%. Group HH had a significantly higher mortality than other groups: HH: 11.1%, LH: 1.2%, HL: 3%, LL: 3.5%; p < 0.0001 (Chi-square test). The APACHE II scores of the four groups were not significantly different (APACHE II score, HH: 12.4 (SD 5.3), LH: 11.9 (SD 3.6), HL: 12.1 (SD 4.5), LL: 11.8 (SD 3.7); p = 0.63). Even after adjustment for APACHE II score, the four groups had different odds for mortality (Adjusted Odds ratio; HH = 3.48 (95%CI 1.34-10.8), reference LL = 1).

**Discussion:** Almost 80% of our patients were post-surgical and they were not very sick. Our result should be assessed in the sicker patients. The clear mechanisms of the increased T-bil and CO-Hb were unknown. However, we believe that the breakdown of heme proteins such as hemoglobin, myoglobin, and cytochromes will be important pathophysiology in ICU patients.

**Conclusions:** The combination of a higher T-bil and CO-Hb was associated with significantly higher hospital mortality, independent of APACHE II score.
Reference

Paper No: 879.00

The effects of pentoxifylline on proinflammatory and anti-inflammatory cytokines induced by peritonitis in rats

Wen-Jinn Liaw, Cheng-Ming Tsao and Chin-Chen Wu

Introduction: Much of evidence has found that pentoxifylline (PTX) can improve cardiovascular function and decrease mortality by decreasing the plasma level of TNF-alpha in animal and human studies. PTX has now been found to have a variety of pharmacological effects, which could be of benefit in sepsis.

Objectives: Our current study is to investigate the different cytokines expression during the time course of sepsis and to elucidate the therapeutic effect of PTX in the different stage of sepsis.

Methods: Samples were collected at 0, 3, 6, 9 and 18 hour in each animal unless animal died. Animals who received CLP were divided into five groups. Group I received intravenous injection of PTX (5 mg/kg) treatment immediately after surgery. Group II received the same dose of PTX injection at hour 3, Group III at hour 6 and Group IV at hour 9, respectively. Group V just received normal saline injection instead of PTX. Additionally, a sham group was used as control. Samples were collected just before each PTX administration separately. Both proinflammatory (TNF-alpha, IL-1beta/O) and anti-inflammatory (IL-4, IL-10) cytokines were analyzed to investigate the alterations according to the time course.

Results: After CLP, the plasma level of TNF-alpha increased as the time went on and reached its peak at the time point hour 3. TPX administered at time zero could significantly decrease the plasma level of TNF-alpha at the time point hour 3. The plasma level of IL-1beta increased as the time went on and reached its peak at the time point hour 6, and then kept at a plateau level till hour 9 and then decreased. TPX administered at time zero, hour 3 and 6 could all significantly decreased the plasma level of IL-1beta at their subsequent time point separately after giving the drug. The plasma level of IL-4/n increased from the time point hour 9 to 18. TPX administered at time zero, hour 3, 6 and 9 could all significantly decreased the plasma level of IL-4/n at the time point 18. The plasma level of IL-10/n increased as the time went on and reached its peak at the time point hour 3. Only PTX administered at time zero could significantly increase the plasma level of IL-10 at the time point of hour 6 and 9.

Conclusions: Administration of PTX in the early stage is found to be better than in the late stage of sepsis.

Paper No: 887.00

Use of remifentanil for awake tracheal intubation in critically ill

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Abstract: Awake intubation requires an anesthetic management that provides the security and comfort given adequate intubation conditions and hemodynamic variables stability. In this prospective clinical study, the purpose was to evaluate the hemodynamic variables with the use of remifentanil for awake intubation in critically ill patients.

Methods: 20 critically ill patients received a remifentanil as continuous infusion (0,1 microg/kg/min) for ten min before endotracheal intubation using a fiber optic laryngoscope while remaining awake. HR, SBP, DBP, RR, SatO2 and Glasgow values were recorded at baseline, 10 minutes post remifentanil infusion, and at postintubation. The hemodynamic change were compared with 20 patients scheduled for elective surgery. For intubation an optic fiber laryngoscope and induction was performed with midazolam bolus (0,5 to 0,7 mg/Kg)followed by a fentanyl (1.5 microg/kg)and propofol (2,5 mg/Kg)bolus. Statistical analysis was performed using ANOVA, and t-test, (p < 0.05 with statistical significance).

Results: UCI: basal: SBP: 116.8 mmHg, DBP: 65 mmHg HR: 121.4 beats/min, RR: 30 vent/ min, SatO2: 84.9%, Glasgow: 13 pts. At 10 min: SBP: 91.3 mmHg (p < 0.0001), DBP: 42.8 mmHg (p < 0.0001) HR: 107.8 (p < 0.01) beats/min, RR: 22.1 vent/min (p < 0.0001), SatO2: 91.95% (p < 0.0001), Glasgow: 10.5 pts. Stability in hemodynamic variables was observed during intubation, with slight increase in HR (110.4 bets/min) while obtaining the patient’s cooperation in the procedure with spontaneous mouth opening and all intubations were successful in the first attempt. Elective surgery patients: ASA I - III, baseline SBP: 111.7 mmHg, DBP: 72.1 mmHg, HR: 121.8 beats/min, RR: 24 vent/min, SatO2: 96.7%, Glasgow: 14 pts. Following induction: SBP: 92.5 mmHg (p < 0.0001), DBP: 53 mmHg (p < 0.0001) HR: 105.3 beats/min (p < 0.0001) SatO2: 100 % (p < 0.0001). In all cases a muscle relaxant was used for intubation. The only significant difference between groups was in SatO2, RR (p < 0.05), due to respiratory failure in UCI patients. Both groups demonstrated a significant decrease during induction in SBP, DBP, HR, RR and increased SatO2.

Discussion: Usually, for intubation in critically ill patients, drugs are used that depress hemodynamic variables, ventilation, and in a greater or lesser extent the patient’s neurologic state. With the remifentanil infusion, hypotension resulted which responded to expanders solutions, but this decrease was less pronounced (p < 0.05) than midazolam-fentanyl-propofol. Also observed was little
neurological depression and maintenance of spontaneous ventilation, with improvement in oxygen saturation in patients with symptoms of respiratory failure, making intubation safer. **Conclusion:** Remifentanil induction proved to be safe for intubation in critically ill patients and allowed them to remain awake, with slight hemodynamic alterations.

