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AER VS HELIUM NON-INVASIVE PRESSURE SUPPORT IN ACUTE COPD DECOMPENSATION: A PROSPECTIVE, RANDOMIZED STUDY
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INTRODUCTION. In decomposed COPD, noninvasive pressure support ventilation (NIVP) with helium (He) can reduce dyspnea, PaCO2, and work of breathing more than NIVP with Air/ O2. However, it is unknown whether these effects can have beneficial consequences on outcome, and what the financial implications in routine practice are, due to He/CO2’s high cost. This study aimed to explore these aspects.

METHODOLOGY. All patients with COPD, admitted to the ICU for NIVP over a 24-month period were included. At ICU admission, patients were randomized to Air/O2, or He/CO2. Initial settings, pressure support pressure support setting update (15 cmH2O), FiO2, 0.25, PaO2 > 50 mmHg. Subsequent setting changes, number of daily trials performed, decision to intubate, and ICU discharge criteria followed our standard practice guidelines.

RESULTS. (mean ± SD). 123 patients (MF 7/32, age 71 ± 10 years, Apache II 17 ± 4 admission values: respiratory rate 25 ± 6 bpm, pH 7.31 ± 0.04; PaO2/FiO2: 252 ± 102; PaCO2: 9 ± 4 kPa. No baseline difference or notified initial response to NIVP, complications or mortality was noted between Air/O2 and He/CO2 groups.

Air/O2 (n = 64) He/CO2 (n = 59)
NIVP tinitals duration min. 9.2 (7.4-10) (182) 9.7 (7.4-10) (228)
Intubation n patients% 13/20 8/13.5
LOSC ICU days 6.2 (5.0) 3.1 (3) 0.019
LOS hospital days 19 (12) 13 (6) 0.019
Cost/pt total NIVP costs € 1,842 (421) 786 (56) 0.019
Cost/pt incl NIVP gas ICU stay costs 11,373 (10,876) 9,530 (7,483)
Cost/pt hospital stay costs 14,069 (9,657) 10,530 (5,309)
Cost/pt incl NIVP gas entire stay costs 26,023 (16,485) 19,851 (10,321)

Mean (SD) * p < 0.002 vs. Air/O2

CONCLUSION. With the current NIVP approach, He/CO2 did not significantly reduce the intubation rate. However, hospital stay was shorter with He/CO2. He/CO2 gas cost was higher with He/CO2 but represents a small fraction of ICU costs. Hence, hospital stay and total costs were lower with He/CO2. Further studies on decomposed COPD should be conducted to better define the place of He/CO2 NIVP, as it can be safely administered and proved to be a cost-effective strategy.

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HELIox DURING NON-INVASIVE MECHANICAL VENTILATION IN HYPERCAPnic COPD exacerbation
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INTRODUCTION. Non-invasive mechanical ventilation (NIVM) with helium (He) has been recommended in acute COPD hypercapnic (1).

METHODOLOGY. Aims: to compare effects during NIVM with two gases, helium (He) and oxygen (O2) in hypercapnic COPD exacerbation. Method: Facem NIVM with BIPAP Vision (Respironics Inc.). Randomized controlled method to apply gas (He) or (O2) for 5 min.

RESULTS. Fifty COPD were enrolled. Dates at baseline (t = 0), 30 minutes (t = 1) and end therapy (t = 2) were analysed in 2 groups. Gas helium mixes: 72:28; UC1 stay: 25.6 ± 1 days (Heliox group) and 6.4 ± 9 days (Air group, p < 0.08). Success NIVM: Heliox 25/22, Air-Oxygen 25/22. Skin lesion 0/5 (heliox group) 3/2 (Air group).

1. He = HELIox 2. O2 = AIR p < 0.05

Age 72.9 ± 10 74.9 ± 8 ns
IFAP mmHg 17.1 ± 3 16.1 ± 3 ns
pH ± 0 7.30 ± 0.07 7.22 ± 0.03 0.08
P(2) ± 2 7.25 ± 0.1 7.27 ± 0.2 ns
PaO2 ± 0 79.2 ± 17 78.6 ± 2 0.08
PaO2 ± 1 77.1 ± 12 96.3 ± 46 ns
PaO2 ± 2 60.8 ± 20 64.6 ± 20 ns

2. He = HELIox 2. O2 = AIR p < 0.05

SAPS II 31.45 ± 12 35.2 ± 8 0.02
IFAP mmHg 8 ± 1 8 ± 1 ns
PaO2 ± 0 61.3 ± 22 70 ± 38 ns
PaO2 ± 1 91.9 ± 24 106 ± 31 0.07
RR ± 0 34 ± 8 32 ± 12 ns
RR ± 1 20 ± 3 30 ± 2 0.05
RR ± 2 24 ± 2 23 ± 1 ns
Houan NIMV 17.1 ± 32 17.1 ± 26 ns

CONCLUSION. Preliminary data of a open pilot randomized controlled study are: short UC1 stay (±0hs) and improve acidosis/hypercapnia at t = ±0hs in NIVM-HE group were not found at initial significant level.

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NON-INVASIVE PRESSURE SUPPORT VENTILATION DELIVERED BY HELMET AS A TREATMENT OF ACUTE HYPOXIC RESPIRATORY failure
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INTRODUCTION. To assess the efficacy of noninvasive pressure support ventilation (NPSV) using a new special helmet as first line intervention to treat patients with hypoxic acute respiratory failure (ARF), in comparison to NPSV using standard facial mask. Results of a prospective clinical pilot investigation with matched control group in three intensive care units of university hospitals are reported.

RESULTS. Thirty-three consecutive non-COPD patients with hypoxic ARF (defined as severe dyspnea at rest, respiratory rate > 30 breaths/min, PaO2/FiO2 < 200, and active contraction of the accessory muscles of respiration) were enrolled. Each patient treated with NPSV by helmet was matched with two controls with ARF treated with NPSV via a facial mask, selected by SAPS II age, PaO2/FiO2, and arterial pH on admission. Primary end points were the improvement of gas exchanges, the need for endotracheal intubation and the complications related to the NPSV.

