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AKI / ARF / SIS - Miscellanea of mechanical ventilation, AKI and sepsis

001611

The outcome of Acute kidney injury in the intensive care unit of A sub Saharan Tertiary Hospital

M. Oladimeji[1], G. Asiyanbi[2], A. Fadeyi[3], O. Belle[4], S. Olanipekun[3], O. Adekola[5]
[1]Anesthesia & intensive care unit, Lagos University Teaching Hospital, LAGOS, Nigeria, Federal Republic of; [2]Anaesthesia & intensive care, Lagos University Teaching Hospital, LAGOS, Nigeria, Federal Republic of; [3]Intensive care unit, Onelife Hospital, LAGOS, Nigeria, Federal Republic of; [4]Surgery, Lagos University Teaching Hospital, Lagos, Nigeria, Nigeria, Federal Republic of; [5]Intensive care unit, Onelife Hospital, LAGOS, France
Correspondence: O. Adekola
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INTRODUCTION. Acute kidney injury is characterized by sustained rise in serum creatinine and reduction in urine output. It may also be accompanied by retention of nitrogen products and electrolyte disturbances. The incidence of AKI varies between 36 and 67% among critically ill patients with a mortality rate of 50 to 70%.
OBJECTIVES. We determined the incidence and outcome of acute kidney injury in critical care patients
METHODS. A total of 177 patients, 18 years and older were studied. Data were collected on admission and daily during hospitalization until discharge or death. AKI was defined as:1-2 1) absolute increase in serum creatinine ≥0.3 mg/dL or ≥1.5 times the baseline level, or 2) requirement for renal replacement therapy, or 3) oliguria defined as urine output <400 ml in 24 hours
RESULTS. AKI was observed in 34.3% of our ICU admission, among of whom 4.7% developed AKI during their ICU stay. The mean duration of onset of AKI was 1 (25th to 75th percentile 1-2) days. The overall ICU 30 days mortality was 42.4%, however the 30 days mortality in patients with AKI was 85.5%. Renal replacement therapy was only possible in 36.6% patients. Inotropic support was administered in 59.1% patients with AKI. Factors mitigating against dialysis included proctated hypotension in 63.6%, lack of fund in 18.1%, delayed screening for HIV and Hepatitis B in 18.3%.
CONCLUSION. Acute kidney injury is a common problem in the critically ill patient and is associated with a high mortality rate at our institution.

REFERENCE(S)

1. Mehta RL, Kellum JA, Shah SV, Molitoris BA, Ronco C, Warnock DG, et al. Acute Kidney Injury Network: report of an initiative to improve outcomes in acute kidney injury. Crit Care 2007; 11: R31.
2. Uchino S, Doig GS, Bellomo R, Morimatsu H, Morgera S, Schetz M, et al. Diuretics and mortality in acute renal failure. Crit Care Med 2004; 32: 1669-1677.

000742

Acute kidney failure in the post operatory of peripheral vascular surgery, a prospective single- center experience

GL. Valente, BMN. Lucena, SRS. Fonseca, LMDS. Malbouilsson, MJC. Carmona
Department of anesthesiology, Faculty of Medicine, University of São Paulo, São Paulo, Brazil
Correspondence: G.L. Valente
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INTRODUCTION. Acute kidney failure (AKF) is identified in 30-40% of cases in post-operative patients. There is limited literature on the importance and the correlation between peripherical vascular surgeries and the development of AKF.
OBJECTIVES. Analysis of the connection between factors related to AKF or acute-on-chronic-kidney failure (AOCKF) in the ICU during the first 7 days after peripherical vascular surgeries, for example: arterial bypasses, amputations, angioplasties and embolectomies.
METHODS. The definition of AKF is defined by the AKIN: abrupt increase in serum creatinine ≥ 0.3 mg/dL or 50% from the baseline. This study is prospective, observational and non-randomized. Patients on previous dialysis were excluded. Continuous variables were summarized as medians and ranges, and categorical variables as percentages.
RESULTS. A database of 65 patients was evaluated. The data was acquired between April 2018 and March 2019. The median age was 70 (range 22-88 y); 73% were male. 25 patients (38%) had AKF.
The average age in both groups is similar, as well the prevalence of comorbidities (hypertension and DM), distribution of sexes and mortality. 46% of the patients with chronic-kidney disease developed an AOCKF (28% of the AKF group). The frequencies of the following values are bigger in AKF group: Re-surgery, emergency surgery, use of vancomycin, gentamicin or amikacin.
CPK values were different in the two groups (4332 AKF; 2937 no AKF), but our sample was inconclusive to demonstrate a real correlation with AKF. When CPK in the first 24h was divided in three categories (<10.000; 10000-20000 and >20000), it was observed in a Kaplan Meier analyses a correlation between these categories and post-operative hemodialysis.
CONCLUSION. Despite our small sample, CPK when analyzed as a categorical variable, showed a statistical significance in patients submitted to hemodialysis. Despite differences in both groups, as CPK average as well as further factors related to a more serious condition; like patient urgency surgery, re-surgery and the use of antibiotics; our analysis was inconclusive to stablish those factors as predictive