**Keywords:** Remifentanil; awake intubation; critical ill; hemodynamic variables

**Paper No: 892.00**

**Cardiopulmonary bypass for cardiac arrest due to accidental hypothermia - factors associated with survival**

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**Introduction:** Cardiopulmonary bypass (CPB) is considered the optimal treatment for patients with cardiac arrest (CA) due to accidental hypothermia. With CPB, outcomes exceeding those from sudden witnessed CA from ventricular fibrillation (VF) have been reported despite prolonged CPR. In a previous study, we reported our 10-year experience of using CPB for all hypothermic CA patients (1). In this paper we have expanded the study period to cover 18 years with the focus on identifying factors associated with survival.

**Methods:** Prehospital patients in Southern Finland with CA due to accidental hypothermia between 1991 and 2008 were included. EMS crews identified patients as hypothermic and in CA immediately initiated transportation with ongoing conventional CPR, which was continued en route to hospital. All such patients in Southern Finland are admitted to a single institution, which has a protocol for CPB for these patients. EMS run sheets and hospital records of all consecutive patients admitted because of CA due to hypothermia were abstracted for demographic and treatment data.

**Results:** The median age of the 43 patients with CA due to accidental hypothermia was 54 years (range 17-72), and 84% were male. The mechanism of hypothermia was exposure to cold air in 49%, immersion in cold water in 35% and submersion in 16%. The patients received a median of 70 min (range 20-230 min) of external CPR (pre- and in-hospital) before institution of CPB. Sixty percent of the patients survived to hospital discharge, 19 of them (44%) were neurologically intact at discharge. The survivors were significantly younger (46 years) than the patients who died (64 years; p < 0.004), had higher pH (p < 0.02) and base excess values (p < 0.02), and a lower potassium level (p < 0.008) than the non-survivors (Mann-Whitney).

**Conclusions:** The outcome data confirm that patients with cardiac arrest due to accidental hypothermia and who are treated with CPB have a favorable prognosis despite exceedingly long periods of external CPR before institution of CPB. The observed significant differences were not clinically relevant, and no single parameter assessed on admittance permitted prognostication of outcome. The potassium level on admittance was within physiologic range in 13 of the 17 non-survivors.

**Reference**


**Paper No: 952.00**

**Specificity of scoring systems in outcome prediction in geriatric patients in intensive care unit**

Pervin Bozkurt1, Pervin Cavusoglu2, Banu Gokay3 and Alpin Finci4

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**Introduction:** Scoring systems defining the severity of illnesses, also predicts the risk of mortality in ICUs.

**Objectives:** The aim of this study is to compare the mortality predictions of the Acute Physiology and Chronic Health Evaluation (APACHE II) score and Simplified Acute Physiology Score (SAPS II) with actual mortality rate in elderly patients who require ICU.

**Methods:** The patients who were admitted to an ICU since the establishment (2006-2011) were included in this study. The files of the patients older than 70 years and staying in ICU more than 24 hours were retrospectively evaluated. Only the first admission was accepted for multi admission. Demographical information, diagnosis at admission, additional diseases, duration of ICU stay, survival/mortality and APACHE II and SAPS II scores at admission were recorded and standardized mortality rate (SMR) was calculated. Correlation analysis (r2) was performed. Mean, standard deviation and minimum and maximum values were presented here.

**Results:** One-hundred seventy-six patients (88 male, 88 female) fulfilled the criteria. Patients age varied between 70-94 years, mean age was 79.8±5.3 years. Duration of ICU stay was 1-67 days (8.4±10.3 days). Mortality rate was 36.9%.

<table>
<thead>
<tr>
<th>Average</th>
<th>± std</th>
<th>Min</th>
<th>Max</th>
<th>r2</th>
</tr>
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<tbody>
<tr>
<td>APACHE II score</td>
<td>23.8±8.3</td>
<td>8</td>
<td>53</td>
<td>0.38</td>
</tr>
<tr>
<td>APACHE II predict mort.</td>
<td>47.6±23.8</td>
<td>8.7</td>
<td>99</td>
<td>0.39</td>
</tr>
<tr>
<td>APACHE II adjust. mort.</td>
<td>44.8±25.1</td>
<td>3.2</td>
<td>98</td>
<td>0.28</td>
</tr>
<tr>
<td>SAPS II score</td>
<td>48.5±17.1</td>
<td>12</td>
<td>99</td>
<td>0.36</td>
</tr>
<tr>
<td>SAPS II predict. mort.</td>
<td>46.3±26.3</td>
<td>3.9</td>
<td>97</td>
<td>0.43</td>
</tr>
</tbody>
</table>
There was no correlation between age and mortality rate (r² = 0.1), SMR was 77%, 82% and 80% for APACHE II predicted, APACHE II adjusted and SAPSII predicted mortality rates, respectively. Stratification of patients according to primary diagnosis of admission to ICU resulted with variable mortality rates. Patients with metastasis of carcinoma and with acute on chronic renal failure had 100% mortality. Patients with polytrauma, neurological disorders, aggravation of chronic multi organ problems (n = 42), and sepsis (n = 15) had mortality rates 66%, 52%, 42% and 40%, respectively. Mortality rates in patients with isolated respiratory problems or cardiac problems were 29% and 23%. Interestingly post CPR (n = 3) patients had mortality rate of 14% which is a little higher than postoperative care of elderly (n = 18, 11%).

**Discussion:** In contrast to study of Ip et al APACHE II and SAPS II scores were insufficient to predict the mortality rate in elderly.

**Conclusion:** The patients with metastatic carcinoma or renal insufficiency and polytrauma have mortality rate more than 50%, so this may predict poor prognosis in ICU for elderly patients.

**Reference**

**Paper No:** 958.00

**Sodium bicarbonate infusion in prevention acute kidney injury in adult cardiac surgical patients with preoperative chronic renal failure**

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**Introduction:** Acute kidney injury is common complication after cardiac surgery with cardiopulmonary bypass use. Cardiopulmonary bypass leads to release cytokines (IL-6, IL-8, TNF-?), free hemoglobin and free ferric ions. Sodium bicarbonate can protect kidney from oxydant injury by slowing PH dependent reaction of free radical production, directly scavenges peroxinitrite and others reactive oxygen species and protects from free hemoglobin and free ferric ions mediated injury.

**Objective:** The aim of this study was to evaluate whether sodium-bicarbonate infusion can prevent increase in serum creatinine level in cardiac surgical patients with chronic kidney failure.

**Methods:** This prospective study included 30 adult cardiac surgical patients with preoperative chronic kidney failure (serum creatinine level above 132 ?mol/l) independent of hemodialysis. Patients were divided in two groups (normal saline group- 15 patients who received 4 ml/kg/24h normal saline and sodium bicarbonate group- 15 patients who received 4 mmol/kg/24h sodium bicarbonate diluted in 1000 ml D5W). Infusions of normal saline or sodium bicarbonate started after induction in anesthesia. For statistical analysis we used Fischer’s exact test and Chi square test.