RESULTS. The 33 patients and the 66 controls had similar characteristics at baseline. Both groups improved oxygenation after NPSV. Eight patients (24%) in the helmet group and 21 patients (63%) in the facial mask group (P = 0.5) failed NPSV and were intubated. No patients failed NPSV due to intolerance of the technique in the helmet group in comparison with 8 patients (38%) in the mask group (P = 0.047). Complications related to the technique (skin necrosis and gastric distension) were fewer in the helmet group compared to the mask group (no patients versus 10 patients [15%], P = 0.031). Helmet allowed the continuous application of NPSV for a longer period of time (P = 0.05). Length of stay in the ICU, intensive care and hospital mortality were not different.

CONCLUSION. NPSV by helmet successfully treated hypoxic ARF, with better tolerance and fewer complications than facial mask NPSV.

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HEPARCH VERSUS RECOMBINANT HIRUDIN FOR ANTICOAGULATION IN CONTINUOUS RENAL REPLACEMENT THERAPY

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INTRODUCTION. Heparin as standard for anticoagulation in continuous renal replacement therapy (CRRT) has a bleeding incidence of 20% and is contraindicated in patients with hepatic dysfunction. Thrombocytopenia type II (1). Recently, continuously administered recombinant hirudin (hirudin) has been reported to be as effective as heparin for CRRT (2). However, bleeding complications were observed only in the hirudin group. The aim of the study was to compare continuous administration of hirudin and intermittent administration of hirudin as anticoagulants in CRRT with respect to haemostatic efficacy, described as filter run time, and possible bleeding complications.

METHODS. After ethical committee approval and written informed consent from the legal representatives, 27 critically ill patients with an indication for CRRT were randomly allocated to 2 groups: hirudin 15 patients; initial dose 250 IU/h; aim activated clotting time (ACT) 180-280, 125 IU/h stepwise heparin dose change; hirudin 12 patients, initial dose 5 mg/kg bolus and consequently 2 mg/kg bolus to achieve an aimed ecarin clotting time (ECT) of 85-105. Every four hours prothrombin time (PTT), thromboplastin time (PTT), hemoglobin (Hb) and thrombocytes were determined. A bleeding complication was defined as an Hb decrease of more than 2 g/dL with clinical bleeding signs. The observation time was 96 hours, the filter run time of clotted filters were recorded. Statistical analysis: Mann-Whitney-U-Test and Fisher exact test.

RESULTS. The results are presented in Table 1.

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IMPACT OF MALNUTRITION ON THE PERFORMANCE OF THE APACHE II SEVERITY-OF-ILLNESS SCORING SYSTEM IN ACUTE RENAL FAILURE

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INTRODUCTION. Although pre-existing severe malnutrition has been shown to be an independent predictor of mortality in acute renal failure (ARF), the currently used prognostic scoring systems do not take into account this factor. We tested the hypothesis that poor nutritional status impairs the predictive ability of the APACHE II model (Acute Physiology and Chronic Health Evaluation, version II) in ARF.

METHODS. We prospectively studied all patients admitted for ARF to the Internal Medicine and Nephrology Department over a seven-year period (Jan 1994 to Dec 2000) 614 patients (393 males), median age 71.5 years (interquartile range 60-78); APACHE II 22 (18 ± 28); serum creatinine 5.1 mg/dl (3.3 ± 7.1); blood urea nitrogen 80 mg/dl, 56 ± 109; acute tubular necrosis in 421/614 (66.8%), hemodilution or continuous venovenous hemofiltration in 374/614, 60.9%). Nutritional status was evaluated at admission by the Subjective Global Assessment (SGA) method (3), and patients were divided into three classes: normal nutritional status (SGA Class A: 247/614, 40.2%), at risk of malnutrition or moderately malnourished (SGA Class B: 148/614, 23.8%), severely malnourished (SGA Class C: 221/614, 36%). Risk of death was predicted for each patient using the original APACHE II equations (2). Calibration of the models was analyzed by the Hosmer-Lemeshow (L-H) “C” statistic (4), discrimination by the Receiver Operating Characteristic (ROC) curve (5).

RESULTS. Data on outcome prediction performance are illustrated in the Table.
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LACTATE METABOLISM DURING HAEMOFILTRATION WITH EITHER BICARBONATE OR CHLORIDE AS REPLACEMENT FLUID
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INTRODUCTION. Lactate is commonly used as fluid for replacement during hemofiltration since its metabolism results to an alkalinization. But lactate is also a useful substrate permitting to carry energy and reducing equivalent among cells and organs. The use of exogenous lactate as replacement fluid may interfere with its metabolism, therefore the aim of this study was to investigate lactate metabolism in acutely ill patients undergoing hemofiltration.

METHODS. Seven patients (4M/3F, age = 51.7 ± 7.7, 16-68) hospitalized in intensive care unit (APACHE II = 25 ± 2.6, 16-37) and were assigned to receive at one day interval and in a random order bicarbonate (BICAR) or lactate (LAC) as fluid replacement during hemofiltration. Lactate metabolism was investigated in both situations by using an exogenous lactate challenge test (1: 2.5 mmol/kg body weight were infused during 15 minutes and plasma lactate concentrations (L) in the blood and in the ultrafilter were followed at T = 0, 4, 8, 12, 16, 20, 24, 30, 60, 90, 120 and 150 min after the end of the perfusion. Lactate clearance (LC), total lactate turnover (endogenous plus exogenous rates, TC), lactate release in the ultrafiltrate (LR), endogenous lactate production (ELP), metabolized lactate (ML) were calculated from basal lactate and from the areas under the USAC, (area under the unadapted experimental points, by using Kaleidagraph® (Abelson Software, Reading, PA, USA). Results are given as mean ± sem, statistical comparisons were achieved by using a paired student’s t-test, indicating significance difference p < 0.05.

RESULTS. Ultrafiltration rate was similar in BICAR and LAC (1418 ± 133 vs 1448 ± 137 ml/hour during BICAR, bicarbonate infusion rate was 17 ± 12 mmol/kg/min while patients received 10 ± 13 mmol/kg/min of lactate during LAC).

CONCLUSION. Basal plasma lactate concentration was significantly increased during lactate replacement as compared to bicarbonate but lactate clearance and endogenous lactate production were not affected. In addition, despite a significant increase in lactate release in lactate administration, total lactate turnover and metabolized lactate were significantly increased by lactate therapy as compared to bicarbonate period. These results indicate that exogenous lactate supplied by the fluid replacement is metabolized on top of endogenous lactate, which is not affected.

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EFFECT OF THE MODE OF DELIVERY ON THE EFFICACY OF PROSTACYCLIN AS AN ANTICOAGULANT CONTINUOUS VENO-VENOUS HAEMOFILTRATION
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INTRODUCTION. Prostacyclin is a short-acting inhibitor of surface and shear stress induced platelet activation and is frequently used as a method of anticoagulation in continuous renal replacement therapy where there is a coexistent coagulopathy or thrombocytopenia. It is often the sole anticoagulant. Prostacyclin is absorbed onto the fibres of biocompatible membranes and therefore pre-filter administration may result in less platelet inactivation than if the drug were administered as a systemic intravenous infusion. This may in turn lead to shorter filter life and more pronounced thrombocytopenia. In order to address this question we have prospectively compared filter life and platelet count for both pre-filter and systemic intravenous administration of prostacyclin.

METHODS. Over a four month period we studied a total of 142 haemofiltration episodes in 16 series of patients (mean APACHE II score 13, interquartile range 14.5) with heparin dysfunction and platelet counts of less than 50 x 10^9/L. Anticoagulation was provided with an infusion of epoprostenol 5 ng/kg/min (Glaxo Wellcome, Middlesex, UK) and each filter episode was randomised for the epoprostenol to be delivered either pre-filter or systemically. Patients did not receive any other anticoagulants or antithrombotics during the course of the study. Patients with proven heparin induced thrombocytopenic syndrome were not included in the study. Both groups were treated with hollow fibre polysulphone haemofilters (Baxter Healthcare Corp., Edwards Lifescience, Irvine, CA). Pre-filter fluid replacement, 2 L/h exchange volume with a blood flow rate of 180 ml/min. Comparisons between groups were made using the Mann-Whitney U Test.

RESULTS. There were 79 filter episodes in the pre-filter group and 63 in the systemic intravenous group. The median platelet count per filter episode was 34 x 10^9/L in the pre-filter group and 45 x 10^9/L in the systemic group, P = 0.1495. The median filter life was 780 minutes in both groups.

CONCLUSION. Systemic administration of prostacyclin in the setting of continuous veno-venous haemofiltration does not result in prolonged filter life or a significant improvement in thrombocytopenia in critically ill patients.

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ENDOTHELIN-1 PRODUCTION IN HUMAN AORTIC ENDO THELIAL CELLS STIMULATED BY CEREBROSPINAL FLUID OF PATIENTS WITH SUBARACHNOID HAE Morrow
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INTRODUCTION. Endothelin-1 (ET-1) has been shown to be increased in cerebrospinal fluid (CSF) of patients which develop cerebral vasospasm or cerebral ischaemia. However it is not known what effect ET-1 represents as a mediator for vasospasm. We investigated the effects of CSF collected from 20 patients with subarachnoid hemorrhage (SAH) due to rupture of cerebral aneurysm on ET-1 production from human aortic endothelial cells (HAEC).

METHODS. Patients were classified according to the anatomic evidence for vasospasm (day 7 post-hemorrhage) and a daily neurological evaluation (Glascow Coma Score = GCS): no vasospasm (NV), angiographic vasospasm (AV = mild), clinical vasospasm (CV = severe) low GCS (neurological deterioration not due to vasospasm). CSF samples were collected daily, centrifuged at 3000 G for 5 minutes, and stored at -80°C. HAEC (60-80% confluence) was incubated for 6 hours with CSF from patients on day 4 post-hemorrhage (when vasospasm started to occur) or from normal subjects (control group). ET-1 was measured in the medium (ELISA) and normalised for total cell protein.

RESULTS. Patients were equally distributed according to the presence of vasospasm and other neurological sequelae: ET-1 levels in HAEC supernatants were 1.67 ± 0.32, 1.66 ± 0.54, 1.88 ± 0.49, 1.76 ± 0.45 and 2.165 ± 0.79 fmol/mg cells in treated with CSF from control, NV, AV, CV and low GCS group respectively. Only the low GCS group showed a significant increase in ET-1 production compared to control (ANOVA p < 0.05).

CONCLUSION. ET-1 production was significantly increased only in HAEC treated with CSF from low GCS patients who had already developed cerebral ischemia on day 4 post-hemorrhage. However, there was no significant difference in ET-1 production in HAEC stimulated with CSF from patients with various degrees of vasospasm. These results suggest that ET-1 production may play a role in the early stages of neurological deterioration, and may be responsible for the development of cerebral vasospasm in SAH patients.

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THE CARDIORESPIRATORY INTERPLAY IN PATIENTS WITH MODS

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INTRODUCTION. According to the hypothesis of “Uncoupling of biological oscillators” (1), autonomic dysfunction is one of the main determinants exacerbating MODS. We have recently shown that the cardiopulmonary interplay (cardiac chemoreflex sensitivity (CCRS)) is the more blunted the more MODS is pronounced, but to date, there is no data available regarding the normal range values of this parameter. Our aim was to characterize CCRS in young healthy controls and to compare it with values obtained in MODS patients.

METHODS. We included 46 consecutive patients with septic (Sepsis Score according to Elebute & Boner [Sepsis > 2 at > 12) and nonseptic MODS. APACHE II Score (AP II) > 20 and < 30 was defined as moderate MODS, AP II > 30 as severe MODS. Additionally, we enrolled 13 young volunteers (4 female/9 male) without any known cardiopulmonary diseases as controls. The CCRS was calculated as the regression slope of heart interval (H) and PAO2/H and PAO2 were assessed at baseline, at a 1/3 increase of FiO2, and after returning to baseline (2).

RESULTS. The table summarizes the results of our study (mean ± SD). tp = 0.001 (3 vs. 2), tp = 0.002 (3 vs. 1). *p = 0.007 (3 vs. 2), t p = 0.001 (2 vs 1 / 3 vs 1).

| AP II  | SepScn | CCRS (ms/mmHg) | Age (years) | Weight (kg) | n |
|--------|--------|----------------|-------------|-------------|---|
| 1 Controls | 2.0±0.4 | 1.0±0.4 | 28±3 | 70±9 | 13 |
| 2 Severe MODS | 2.4±0.4 | 1.0±0.4 | 42±3 | 62±12 | 22 |
| 3 Severe MODS | 3.6±5 | 1.4±0.3 | 66±11 | 78±26 | 24 |

CONCLUSION. The cardiopulmonary interaction is depressed in MODS patients compared with young healthy controls. Restoring of autonomic function may be a promising option for future therapeutic intervention in MODS according to the hypothesis of “Uncoupling of biological oscillators” (1).