**Results:** There were no statistical significant differences between two groups in therm of age (saline group 72 ± 8 years vs. sodium bicarbonate group 74 ± 8 years, P > 0,05), duration of cardiopulmonary bypass (saline group 116 ± 18 minutes vs. sodium bicarbonate group 110 ± 10 minutes, P > 0,05), aortic cross clamping time (saline group 78 ± 7 minutes vs. sodium bicarbonate group 75 ± 8 minutes, P > 0,05), type of surgery CABG (saline group 9 vs. sodium bicarbonate group 8, P > 0,05), aortic valve surgery (saline group 3 vs. sodium bicarbonate group 4, P > 0,05), mitral valve surgery (saline group 2 vs. sodium bicarbonate group 0, P > 0,05), mixed CABG and valve surgery (saline group 2 vs. sodium bicarbonate group 2, P > 0,05). There was no significant difference in preoperative serum creatinine level (saline group 194 ± 26 ?mol/l vs. sodium bicarbonate group 197 ± 29 ?mol/l, P > 0,05). There was statistically significant difference in peak postoperative serum creatinine level between two groups(saline group 287 ± 48 ?mol/l vs. sodium bicarbonate group 237 ± 33 ?mol/l, P < 0,01). Two patients normal saline group were on hemodialysis after surgery but no one of patients sodium bicarbonate group (no statistical significant difference, P > 0,05).

**Conclusions:** Infusion of sodium bicarbonate in dose of 4 mmol/kg/24h can prevent significant increase in serum creatinine level in cardiac surgical patients with preoperative chronic kidney failure.

**Reference**
Expanding an anesthesiologist role beyond an operating room. Volatile based sedation in cardiac surgical patients

Marcin Wasowicz, Adriaan van Rensburg, Rita Katznelson, Angela Jerath and George Djaiani

Introduction: Sedation is a key-stone of the ICU therapy. No currently available sedative agent possesses the features of 'an ideal' medication used for ICU sedation. Most commonly used sedatives have considerable negative side effects such as withdrawal, delirium accumulation and tolerance. Theoretically, volatile anesthetics offer better sedation profile since we have very precise control over their action, emerge is rapid and since they are not metabolized the accumulation effect is minimal. Until recently their use in ICU setting was not practical due to technical requirements. Introduction of anesthetic conserving device (Anaconda, Sedana Medical, Sweden) allows use of volatile-based sedation in connection with any ICU ventilator. The aim of the presents study was to compare the volatile-based sedation to intravenous sedation in patients who underwent cardiac surgery. Hypothesis. Volatile-based sedation results in better outcomes when compared to intravenous sedation protocol using propofol.

Methods: Local REB approved study protocol. Investigation was designed as randomized, prospective, evaluator blinded study. 139 patients scheduled for elective coronary artery bypass surgery were randomized to receive volatile based sedation (VS) or propofol-based sedation (PS). Volatile-based sedation was provided with use of Anaconda device. Remaining perioperative procedures were standardized and protocolized including readiness for extubation and ICU discharge. Primary outcomes measured: length of mechanical ventilation and ICU stay. Secondary outcomes: Length of hospital stay and kidney function after surgery. Continuous variables were described by median and interquartile range values and the two groups were compared with the use of Wilcoxon non-parametric test. Categorical variables were described with frequencies and percentages, while the two groups were compared using Fisher's Exact test.

Results: 70 patients received VS and 69 PS. Patient characteristics were similar for both groups. VS resulted in shorter readiness/extubation time when compared to PS group (138 vs209min/ 185 vs. 291min, p < 0.001). Both groups have similar readiness/ discharge time from ICU. There was no difference in hospital stay between groups. Kidney function measured as gromelular filtration rate was similar in both groups.

Conclusions: Volatile based-sedation offers better sedation profile resulting in faster extubation time when compared to short-acting intravenous agent propofol. Study analyzed relatively short- term sedation after major surgical procedure (CABG). Based on these findings analyzing short-term VS we suggest that potential of this novel sedation technique should be explored in patients requiring prolonged ICU stay.
Peri-operative management of phaeochromocytoma, cardiovascular instability and patient outcomes

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Introduction: Phaeochromocytoma is a rare catecholamine-releasing tumour which was historically feared peri-operatively for its cardiovascular volatility during tumour resection. Due to its relatively high morbidity in the pioneer stages of treatment, adrenalectomy patients were routinely admitted to intensive care post operatively. However, current advances in its preoperative medical treatment, mode of surgery and intraoperative control of blood pressure have contributed in reducing the mortality and morbidity to almost zero.

Objectives: To compare peri-operative cardiovascular variability and course of intravenous phenoxybenzamine, immediately prior to the operation. 18 out of 25 (72%) had dual blockade with both alpha and beta antagonists, and only 2 (8%) were on a third antihypertensive agent. The preoperative MAP ranged to 2010 have been reviewed retrospectively. The scores of the Yeditepe University Hospital between the years 2005 and 2011. Data regarding the type of a blockade administered pre-operatively and anaesthetic technique had an effect on cardiovascular stability and also on postoperative recovery.

Methods: Data was collected retrospectively from reviewing the notes on 25 patients that were scheduled for an elective laparoscopic adrenalectomy in the period from 2008 to 2011. Data regarding the type of a blockade administered pre-operatively, catecholamine levels, size of tumour, mode of surgery, intraoperative techniques used, as well as intraoperative haemodynamic variability and complications were collected.

Results: All patients received the non selective α blocker phenoxybenzamine. 20 (80%) of these, were administered for a 3-day course of intravenous phenoxybenzamine, immediately prior to the operation. 18 out of 25 (72%) had dual blockade with both alpha and beta antagonists, and only 2 (8%) were on a third antihypertensive agent. The preoperative MAP ranged from 67 to 113 with a mean of 91.68 and mode of 90. Anesthetic technique for BP control varied with Remifentanil infusion being used in 12 out of 25 with a mean of 3 periods of instability (+/- 5.5SD), in 5 (20%) cases as the sole infusion. Other infusions used were: GTN in 11 cases with 9 mean episodes of instability and a SD of +/− 13.7, magnesium sulphate in 9 cases with 10.7 episodes of instability and a SD of +/− 14.9, and a b blocker infusion. Phentolamine was used as a bolus in 3/25 (12%). Only 1 patient (4%) required cardiovascular support post operatively, after acute massive haemorrhage. Out of all the operations that were planned laparoscopically, 2 were converted to open. Other complications included development of fast atrial fibrillation in a patient with known disease 48 hours postoperatively.

Conclusion: We conclude that differences in the preoperative and intraoperative management were not associated with any significant clinical changes in patient outcomes regarding organ support, intensive care admission, complications or prolonged hospital stay.

References

Scoring Systems for the prognosis of haematological oncology patients in critical care

Ezgi Bas, Sibel Temur, Ozge Koner, Murat Sayyn and Sami Karty

Introduction: Admission of haematological oncology patients to the critical care frequently requires use of extensive technological and physical resources. Therefore, admission of haematological oncology patients to the intensive care units lead to ethical dilemmas for oncologists and anaesthetists. The prediction of prognosis becomes important with respect to regulation of patient therapy and informing the patients and their relatives about mortality and morbidity.

Objectives: In our study, we aimed to evaluate the capability of the acute physiology and organ insufficiency scores with respect to prediction of mortality in the hematological oncology patients who were transplanted or nontransplanted bone-marrow and followed-up in the intensive care unit.

Methods: The scores APACHE II, III, IV, SAPS III and SOFA were evaluated and their predictive capabilities were compared. The patient files of the patients who were transplanted (Group 1, n = 25) or nontransplanted (Group 2, n = 25) bone-marrow and followed-up in the intensive care unit of the Yeditepe University Hospital between the years 2005 to 2010 have been reviewed retrospectively. The scores of the patients were recorded on a daily basis or in the first 24 hours following admission to intensive care unit depending on their specifications and their predictive capabilities with respect to mortality have been evaluated statistically. The SPSS 17.0 (SPSS Inc. Chicago, III, USA) software was used in the statistical evaluation.
Results: It has been detected that SOFA 1st day value (p < 0.05), SOFA 3rd day value (p < 0.01), vasopressor requirement (p < 0.05), aPTT value (p < 0.05), presence of reproduction in the blood culture (p < 0.05) of the Group I patients and APACHE III value (p < 0.05), SOFA 3rd day value (p < 0.05), vasopressor requirement (p < 0.001) and creatinin value (p < 0.05) of the Group II patients shown correlation with exitus in the intensive care unit.

Conclusions: APACHE III and SOFA can be used for evaluating the prognosis of haematological oncology patients.

References

**Paper No: 1116.0**

Genotyping of acinetobacter baumannii isolates from patients with severe sepsis in anesthesia intensive care unit

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Aim: Acinetobacter baumannii is considered as an emerging nosocomial pathogen in intensive care units. The most frequently clinical manifestation is sepsis and a fulminating course is observed when the patient presents septic shock. The aim of this study was to make an epidemiological surveillance of A.baumannii blood isolates from severe sepsis patients.

Material and Methods: Blood samples were collected from patients with severe sepsis which has occurred in anesthesia intensive care unit treatment over a three months period. In 11 of these blood samples A.baumannii was identified and RAPD-fingerprinting was performed for genotyping.

Results: DNA fingerprints generated with M13 and DAF4 primers identified 6 distinct strains in 11 patients. Genotype 1 and 2 were found in three patients, genotype 3-6 were found in one patient.

Discussion: This study demonstrates that there was patient-to-patient spread of strains and also epidemic behavior airborne spread of A. baumannii in hospital wards. RAPD-fingerprinting should be applicable to other units for epidemiological investigation of a hospital outbreak.

Keywords: Acinetobacter baumannii; RAPD-fingerprinting; anesthesia intensive care unit

**Paper No: 1130.0**

Effect of gender difference in patients of coronary artery bypass graft surgery and its impact on outcome in patients of Bangladesh – an observational study in BSMMU (Bangabandhu Sheikh Mujib Medical University) cardiac critical care unit

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Introduction: According to worldwide studies, females run an increased risk of early death and the development of post-operative complications after coronary artery bypass graft surgery as compared with males. In a study in United States for CABG patients, findings suggested that gender differences both within and across the races may be greater than the differences among racial groups. The crude mortality rates for coronary artery bypass surgery for men and women were 3.08% and 5.43% respectively, in New York State in 1989.

Objectives: This study in Bangladesh was an observational study from 1 year’s collection of data. This study was done to find out the cause of difference in outcome or course of Coronary Artery Diseases in different sexes within a same socio-cultural and economic background of a least developed country.

Methods: Patients (n = 33) who were undergoing CABG surgery were included, both male and female and within the age range of 40 to 70 years. Patient with an H/O previous cardiac surgery and more than four (4) risk factors were excluded. This study analyzed the risk factors and outcome parameters in relation to gender with assistance of a questionnaire. The baseline risk factors such as age, indication of CABG, pre-operative ejection fraction, post-CABG treatment etc. were matched. It also pointed to identify some socio-cultural factors that influence the patient outcome and to the analysis of the relation of the outcomes (mortality, morbidity and others) with the gender.

Results: Statistical analysis (Student’s T test) was done for baseline clinical variables, for socio-demographic profile on the basis of gender, for outcome parameters and for patients’ personal data. There was certain significant difference in outcome in different genders. (p = <0.05 - significantly, P = <0.01- highly significantly).
**Conclusion:** This study had an underlying research question that whether the difference of outcome of CABG in different gender is due to delayed approach of patient to the physician and delayed diagnosis of the CAD which indicates the gender-specific socio-demographic access to the health facilities in Bangladesh. Female gender is a predictor of higher morbidity in patients undergoing coronary artery bypass grafts. Social problems are higher in the group of females: such as delay in approaching the nearby GP or access to the cardiac specialists for her heart problem is delayed due to her dependence on the male population who are the earners.

**Paper No: 1141.0**

**Postoperative Delirium as a determinant of mortality in critical surgical patients**

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**Introduction:** Outcomes in critical surgical patients have been primarily described as mortality adjusted for severity of illness. However, other perioperative factors may be determinants. Such is the case of postoperative delirium (POD).

**Objectives:** Evaluation of the incidence and determinants of mortality, up to six months, in critical surgical patients.

**Methods:** Prospective cohort study conducted in a Post-Anesthetics Care Unit (PACU), with five intensive care beds, during 10 months. Exclusion criteria were: no informed consent, central nervous system disease, neurological or cardiac surgery, length of stay in the UCPA < 12 hours, age <18 years, permanent paralysis and a score < 25 The Mini Mental State Examination Test. Demographic data, perioperative variables, length of stay (LOS) in the PACU and in hospital and hospital mortality and at 6 months were collected. POD was evaluated using the Intensive Care Delirium Checklist (ICDSC). Descriptive analyses were carried and the Mann-Whitney U test, Chi-square or Fischer’s exact test were used for comparisons. Logistic regression analysis was used to evaluate the determinants of mortality with calculation of Odds Ratio (OR) and its confidence interval 95% (95% CI).