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THE IMPACT OF THE DEGREE OF TRICUSPID REGURGITATION ON UTILIZATION OF THE PULMONARY ARTERY CATHERETER

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INTRODUCTION. The aim of the study is to find the relationship between the grade of tricuspid regurgitation (TR) and accuracy of cardiac output (CO) measurement by thermodilution in mechanically ventilated patients.

METHODS. 27 non-cardiac surgery patients were separated into three groups. All patients were initially investigated by transesophageal echocardiography (TEE) (multiplane probe, Omniplane, Hewlett-Packard) and later the pulmonary artery catheter (PAC) was inserted for maintaining haemodynamic instability. All patients with higher than the 1st degree of aortic regurgitation were excluded. There were 8 patients with no or the 1st degree of TR graded according to color doppler criteria, the second group consisted of 9 patients with the 2nd degree of TR. The third group included 10 patients with the 3rd degree of TR. All patients were measured twice simultaneously by TEE and PAC for cardiac output. At least three pulsitron were measured using continuous doppler for velocity-time integral (VTI) at the level of aortic valve and at least six VTI were averaged in the case of stroke volume (SV) variation in atrial fibrillation. Aortic valve area (AVA) was measured by planimetry twice and results were averaged. SV was calculated multiplying VTI with AVA and heart rate (1.2). Simultaneous PAC measurement was carried out applying three 10 cm boluses of iced saline.

RESULTS. The mean difference between TEE measurement and PAC measurement was 514.1±541.3 ml/min in the first group of patients (t = 0.96 < 0.001). The mean difference of 837.8±976.1 ml/min was found in the second group of patients (t = 0.92 < 0.001). The difference between the two modes of CO measurement was 1890.2±1143.9 ml/min in the third group (t = 0.89 p < 0.001).

CONCLUSION. The difference in the third group is probably caused by inadequately low values of CO measured by thermodilution. The inaccuracy of CO measurement in the group of patients with the 3rd degree of TR can be misleading. It can be concluded that this is a significant inaccuracy in another calculated parameters like pulmonary and systemic vascular resistances and stroke work indexes of left and right ventricle.

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PRIMARY SUCCESS RATE OF DIRECT CURRENT CARDIOVERSION IN SURGICAL INTENSIVE CARE PATIENTS

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INTRODUCTION. Postoperative supraventricular tachycardias (SVTA) are a frequent complication in surgical intensive care patients. Although direct current cardioversion (DCC) is known to be a highly effective therapy for terminating SVTA in medical patients its effectiveness in the treatment of SVTA in surgical intensive care patients has never been investigated. Therefore we studied effectiveness of DCC in 37 postoperative critically ill patients with new onset SVTA without any history of previous tachyarhythmias.

METHODS. SVTA were defined as narrow-complex, non-sinus tachycardias with heart rates > 100 bpm for at least 15 minutes. In all patients a twelve lead ECG, arterial blood gas and serum electrolyte analysis were obtained before DCC. Serial creatine kinase MB isoenzyme determinations (three times within 24 hours) were performed. Demographic data including age, sex, weight, height, premorbidity factors, and admission SAPS-score as well as presence of SIRS with or without systemic infection were recorded from all patients. DCC was perform- ing using a monophasic, damped-sinus-wave defibrillator. Energy levels used were 50, 100, 200 and 300 Joules (J) for regular SVTA and 500, 200, 360 J for irregular SVTA. Therapeutic effec- tiveness of DCC was followed for 48 hours. Demographic, premorbidity, laboratory data, pres- ence or absence of SIRS with and without systemic infection were compared between patients responding to DCC and nonresponders using chi²-test. Fischer’s exact test or Kruskal-Wallis one-Way Analysis of Variance. P-values < 0.05 were considered significant.

RESULTS. None of the patients experienced clinically relevant hemoins (paO2 < 60 mmHg), hypokalemia or hypomagnesemia at onset of SVTA. DCC restored sinus rhythm in 13 out of 37 patients (35 % primary responders). However, at 24 hours and 48 hours, only 6 (16%) and 5 (13%) patients remained in sinus rhythm, respectively. Primary responders were significant- ly younger and demonstrated significant differences in arterial paO2 values and ionized calcium concentrations at onset of SVTA when compared with nonresponders. In the present study 24 patients (65 %) fulfilled the criteria of SIRS with and without infection before onset of SVTA. In addition 29 patients (78 %) received catecholamine and/or phosphodiesterase inhibitor ther- apy.

CONCLUSION. In surgical intensive care patients DCC is an ineffective therapeutic method for successful long-term termination of new-onset SVTA. We speculate that differences in eff- ectiveness of DCC between medical patients and surgical intensive care patients may result from major differences in the primary trigger mechanisms responsible for SVTA development.

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CHEST INFECTION FOLLOWING INTENSIVE CARE: THE EFFECT OF DYSPHAGIA AND TRACHEOSTOMY

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INTRODUCTION. Poor residual health has been reported by patients following intensive care (ICU) discharge (1). Dysphagia can be a major risk factor for aspiration pneumonia (2). Tra- cheostomy is frequently performed on ICU. The aim of this study was to evaluate the effect of tracheostomy and dysphagia on the incidence of chest infection in ICU survivors.

METHODS. A prospective observational study based in the follow up clinic of a teaching hos- pital. All patients were invited to attend clinic three months after ICU discharge. We reviewed consecutive patients attending clinic between February 1999 and 2001. Patients were asked if they had noticed any change in swallowing or experienced a chest infection since ICU discharge. All tracheostomy scars were examined for healing.

RESULTS. 171 patients were reviewed. 63 (37 %) reported chest infection since ICU discharge. 73 (43%) of all patients reported dysphagia with nine noticed immediately post ICU. DCC 10% of the dys- phagic patient had suffered a chest infection, p < 0.05 chi squared. ICU tracheostomy was per- formed on 51 patients. Of these 21 had chest infection following discharge. Four patients had a poorly healed tracheostomy and two of these reported chest infection. 72 patients expressed satisfaction with their general health, even though 29 had suffered chest infection.

| Chest infection | n | % | Swallow worse | Swallow same/ better | Trache. | No trache. | Satisfied with health | Dissatisfied |
|-----------------|---|---|---------------|---------------------|--------|----------|---------------------|--------------|
| N=171 | 63 | 37 | 35 | 24 | 42 | 29 | 34 |

* N° chest infection 100 |

101 | 30 | 78 | 43 | 65 |

% of chest infection in ICU survivors

CONCLUSION. ICU survivors are at high risk of chest infection in the three months following discharge. Difficulty swallowing may contribute to this risk. The incidence of chest infection may be underestimated as clinic non-attenders have more health problems (1). We could not detect any association between tracheostomy and chest infection following ICU.

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BACTERIAL COLONISATION OF LOWER AIRWAYS IN MECHANICALLY VENTILATED CARE UNIT PATIENTS

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INTRODUCTION. The pathogenesis behind nosocomial infections in the intensive care unit (ICU) in particular ventilator-associated pneumonia (VAP) is still controversial. The aim of the present study was to assess the development over time and impact of oropharyngeal and gastric colonisation on the emergence of tracheal colonisation possibly leading to VAP in mechanically ventilated patients in a Swedish multidisciplinary ICU. Special emphasis was made on elucidating the role of anaerobic bacteria in the lower respiratory tract.

METHODS. Consecutive patients (n = 41) requiring mechanical ventilation for more than 3 days were included. Patient characteristic were: median age 59 years (range 26-82), 15/41 were females. Median APACHE II score was 19, range 0-44. ICU mortality was 11/41. Ten of the patients had undergone transplantation, 32/41 patients had got at least one antibiotic before admission, 12/41 patients had clinical pneumonia at the time of admission. Samples were collected from oropharynx, subglottic space, trachea and stomach. The samples were collected after intubation and then every third day until day 3 or extubation. All samples were immediately transported to the laboratory and frozen to –70 °C until analysed.

RESULTS. Patients were heavily colonised (> 60% of samples) with microorganisms not considered to belong to a healthy normal gastric and oropharyngeal flora already at admission to the ICU. A majority of harboured enterococcus, coagulase-negative staphylococci and candida spp. at least one site on day 1. The patients were colonized with rather constant levels of microorganisms over time. Only in 4/41 an increasing concentration and in 9/41 a decreasing concentration over time in at least 50% of the isolated species were found. An increasing load over time was associated with enterococci, gram-negative anaerobes and enterobacteriaceae. Decreasing levels occurred mainly in candida spp. We found anaerobes the majority were gram-negative, prevotella spp in subglottic and tracheal secret from day 12 to day 25 in a range between 40-100% of all samples. Interestingly only one patient had pneumococci and one hemophiles influenzae species detected. One of the 41 patients developed VAP according to the criteria in the study.

CONCLUSION. Patients in the ICU subjected to prolonged intubation showed a different pattern of colonisation as compared to the non-hospitalized population already at the time of admission and even though the colonisation pattern usually associated with VAP days in the ICU was present from the start. In addition the presence of anaerobic species was high with a distribution also in the lower airways. This finding may be related to improved methodology in cultivating these strains. Obviously the colonisation pattern of ICU patients is variable over time as well as geographically. Therefore the relevance and applicability of literature reports for the individual unit must be interpreted with some caution.

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THE PATHOGENESIS OF VENTILATOR-ASSOCIATED PNEUMONIA(VAP) IN SURGICAL PATIENTS: ROLE OF AEROIDIGESTIVE COLONIZATION

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INTRODUCTION. Bacteria may gain entrance into the lung by several mechanisms. The major mechanism underlying the development of VAP seems to be (micro-) aspiration of potentially pathogenic microorganisms (PPM) (1). The aim of this prospective observational study was to describe and assess the relationship between oropharyngeal (OC), gastric (GC) and tracheal colonization (TC) patterns preceding VAP in surgical patients.

METHODS. During a two years period, consecutive adult surgical patients at high risk for VAP and not receiving antimicrobials were studied. Quantitative cultures of endotracheal aspirate, nasopharyngeal swab (NP), oropharyngeal swabs and gastric aspirates were cultured in a qualitative manner, on admission and then thrice weekly until extubation. In case of clinical suspicion of VAP (clinical VAP), quantitative invasive diagnostic techniques (ID) including PSB and BAL, were performed to confirm the diagnosis (probable VAP). Organisms of the same genus and species were considered identical on the basis of antibiotic sensitivity and proportion. Proportions were compared with the chi-square test, with Bonferroni's adjustment for multiple comparisons.

RESULTS. A total of 178 patients (cardiac surgery 46%, trauma 29% neurosurgery 16% miscellaneous 9%) were studied. After 7 respectively 14 days of intubation 80.6% respectively 94.3% of patients acquired VAP used to study. 240 episodes of clinical VAP in 95.3% patients. Probable VAP was documented in 69 (38%) patients. Patients with higher age (p = 0.019) and cardiosurgical patients (p < 0.007) suffered more VAP and patients developing VAP had a significantly longer ICU-stay (p < 0.0001). A total of 101 PPM causing VAP were isolated. A strong correlation was found between EIA and ID samples (Rho = 0.655, p < 0.0001) and TC consistently preceded the development of VAP For all PPM causing VAP and considering only OC as GC prior to or concurrent with toxic (OC) (78% was significantly more frequent than GC (40%) (p < 0.0003). Considering both OC and GC the oropharynx was the most frequent (95.3%) initial site to be colonized and the most frequent (65%) site to be involved. The time of extubation or within 4 hours after extubation or after extubation 6 hours. This load caused VAP. For indole enterobacteriaceae, Pseudomonas and S. aureus, OC and GC prior to or concurrent with toxic OC (100%) and GC (p < 0.0002) and 20% (GC) (p < 0.0032), 85% (OC) and 14% (GC) (p < 0.0001).

CONCLUSION. In surgical patients without previous antimicrobial therapy, the tracheobronchial tree appears to be the main source of most microorganisms causing VAP. The oropharynx seems the pivotal source of a majority of PPM causing VAP while the stomach may be less important. PPM in this category of surgical VAP.