**Results:** 775 patients were admitted to the PACU, of which 680 met the inclusion criteria. The mortality rate at 6 months was 16% (n = 108). Univariate analysis showed that age (OR 1.03, 95% CI 1.02-1.05, p < 0.001), ASA physical status (OR 1.09, 95% CI 1.14-3.01, p = 0.013 for ASA III / IV), Revised Cardiac Risk Index (OR 2.59, 95% CI 1.57-3.01, p < 0.001, for IRCR > 2), emergent surgery (OR 2.70, 95% CI 1.67-4.26, p < 0.001), units of Erythrocytes (OR 1.15, 95% CI 1.04-1.27, p = 0.006), and units of platelets used during surgery (OR 1.25, 95% CI 1.05-1.49, p = 0.012), POD (OR 4.92, 95% CI 3.15-7.69, p < 0.001), APACHE II (OR 1.14, 95% CI 1.09-1.19, p < 0.001), SAPS II (OR 1.07, 95% CI 1.05-1.09, p < 0.001), PACU LOS (OR 1.01, 95% CI 1.00-1.01, p < 0.001) and hospital LOS (OR 1.01, 95% CI 1.01-1.02, p < 0.001) were considered risk factors for mortality. In multivariate analysis, delirium (OR 3.26, 95% CI 2.01-5.29, p < 0.001), SAPS II (OR 1.06, 95% CI 1.04-1.08, p < 0.001) and hospital LOS (OR 1.01, 95% CI 1.01-1.02, p < 0.001) were independent risk factors of mortality.

**Conclusion:** Delirium, SAPS II score and hospital LOS were considered independent risk factors of mortality, up to 6 months, in critical surgical patients.

**Reference**


**Paper No: 1154.0**

**Topical tenecteplase for dissolution of a life threatening endobronchial clot**

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**Introduction:** Large endobronchial clots can result in substantial respiratory impairment and potentially life-threatening airway obstruction. Therapeutic modalities include: suctioning (both blind and with the use of flexible bronchoscopy), lavage, forceps, rigid bronchoscopy, cryotherapy and topical thrombolytics. Experience in the use of topical thrombolytic agents is limited to a number of case reports including the successful use of streptokinase and urokinase typically administered via flexible bronchoscope. To our knowledge the use of recombinant tissue plasminogen activators as a topical thrombolytic for endobronchial clots has never been reported.

**Objectives:** To report the successful use of tenecteplase (TNK), a recombinant tissue plasminogen activator, to dissolve a life threatening endobronchial clot.

**Results:** Research ethics board approved reporting the case. An otherwise healthy fifty-six year old male presented to the emergency department with acute onset gross hemoptysis nine-days after a left mucosal bronchial biopsy for recurrent pleural effusion. He had been asymptomatic since a single bout of hemoptysis immediately post-biopsy. The patient was brought to the operating room and had his airway secured with a single-lumen endotracheal tube and a bronchial blocker was placed in the left main stem. He was admitted to the intensive care unit for ongoing monitoring and subsequently underwent a pulmonary angiogram. During the evening of post-admission day 5 he developed a massive endobronchial clot with intermittent total airway compromise. Initial interventions including blind suction, flexible bronchoscopy and lavage were unsuccessful in relieving the obstruction. Subsequently, suction was applied directly to the endotracheal tube which was withdrawn pulling with it large portions of clot and subsequent re-intubation. Thoracic surgery was consulted for rigid
bronchial obstruction, though the patient’s condition deteriorated prior to their arrival. Traditional methods failed to control the clot burden and the patient decompensated resulting in a hypoxic cardiac arrest. CPR was commenced and 50mg of TNK was injected down the endotracheal tube. Within 60s the respiratory therapist noted a decrease in airway pressure and greater lung volumes. The patient returned to sinus tachycardia after 7 minutes of CPR. The patient had bilateral chest tubes placed and was stabilized prior to an emergent lobectomy. The patient had a protracted ICU stay, though was discharged 30 days post-operatively for rehabilitation secondary to an anoxic brain injury.

Conclusions: Large endobronchial clots are life-threatening emergencies. TNK, as a topical thrombolytic, was a successful adjunct in this resuscitation. Further reports examining indications, safety and dosing of endobronchial thrombolytics would better delineate their use.

References

Paper No: 1164.0
Risk factor identification for prolonged mechanical ventilation following cardiac surgery
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Introduction: Prolonged mechanical ventilation following cardiac surgery is associated with increased morbi-mortality. Numerous studies have identified risk factors for prolonged ventilation in this particular population. The Prolonged Ventilation Score was developed by Reddy et al. in 2007 to assess accurately the risk of a ventilation time greater than 48 hours. (1) This score, validated on more than 10,000 patients, can be easily used in day-to-day practice to calculate patient-specific risk.

Objectives: The first objective of this study was to identify risk factors associated with prolonged mechanical ventilation in our cardiac surgery patients. The second objective was to evaluate the relevance of the Prolonged Ventilation Score in our population.

Methods: This retrospective study analyzed 331 consecutive adult patients undergoing cardiac surgery between September 2008 and December 2010. Prolonged ventilation time was defined as a postoperative ventilation time lasting for more than 24 hours. This cut-off value was chosen according to the definition of the Society of Thoracic Surgeons. (2) A multivariate logistic regression analysis was undertaken to identify independent risk factors for prolonged ventilation. The area under the receiver operating characteristic (ROC) curve was calculated to assess the performance of the Prolonged Ventilation Score to predict a postoperative ventilation time greater than 48 hours.

Results: Among the study population, 24% of patients (79/331) met our criteria of prolonged ventilation. The following independent risk factors were found: left ventricular ejection fraction less than 30%, complex surgical procedure including coronary artery bypass grafting, high logistic EuroSCORE and high intraoperative doses of vasoactive drugs. ROC curve analysis demonstrated the accuracy of the Prolonged Ventilation Score in our patients, with an area under the curve of 0.775.

Conclusions: Compared to the literature, the incidence of prolonged ventilation time was higher in our population. This could be explained by the absence of sedation and ventilator weaning protocols in our intensive care unit. However, risk factors for prolonged mechanical ventilation were found similar to those identified in previous studies. The Prolonged Ventilation Score appeared interesting to predict ventilation time greater than 48 hours. Specific strategies, including sedation and ventilator weaning protocols, should be undertaken in order to reduce postoperative ventilation and its associated morbi-mortality.

References

Paper No: 1175.0
Frequency of microbiological isolates in the intensive care unit – five year audit
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Introduction: Surveillance data for health-care associated infection (HCAI) exist in most developed countries (1). In intensive care medicine infection control represents the most important issue for safe management (2).

Objective: The aim of this study was to analyze microbiological isolates from different patients’ samples, taken on
admittance in the intensive care unit (ICU) and further on, once weekly until discharge.

**Design:** Prospective, randomised, observational cohort study between January 1, 2007 and August 1, 2011.

**Setting:** Sixteen-bed, adult, tertiary level surgical-medical intensive care unit.

**Methods:** All patients hospitalized more than 48 hrs during study period were eligible for study entry. They were underwent to routine microbiological screening at admission into the intensive care, and weekly thereafter. Samples were taken from tracheal aspirate, nasal, inguinal and axilla swabs. Urine, skin around central venous catheters, surgical and pressure ulcer wounds, abdominal and chest drainage and blood culture, if it was indicated, were microbiologically analyzed, as well. Susceptibility to antibiotics of all isolates was tested in vitro. As full “sensitivity” were considered more than 75% of isolates susceptible to antimicrobial drugs, as “intermediate” if more than 25% and less than 75% were susceptible, and as resistant in the case that less than 25% of isolates were susceptible to certain antibiotic.

**Results:** In comparison to the first year of study (2007), there were more samples without any colonisation in the last study year -2011 (65,23% vs 71,16%). In the 2011, the most frequently Enterococcus species was isolated (13,6%), while it was Klebsiella species (6,03%) in the first study year. Both species were sensitive to carbapenemes. Acinetobacter species were more frequent in the last study period (10%) versus 5,6% in 2007, with intermediate sensitivity to carbapenemes only. Increase in the Pseudomonas aeruginosa isolates was observed in the last two years (7,5%) too, which was less sensitive to cephalosporins III generation than previously.

**Conclusion:** In the five year study period our local epidemiology indicates better infection control measures, but insufficient respect of standardized antibiotic prescription protocols.

**References**


**Paper No: 1179.0**

**Descriptive study of a capacity assessment tool to emergency medical care service delivery at the district health level**

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**Introduction:** The evaluation of provision of emergency medical care in the developing country’s setting is challenging for both development program managers and local country partners. A capacity assessment tool was developed by the collaborative work between development agency’s technical assistant, heads of health centers and dispensaries, representative consultant physician of the department of emergency medicine of the district hospital, and representative of ambulance drivers. It was designed to help health facility managers assess their capacity to emergency medical care provision.

**Objectives:**

- To describe the structure of the capacity assessment tool
- To describe the capacity profile of different care delivery sites

**Methods:** In order to describe the design, the relevance of each core component of the tool to appraise the capacity for emergency care service delivery provision was commented. While applied to the everyday practice’s setting of the local service delivery sites, the tool yielded a stratified characterization of each site’s challenges. The related result was described as well.

**Results:** The tool incorporated indicators for service provision including accessibility, availability, and basic service capacity standards indexes. Indexes were based on 5 items ranking scoring.

Stratified capacity assessment of different key sites of emergency care service delivery has identified the difficulties faced at each level. As a consequence, the priority capacity strengthening needs have been determined: pre hospital management faced concerns related to infrastructure, drug and equipment; transport system suffers from knowledge and guidelines’ issue; intra hospital management dealt with challenges related to drugs and equipment issues.

**Discussion:** The process of conducting stratified assessment of emergency care service delivery sites may be facilitated by the use of comprehensive and simplified capacity assessment tool. The tool could be considered a supplementary specific tool to complement the global facility assessment tools.

**Conclusion:** Further managed rather than random strengthening of the health system in the specific domain of critical care could be developed on the basis of the priority strengthening needs identified through field elaborated capacity assessment tool.

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Recruitment maneuver and inhaler treatment with selective endobronchial intubation for treatment of atelectasia due to car accident

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Introduction: The treatment of atelectasia is composed of respiratory exercise, inhaler therapies and bronchoscopic procedures. Here, we want to present a case with atelectasia which is refractory to conventional treatment and treated with bronchoscopic aspiration, recruitment maneuver to one lung performed with endobronchial blocker and inhaler treatment.

Case Report: A 37-year old male was accepted to intensive care unit with a diagnosis of left lung contusion, multiple extremity and rib fractures at another facility. The patient developed a dyspnea and referred to our department. The chest X-ray and computerized tomography revealed a left total atelectasia. A bronchoscopy was performed and a severe secretion was observed at the left bronchial branches and the secretion was aspirated. The patient is observed in intensive care unit for the next 5 days and respiratory exercises, inhaler therapies were performed. However, the blood gas parameters worsened so a bronchoscopy under general anesthesia was planned. Bronchoscopy revealed a total obstruction of left main bronchus with secretion. The secretion was washed with saline and aspirated. In order to provide ventilation of the left lung, an Arndt endobronchial blocker (9F,65cm) was placed to the right main bronchus. The patient was ventilated with 100 % oxygen for 3 minutes and the endobronchial cuff was inflated. With pressure controlled ventilation at 20 cmH2O recruitment maneuver was performed to left lung. In order to prevent reflex bronchospasm, 2.5 mg salbutamol sulphate and 0.5 mg budesonid was applied as inhaler for 10 minutes. Left bronchus was washed with saline and aspirated. Recruitment treatment was re-performed to the left lung and followed with inhaler therapy. A chest X-ray obtained at the OR revealed that the majority of the left lung was ventilated. The patient was extubated at the PACU at the 4th hour of the procedure. The computerized tomography obtained at 24th hour showed that the atelectasis was totally resolved.

Conclusion: There are studies in the literature reporting bronchial entubation for treatment of atelectasia. However, atelectasia treatment with endobronchial blocker which is a less invasive procedure is not reported. There are larger studies needed in order to determine the efficacy and the possible complications of this treatment modality.
Inhaled nitric oxide combined with corticosteroids attenuate kidney and heart toll-like receptors 4 expression in a porcine suprarenal aortic cross clamping ischemia reperfusion model

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Introduction: Inhalation of nitric oxide (iNO 80 ppm) modifies ischemia reperfusion injury (I/R-I) in extrapulmonary tissues [1]. The combination of iNO (30ppm) and intravenous corticosteroids modifies endotoxin–induced organ damage in a piglet endotoxin model [2]. Toll-like receptor 4 (TLR4) signalling is a critical modulator of cell survival and I/R-I in many organs [3].

Objectives: We evaluated a combination of iNO and corticosteroid therapies on renal and heart TLR4 mRNA activation determined by quantitative real time PCR after 90 minutes of supraprenal aortic cross clamping (SRACC) followed by 20 hours observation in a I/R-I piglet model.