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NON-MICROBIOLOGICALLY DOCUMENTED ICU-ACQUIRED PNEUMONIA: IS IT A VALID ENTITY AND WHAT IS ITS RELEVANCE?

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INTRODUCTION. There is considerable debate about the relevance and even the existence of non-microbiologically documented (CD) ICU-acquired pneumonia (VAP). The goal of our study was to assess the incidence, relevance, impact and mortality of CD-VAP compared to microbiologically documented (MD) ICU-acquired pneumonia.

METHODS. Retrospective analysis of prospectively collected data of all VAP occurring in a 12 bedded Intensive Care Unit of an Emergency Department of an University Hospital in Porto, from the 1st January 1999 to the 31st December 2000. The agreement of at least two senior intensivists in face of the clinical situation and of one senior intensivist acting as a reviewer of the clinical file was required for the diagnosis of VAP. MD-VAP was a pneumonia acquired more than 48 hours after admission to the ICU in which a plausible pathogen was isolated in bronchial secretions and/or blood cultures. In CD-VAP no plausible pathogen was found. Goal variables used to compare MD- and CD-VAP were: hospital mortality, ICU-mortality, mortality caused by VAP, day of VAP diagnosis, days of antibiotic therapy, mechanical ventilation and ICU stay after VAP, success of the first empiric regimen and concomitant existence of other infection. Concomitant infections were defined as those diagnosed from day – 2 to day 10 relating to VAP diagnosis. Statistical tests used were Chi-square and Mann-Whitney.

RESULTS. The results were as follows:

| Total | MD-VAP | CD-VAP | p |
|-------|--------|--------|---|
| n = 165 | n = 131 | n = 34 | |
| Global hospital/ICU mortality | 32/25% | 31/24% | 35/26% | NS/NS |
| Mortality caused by VAP | 7% | 8% | 6% | NS |
| Day of VAP diagnosis | 6 | 5 | 6 | NS |
| Days of antibiotic therapy after VAP | 8 | 8 | 7.5 | NS |
| Days of mechanical ventilation after VAP | 6.5 | 6.5 | 7 | NS |
| Days of ICU stay after VAP | 11 | 10 | 10 | NS |
| Success of 1st empiric regimens | 68% | 65% | 74% | NS |
| Concomitant existence of another infection | 80% | 36% | 39% | 0.018 |

CONCLUSION. MD- and CD-VAP seem to be similar in terms of all goal-variables studied and the existence of another infection concomitant with VAP is even more frequent in MD- than in CD-VAP. These two facts lead us to admit the existence and the clinical relevance of CD-VAP.
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INCIDENCE, PREVALENCE AND PATTERN OF FEDERING SYNDROME-ASSOCIATED BIOCHEMICAL ABNORMALITIES FOLLOWING COMMENCEMENT OF TOTAL PARENTERAL NUTRITION
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INTRODUCTION. The feeding syndrome refers to a complex metabolic phenomenon, which occurs following the re-introduction of carbohydrate-calories to a critically ill or chronically malnourished patient. Clinically, it is marked by severe hyperphosphatemia, but changes in potassium and magnesium may also be important. The aim of this study was to define the prevalence and incidence of feeding syndrome-associated abnormalities in a large cohort of hospital-based patients commenced on TPN.
METHODS. The Mater Misericordiae Hospital is a 510 bedded University Teaching Hospital serving a population of 200,000 and has a large tertiary referral practice. Between December 1989 and December 1997, 976 patients were commenced on in-hospital total parenteral nutrition. The set-up, delivery and monitoring of TPN was performed by a specialist Intravenous Nutrition Service consisting of a dedicated IV nutrition nurse and a consultant intensive care physician. Referral for TPN was made through the appropriate team caring for the patient, or directly in part of the multidisciplinary team in the intensive care unit. The Intravenous Nutrition Service reviewed the biochemical profile of patients individually before commencement of TPN (including electrolytes) daily for five time per week. The database of the Intravenous Nutrition Service was interogated. Serum phosphate, magnesium and potassium levels were recorded daily prior to and following commencement of TPN. A detailed record was kept of the daily TPN prescription and this included phosphate, magnesium and potassium levels in the bag and supplemental phosphate, magnesium or potassium received. Statistical analysis was performed using SPSS for Windows (Version 10). Significance was assumed at the five percent level.
RESULTS. The mean phosphate level decreased significantly (P < 0.001) after commencement of TPN. The prevalence of hyperphosphatemia was 18.8% prior to commencing TPN. The incidence on day 1 was 9.3% (P < 0.001). The mean potassium level decreased significantly (P < 0.001) after commencement of TPN. The prevalence of hypokalemia was 25.9% prior to commencing TPN. The incidence on day 1 was 8.7% (P < 0.001). The mean magnesium level was low prior to commencing TPN and increased significantly (P < 0.001) following the introduction of TPN. The prevalence of hypomagnesaemia was 39.7% prior to commencing TPN. The percent of patients with a low magnesium level decreased to 25.4% on day 2 to 6.0% on day 7 after commencing TPN.
CONCLUSION. The prevalence of feeding syndrome-associated biochemical abnormalities in a large cohort of hospital total parenteral nutrition patients was recorded. The incidence of hyperphosphatemia and hypomagnesemia were lower than observed.