Methods: Piglets were subjected to abdominal laparotomy and SRACC for 90 minutes, and then observed for additional 20 h of intensive-care treatment. Renal cortex biopsies were sampled (stored in RNAlater® Solution) at: T0; 1h before SRACC, T3; 3 h after SRACC release, T20; 20 h after SRACC release. Heart left ventricle tissue was sampled only at T20. Piglets (n = 23) were randomized into 3 groups: 1) (n = 10) iNO (80ppm)+i.v. corticosteroids (25 mg x 3) started 30 min. before SRACC and continued 2 h after SRACC release followed with decreased iNO (30 ppm) until 20 h after SRACC release (sevoflurane ANCONDA anesthesia/sedation). 2) (n = 10) control, after SRACC a 20 h observation period (sevoflurane ANCONDA anesthesia/sedation). 3) (n = 3) Sham surgery (no SRACC), thereafter a 20 h observation period (sevoflurane ANCONDA anesthesia/sedation).

Results: Renal TLR-4 mRNA activation was seen (p < 0.05) at T3, in all groups subjected to SRACC after 3 h of reperfusion, compared to baseline and sham surgery animals. This increase was reduced (p < 0.05) in animals treated with iNO+corticosteroids, compared to pigs without treatment with the same anesthesia. Heart TLR-4 mRNA activation was reduced (p < 0.05) in animals treated with iNO+corticosteroid, when compared to animals without treatment.

Conclusions: The combination of inhaled Nitric Oxide and i.v. corticosteroids diminishes kidney and heart TLR-4 mRNA expression in a porcine SRACC I/R-I model.

Elevated myoglobin following restraint of a prisoner in the ICU: a case of exertional rhabdomyolysis

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Introduction: Rhabdomyolysis is a known sequela of extreme physical activity (1). Release of metabolic products following muscle breakdown produces a diverse clinical picture. Complications range from mild muscle soreness to acute renal failure requiring hemodialysis (2). These situations can be further complicated by arrhythmias, coma, and death (3). We report a case of a prisoner requiring restraint after attempted escape and violent behavior against the staff in the ICU.

Case Description: A 51 year old male prisoner with known psychiatric history was admitted to the SAICU following attempted suicide by hanging in his cell. He arrived in the Emergency Department and was found to have significant laryngeal edema with possible laryngeal fracture. He was intubated for airway protection following complaints of dyspnea and dysphagia. After his airway was further evaluated, the patient was extubated. Approximately one hour after extubation, the patient became violent, assaulted an armed guard and nurse. He attempted escape but was unsuccessful as his left lower extremity was shackled to the bed. Restraint was accomplished using capsicum spray and IM haloperidol. Two male physicians restrained him in the prone position. Post restraint labs showed elevated myoglobin, hyperkalemia, hyperphosphatemia, hyperlactemia and acidemia. The patient was not cooperative with the physicians and therefore we were unable to obtain a review of systems.

Discussion: Restraint of patients in the ICU is occasionally required for safety of the patient and staff. However, this is not an innocuous event. Extreme resistance to restraint can result in exertional rhabdomyolysis. Complications include metabolic abnormalities, rhabdomyolysis, compartment syndrome, disseminated intravascular coagulation and acute renal failure (4). Treatment involves aggressive IV rehydration and alkalinization of the urine to prevent renal damage. Electrolyte abnormalities should be corrected to avoid arrhythmias (5). It is also important to have an appropriate course of action in place for patients who require restraint. The use of prone position and capsicum sprays have been...
determined to be detrimental to a patient’s cardiac and pulmonary systems and can even result in death (6).

**Conclusion:** This case illustrates the complications that are encountered when restraint of a violent patient is required in the ICU. Early diagnosis and treatment are essential to prevent serious morbidity. ICU staff should be educated on the possibility of these interactions and should be trained to appropriately respond. Although restraint may be necessary, upright techniques used wherever possible may prevent serious injury to the patient and their care team.

**References**


**Paper No: 1221.0**

Is endovascular cooling less stressful than surface cooling? stress, cerebral, and metabolic responses in a porcine model of mild hypothermia

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**Introduction:** Mild therapeutic hypothermia (MTH) reduces morbidity after cardiac arrest(1). In the post cardiac arrest setting, organs are susceptible to ischemia if hypoperfused. Endovascular or surface cooling methods can be used(2). Surface cooling elicits a strong sympathoadrenal response, which can have adverse effects on muscle and brain(3,4). Lowering of metabolic needs and perfusion of the tissues might not occur concomitantly, resulting in hypoxia or ischemia. The cardiac arrest can result in anoxic brain damage. This presents as edema of the brain(5). Some patients with brain edema has also been exposed to MTH. The effect of hypothermia per se on possible brain edema has not been investigated.

**Objectives:** 1) To investigate whether endovascular cooling is superior to surface cooling during mild hypothermia in regards to eliciting a lower stress-response. 2) To elucidate the effect of hypothermia on possible brain edema.

**Methods:** Eighteen 60 kg female pigs are anesthesized and ventilated. Microdialysis catheters are placed in the brain, muscle, and subcutaneous tissue. A probe measuring temperature, oxygen saturation and pressure is placed in the cerebrum using a stereotactical procedure. Near Infrared Spectroscopy is used for regional saturation (rSO2) monitoring. After baseline MRI of the cerebrum, six animals are allocated to each group by randomisation: 1) Surface cooling using EMCOOLS® pads, 2) endovascular cooling using Alsius Coolgaard® system, or 3) control. In groups 1 and 2, cooling is commenced. After 8 hours a second MRI is obtained and the animals are euthanized. Bloodsamples are obtained at discrete timepoints. Microdialysis is harvested at 30 min. intervals. Primary endpoint is the difference in plasma epinephrine between groups. Secondary endpoints include p-norepinephrine, s-cortisol, s-ACTH, electrolytes, acid-base status. Intra cerebral pressure, oxygen saturation, temperature, and decrease in rSO2. Tissue ischemia is based on lactate, pyrovate, glucose and glycerol dialysate values, and is considered when lactate levels exceed 15 mmol/L or glucose levels below 0.2 mmol/L.

**Results (preliminary):** Pilot studies have been conducted, results were not available at the time of submission of the abstract.

**Conclusions (discussion):** It is important to know the effects of a given therapy. The differences in stress-response and cerebral impact of different cooling methods need to be elucidated to provide the best care in the post resuscitation setting.

**References**


**Paper No: 1236.0**

**Inhibition of NF-êB by pyrrolidine dithiocarbamate attenuates sepsis-induced acute renal failure**

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**Introduction:** Sepsis-caused multi-organ failure remains still a leading cause of death in patients of intensive care units with a mortality rate higher than 50% (1). Acute renal failure (ARF) is a critical complication of sepsis, because it clearly worsens the survival prognosis during sepsis (2). Pyrrolidine dithiocarbamate (PDTC), a well known inhibitor of Nuclear factor (NF)-êB, has been shown to attenuate the formation of proinflammatory cytokines, to prevent the development of systemic hypotension and to improve survival in endotoxemic animals.