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EVALUATION OF ENTERAL, PARENTERAL AND COMBINED NUTRITION IN PATIENTS WITH SEVERE HEAD INJURY
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INTRODUCTION. The hypermetabolism in patients with severe head injuries results in malnutrition, increased metabolic requirements and multiple organ failure (1). This is followed by inadequate nutritional support plays a crucial role in clinical outcome. The objectives of our study were: to test the hypothesis that early nutritional intervention in severe head injury and to study their effects on nitrogen metabolism.
METHODS. Thirty patients with GCS < 8 were randomly placed in enteral (EN) (n = 10), parenteral (PN) (n = 10) and combined enteral-parenteral nutrition (CN) (n = 10) groups. Targeted caloric intake was 30–35 kcal/kg/day nonprotein and 1.5–2.0/mg/kg/day protein. Nitrogen balance, biochemical parameters and energy expenditure were evaluated daily.
RESULTS. The demographic data of the patients were similar between the groups. The mean targeted caloric intake of the groups were 2196 ± 960 kcal/day in enteral, 2280 ± 175 kcal/day in parenteral and 2225 ± 270 kcal/day in combined nutrition groups (p = 0.01). In enteral nutrition group, it took 5.3 ± 1.6 days to reach targeted caloric amount, whereas balance periods of the targeted intake were shorter in parenteral (3.3 ± 1.2 days) and combined nutrition (3 ± 1.1 days) groups (p = 0.0008, p = 0.0002) when EN compared to PN and CN and p = 0.0003 when EN compared to CN). Nitrogen balance of enteral nutrition group on day 4 was lower than parenteral (p = 0.003) and combined (p = 0.0001) nutrition groups. On day 10, there was no statistically significant difference in nitrogen balance between the groups. Otherwise, there were statistically significant differences in TPN intake (19.3 ± 12.7 ml/kg/day vs 13.3 ± 5.6 ml/kg/day vs 17.3 ± 2.8 ml/kg/day, p = 0.0003) and duration of CPN in all patients, duration of mechanical ventilation and ICU stay of groups were found similar.

CONCLUSION. In severe head injury, when early enteral nutrition support is not sufficient due to the mechanical ventilation, combination of enteral and parenteral nutrition can be considered to improve the nutritional condition of severe head-injured patients.

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GLUTAMINE ENRICHED TOTAL PARENTERAL NUTRITION DOES NOT IMPROVE PROTEIN CATABOLISM IN PATIENTS WITH SEPTIC SHOCK
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INTRODUCTION. In critical ill patients glutamine becomes an essential amino acid with increased turnover and release from peripheral organs. This mechanism is supposed to play a major role in regulating catabolism in patients with septic shock. The aim of this study was to investigate the influence of a glutamine enriched total parenteral nutrition (TPN) on whole body catabolism in these patients.
METHODS. A prospective randomized trial on 30 Patients who fulfilled the criteria of septic shock (ACCP/SCCM) was performed. Patients were randomly assigned to receive 5 days of TPN with either a glutamine enriched amino-acid solution for parenteral nutrition or an isonitrogenous isosmotic standard amino acid solution (Glamm® 30% [G] and Intralip® 10% [I]), respectively. TPN was adjusted to the individual energy expenditure documented by indirect calorimetry. Using the stable isotope dilution technique area production [15N]-area and endogenous glucose production rate [14C]-rate were measured. Protein breakdown was calculated using the equation by Shaw [3]. Patients were excluded if renal failure was present or developed throughout the investigation.
RESULTS. 6 patients had to be excluded because of death or renal failure (2.0 and 4.1). There were no differences concerning gender, age, body mass index and severity of their disease (sepsis score). A ANOVA with subsequent Tukey was performed for statistical testing.

CONCLUSION. In contrast to previous data [2] neither of the two TPN regimen was able to reduce protein catabolism in patients with septic shock. The time dependent endogenous glucose production rate is probably caused by the nutritional support with glucose and the concomitant insuline suppletion.

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ENTERAL NUTRITION-RELATED INTRA-ABDOMINAL PRESSURE IN CRITICALLY ILL PATIENTS
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INTRODUCTION. Enteral feeding is often used in critically ill patients, gastrointestinal intolerance is probably the most important factor that limits its use. Our objective was to evaluate the relationship between enteral feeding tolerance and intra-abdominal pressure (IAP).
METHODS. A total of 42 patients admitted to the intensive care unit (ICU) and receiving enteral nutrition were enrolled prospectively in the study, 32 had medical diseases and 10 had intraabdominal abdominal surgery. All patients were followed until discharge from, or death in, the ICU. Acute Physiology and Chronic Health Evaluation II (APACHE II) score, IAP and sagittal abdominal diameter (SAD) were recorded at admission. Every six hours we recorded IAP, expressed as mL of administered distilled water at a constant hydrostatic gastric residue (> 200 mL/h), temporary stop of the infusion by intolerance, use of benzodiazepines, opiates and prokinetic agents. The patients outcome were also registered. In 37 patients the nasogastric tube was the method of feeding in 5 was a needle-cather jejunostomy tube. Significant differences were assessed by Student’s and chi-square tests.

RESULTS. The first IAP before the beginning of the enteral feeding was 7.3 ± 3.4 mmHg in the patients with medical disease and had an initial IAP of 8.1 ± 2.9 mmHg, in the surgical patients was 10.1 ± 3.1 mmHg (p = 0.000). Admission APACHE II was 18.2 ± 6.7 in medical patients and 13.7 ± 4.0 in surgical patients (p = 0.05). The SAD was 9.9 ± 1 cm in medical patients and 10.1 ± 1.3 cm in surgical patients (p = 0.05). At the time of successful enteral feeding tolerance (chole test = p < 0.005). The observed mortality rate was 28.6% (12 patients), the mean IAP was 8.3 ± 2.8 mmHg in survivors and 7.5 ± 3.0 mmHg in nonsurvivors (p = 0.05). The enteric nutrition intolerance was higher in patients with 11 patients died among the 19 who tolerate diet compared with 1 dead among the 2 who failed. The successful enteral feeding tolerance (chole test = p < 0.005).

CONCLUSION. In critically ill patients there is a relationship between enteral feeding tolerance and IAP (the higher IAP the worse tolerance). Enteral nutrition intolerance has a prognostic value in these patients. IAP could be an easy parameter to control the tolerance to enteral feeding.

G ERSNER, G. et al. 13th Congress of the European Association for Parenteral and Enteral Nutrition, 1999.
TREATMENT EFFECT OF EARLY ENTERAL VERSUS PARENTERAL NUTRITION: A META-ANALYSIS
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INTRODUCTION. Review studies have suggested that early enteral nutrition (EN) may be of advantage compared with parenteral nutrition (PN) [1]. Meta-analytic techniques are used to address this issue.

METHODS. Prospective randomised controlled trials (RCT) comparing early EN with PN were identified by Medline search [1996–2001] and bibliographic review of relevant articles. Primary outcomes addressed were mortality, hospital length of stay (HLOS) and patient comorbidity (all complications, infections and deaths). Exclusion criteria included non-RCT, use of immunonutrition, PN compared with standard care and studies reporting only physiological variables. Treatment effects were expressed as risk difference (RD, percent), PN vs EN) for binary events and weighted mean difference for HLOS. Publication bias was identified by funnel plot and the quantitative methods of Begg, Egger and “trim and fill”. Modification of treatment effect was assessed by meta-regression (p > 0.5) or medical/surgical sub-group analysis.