**Objectives:** The present study was therefore undertaken to examine the effect of NF-êB inhibition on sepsis-induced ARF and on sepsis-induced downregulation of V2 receptor and AQP2 expression being essential transporting systems for adequate tubular function. Additionally, NF-êB may be an interesting target also for treating sepsis-induced ARF.

**Methods:** All animal experiments were performed according to the National Institutes of Health Guide for the Care and Use of Laboratory Animals and were approved by the local animal protection committee. In the present study, we examined the effect of PDTC on sepsis-induced downregulation of vasopressin V2 receptors and aquaporin (AQP)-2 channels using a cecal ligation and puncture (CLP) mouse model (C57/BL6 mice). Hemodynamic parameters and expression of vasopressin V2 receptors and aquaporin (AQP)-2 channels on the mRNA (rt-PCR) and protein (western blotting) level were examined.

**Results:** CLP caused a time-dependent downregulation of renal vasopressin V2 receptor and of AQP2 expression without alterations in plasma vasopressin levels. Renal activation of NF-êB in response to CLP was attenuated by PDTC pretreatment, which also attenuated the downregulation of V2 receptor and AQP2 expression. Furthermore, a strong nuclear staining for NF-êB throughout the whole kidney in response to CLP was observed. Additionally, PDTC pretreatment inhibited the CLP-induced increase in renal TNF-ê and IL-1ê concentration and NOS-2 mRNA abundance. Moreover, PDTC pretreatment ameliorated CLP-induced hypotension and ARF demonstrated by increased urine output, renal perfusion and tubular reabsorption activity.

**Conclusion:** Our findings suggest that NF-êB activation is of utmost importance for the downregulation of AQP2 channel and vasopressin V2 receptor expression during sepsis, being essentially involved in the pathogenesis of septic tubulat dysfunction. In addition, our data indicate that NF-êB inhibition ameliorates sepsis-induced ARF.

**References**


**Paper No: 1245.0**

**Brain dead: the value of brain perfusion scan**

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**Introduction:** The concept of brain death appears in the second half of the twentieth century, when technological advances allowed for the maintenance of cardiorespiratory function in the absence of cerebral functioning 1. The determination requires the obligatory presence of several clinical criteria, which may implicate the extension of the time until confirmation. 2 Although the diagnosis is clinical, the role of complementary tests, namely the Brain Perfusion Scan (BPC), represents, in some cases, a way to remedy the confirmation, which would translate into an unquestionable benefit, particularly when it comes to organ transplantation. 1, 2

**Objective:** To analyze the importance of the BPC in the diagnosis of brain death with regard to two cases of patients, potential donors, with clinical criteria for brain death, but with positive findings for benzodiazepines.

**Method** A literature review based on a Medline. Keywords included the following: brain dead, brain perfusion scan, cerebral blood flow and organ donor. Search parameters were combined to find articles relevant to the discussion of BPC in the evaluation of brain death.

**Results:** The BPC is a reliable and effective method in the confirmation of brain death, determining the absence of cerebral blood flow through the use of radiopharmaceuticals that are captured by the blood circulation or the blood brain tissue itself, and the result is easily interpreted objectively by an expert in nuclear medicine.1,2 The patient should be stable, with normal ventilation parameters, and without biochemical disturbances.2 It is indicated in cases of hypothermia, presence of depressing agents of the central nervous system or neuromuscular blocking agents in the circulation, severe facial trauma or as part of an institutional protocol. It does not induce changes in the potential for organ donation and the results are not affected by metabolic, toxic or electrical interference. Also, head injuries are not counter-indicated. 1

**Discussion** The determination of brain death is of clinical nature, and arises from technical need consequent to the technological replacement of other organs, and there
currently are unquestionable, reliable and reproducible criteria for its determination. In specific clinical situations, BPC minimizes the time until the definitive brain death diagnosis, allowing for a faster organ donation, with all the benefits that come with it.

Conclusion Although brain death remains a clinical determination, it is important to recognize that auxiliary techniques are often used to support the diagnosis, particularly when contradictory factors may delay or difficult clinical diagnosis.

References

Paper No: 1248.0

The gradient between the oxygen saturation of the superior cava vein and the pulmonary artery (ÅSO2) may reflect myocardial oxygen metabolism during sepsis

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Introduction: A positive gradient between the oxygen saturation of the superior cava vein and pulmonary artery (ÅSO2) are associated with better outcomes in critical patients. This may correspond to a better cardiac metabolism this determines a reduction of the coronary sinus saturation. Understanding this, would determine its clinical use. Objective Analyze the ÅSO2 at different times in a septic animal model.

Methods: Twelve pigs were anesthetized and mechanically ventilated. In the Septic group (S) (n = 8) LPS from E. coli was given and then was treated with fluid resuscitation and vasopressor drugs. No intervention was made in the control group (SHAM). The measurements were obtained at baseline, 60, 120, 180 and 240 minutes. Blood flow in the left anterior descending artery (LADF), superior cava vein oxygen saturation (SscO2), pulmonary artery oxygen saturation (SpO2), inferior cava vein oxygen saturation (SicvO2) and the coronary sinus oxygen saturation (ScsO2) were measured. The myocardial O2 extraction (EmO2) was calculated. Both groups were compared with (T test considered significant p < 0.05). Data are expressed as mean ± SD.

Results: The ÅSO2 was different between both groups at 60 min (p = 0.024), the S group decreased and was negative (-0.075 ± 5) the SHAM group increased (8 ± 5). Following that, the ÅSO2 in both groups it descended, however SHAM remained positive and the S stayed negative during the study. The SvO2 increased in group S after 180 (p = 0.02) and 240 min (p = 0.05). There were no differences in either the SicvO2 nor the SsccO2. The ScsO2 showed a statistically limited difference at the 120 min (p = 0.057) and 180 min (p = 0.058). The LADF increased and was different at 180 min (p = 0.008) and 240 min (p = 0.014). The EmO2 decreased at the 120 min (p = 0.011) and 180 min (p = 0.030). The S group showed a fall in MAP and SVR. The GC did not differ.

Conclusions: The S group showed a decrease and inversion in ÅSO2, due to an increase in the ScsO2. Coronary flow is increased compared to baseline and SHAM group. Therefore, in the coronary circulation there would be a change in self-regulation with increased coronary flow and decreased EmO2 which explains the change in ScsO2. This pattern is similar to what occurs in the systemic circulation during shock. According to our results, ÅSO2 is a useful measure to assess changes in myocardial metabolism and coronary circulation during sepsis.

References