RESULTS. Of 47 potential controlled trials, 26 fulfilled inclusion criteria. Study size ranged from 18 to 257 total patients, over the years 1980–2001. Mean(SD) Ti did not differ between EN and PN (21.6(22.2) vs 27.15(9)), p < 0.01. Funnel plot inspection suggested publication bias, not identified by the Begg or Egger test. “Trim and fill” methodology suggested one potential missing study, but point estimate for mortality was not changed. No modification of mortality treatment effect was suggested by meta-regression (p > 0.5) or medical/surgical sub-group analysis.

Primary Outcome analysis

CONCLUSION. EN was associated with a statistically and clinically significant reduction in complications and HLOS compared with PN. No mortality effect was observed. Diarrhoeal episodes significantly increased with EN.

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TREATMENT OF SEVERE SEPSIS AND SEPSECTIC SHOCK USING RECOMBINANT ACTIVATED FIBRINOLYTIC ENZYME: A RANDOMIZED, DOUBLE-BLIND, PLACEBO-CONTROLLED CLINICAL TRIAL
Debaki B, Sarker MK, Roy AK, Sarker SC, Mandal AB, Baubra MJ, Sabharwal S, Hazarika A, Roy AK, Roy CC, Hazarika A, Hazarika K, Sinha J, Acar SK, Bandyopadhyay A, Patnaik AK, Sarker SC, Hazarika A, Hazarika A, Basu SK, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazarika A, Hazara...
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28-DAY MORTALITY IN PRIMARY AND SECONDARY ACUTE RESPIRATORY DISTRESS SYNDROME

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INTRODUCTION. Until now, in most studies, all patients with the acute respiratory distress syndrome (ARDS) have been analysed together. Although some studies have suggested that primary and secondary ARDS have different outcomes, it is usually considered that those different outcomes are depend from different severity of illness in both groups. The objective of this study is to compare the 28-days all cause mortality in patients with primary and secondary ARDS, controlling for the severity of illness.

METHODS. The study used the database of the Unidade de Cuidados Intensivos Polivalente, Hospital de St. António dos Capuchos. All patients admitted from July 1, 1991 to June 30, 2000 with a diagnosis of ARDS were studied. ARDS was defined according to the American-European Consensus Conference definitions (1). The ARDS was considered primary when resulted from primary lung injury (e.g. bacterial pneumonia, aspiration, near-drowning) and secondary when the lung was affected in the context of a non-pulmonary disease (e.g. abdominal sepsis, pancreatitis). Severity of illness as analysed by the APACHE II score (2) and the SAPS II score (3). The outcome measure used was vital status at 28 days. The Kaplan-Meier method was used to plot the survival curves for primary and secondary ARDS, and the log-rank test to compare the survival curves in the two populations. All data is presented as mean ± SD, except when indicated otherwise.

RESULTS. In the analysed cohort (n = 142), no differences where apparent in the baseline severity of illness, as measured by the APACHE II score (primary ARDS 24.53 ± 6.76, secondary ARDS 25.98 ± 11.94, p = 0.365) or by the SAPS II score (primary ARDS 52.71 ± 16.25, secondary ARDS 57.68 ± 25.33, p = 0.377). However, 28-days all cause mortality was significantly different in both groups (primary ARDS 55.24%, secondary ARDS 69.23%, p = 0.01). Both survival curves began to separate early in the course of the disease and this difference was still clear at 28-days (p < 0.01).

CONCLUSION. At least in this sample, primary and secondary ARDS present a very different mortality at the 28-days in the ICU, which is not captured by general outcome prediction models such as the APACHE II and SAPS II. These results seems to indicate the need for other methods of risk evaluation and stratification in this population, when we need an unbiased evaluation of the underlying patient severity.

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SEVERITY STRATIFICATION IN THE ACUTE RESPIRATORY DISTRESS SYNDROME: SPECIFIC VERSUS GENERAL INSTRUMENTS

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INTRODUCTION. Several methods have been proposed for severity stratification in patients with the acute respiratory distress syndrome (ARDS). Of these, the Lung Injury Score (LIS), proposed by Murray et al. is the most commonly used (1). The objective of this work is to compare the LIS with two general outcome prediction models, the APACHE II (2) and the SAPS II (3) for risk stratification in patients with ARDS.

METHODS. The study used the database of the Unidade de Cuidados Intensivos Polivalente, Hospital de St. António dos Capuchos. All patients admitted from July 1, 1991 to June 30, 2000 with a diagnosis of ARDS were studied (n = 142). The three instruments (LIS, APACHE II and SAPS II were computed according the original descriptions, using the worst values during the first 24 hours in the ICU. ARDS was defined according to the American-European Consensus Conference definitions (4). Outcome measure used was vital status at hospital discharge. All data is presented as mean ± SD, except when indicated otherwise. The discriminative capability of the scores was evaluated through the use of the Area under the Receiver Operating Characteristics (ROC) curve.

RESULTS. In the analysed patients, mean APACHE II was 23.17 ± 7.50. Mean SAPS II 50.22 ± 16.54 and mean LIS 2.59 ± 0.45. Overall hospital mortality rate was 71.1 %). APACHE II and SAPS II presented significantly higher values in non-survivors than in survivors (APACHE II: 25.42 ± 6.66 versus 17.66 ± 5.80, p < 0.001; SAPS II: 54.40 ± 15.70 versus 39.97 ± 14.05, p = 0.001). This was not true for LIS (2.63 ± 0.42 versus 2.49 ± 0.51, p = 0.15). The area under the ROC curve was significantly higher for SAPS II and APACHE II than for LIS (APACHE II: 0.800 ± 0.062, SAPS II: 0.737 ± 0.047, LIS: 0.501 ± 0.062).

CONCLUSION. At least in this sample, the performance of the general outcome prediction models (APACHE II and SAPS II) was significantly higher than the LIS. These results suggest that they should be used when we need to perform severity stratification in patients with ARDS. The exact role for disease-specific scores, such as the LIS, should be object of further research.

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