5.75), lower PaCO2 (OR, 0.90; 95% CI 0.83–0.98) and higher PR (OR, 1.03; 95% CI 1.01–1.05) are associated with progression of respiratory acidosis after NMBA infusion.
CONCLUSION. Emphysema, higher pH, lower PaCO2 and higher PR are risk factors for post-NMBA respiratory acidosis. It suggested patients with respiratory failure who showed active cardiopulmonary compensation especially in those with emphysema might have a risk for a progression of respiratory acidosis after muscle paralysis.

000931

Residual alveolar overdistension and collapse at electrical impedance tomography-guided positive end-expiratory pressure in patients with and without ARDS

T. Becher[1], M. Dargvainis,[1], D. Hassel,[1], N. Weiler,[1], I. Alkatout,[2], H. Ohnesorge,[1], I. Frerichs,[1]
[1]Klinik für anästhesiologie und operative intensivmedizin, Universitätsklinikum Schleswig-Holstein, Campus Kiel, Kiel, Germany; [2]Klinik für gynäkologie und geburtshilfe, Universitätsklinikum Schleswig-Holstein, Campus Kiel, Kiel, Germany
Correspondence: T. Becher
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INTRODUCTION. Electrical impedance tomography (EIT) can assess alveolar overdistension and collapse during a decremental positive end-expiratory pressure (PEEP) trial in mechanically ventilated patients [1]. Using this approach, it is possible to identify the "best compromise" PEEP at which overdistension and collapse are minimized as shown in patients with acute respiratory distress syndrome (ARDS) [2] and in patients during general surgery [3]. However, even with the "best compromise" PEEP, a variable amount of simultaneous overdistension and collapse remains. We hypothesized that the sum of overdistension and collapse detected by EIT at the "best compromise" PEEP is higher in patients with ARDS than in lung-healthy control patients during general surgery and might be a marker of disease severity.
OBJECTIVES. To investigate whether the sum of residual overdistension and collapse at the "best compromise" PEEP is higher in patients with ARDS than in patients without pulmonary pathology.
METHODS. We compared EIT data sets of 12 patients with ARDS (5 female, age: 67±11 years, height: 174±9 cm, weight: 79±22 kg, PaO2/FiO2 at baseline: 151±38 mmHg) to 8 patients without pulmonary pathology (all female, age: 38±19 years, height: 169±5 cm, weight: 77±21 kg) undergoing general anesthesia for laparoscopic gynecological surgery. Decremental PEEP trials were carried out in all patients during pressure-controlled ventilation with constant driving pressure. In control patients, one PEEP trial was performed after induction of general anesthesia in the supine position and another one during capnoperitoneum in the Trendelenburg position. All PEEP trials were analyzed as described in [1] and "best compromise" PEEP was defined as the value associated with equally balanced overdistension and alveolar collapse. Residual overdistension and collapse was calculated as the sum of overdistension and collapse at the "best compromise PEEP". Data sets were compared by one-way analysis of variance with Bonferroni post test. Written informed consent was obtained from control patients and from the legal representatives of ARDS patients. Numerical values are presented as mean±SD.
RESULTS. In ARDS patients, we identified 14.5±7.1% of residual overdistension and collapse at the "best compromise" PEEP of 13.3±2.4 mbar. In control patients, the sum of residual overdistension and collapse was 6.3±3.8% at the "best compromise" PEEP of 7.3±2.4 mbar in supine position and 3.4±3.5% at 18.0±2.1 mbar in the Trendelenburg position with capnoperitoneum. The difference between ARDS and lung-healthy patients was statistically significant both for supine ($p<0.01$) and Trendelenburg positions ($p<0.001$).
CONCLUSION. Our preliminary results imply that the sum of residual alveolar overdistension and collapse at the "best compromise" PEEP level is higher in patients with ARDS than in control patients both during ventilation in the supine and in the Trendelenburg position with capnoperitoneum. This supports the hypothesis that this measure might serve as a marker of disease severity in mechanically ventilated patients.

REFERENCE(S)

[1] Costa et al., Intensive Care Med (2009) DOI: 10.1007/s00134-009-1447-y
[2] Heines et al., J Clin Monit Comput (2018) DOI: 10.1007/s10877-018-0164-x
[3] Pereira et al., Anesthesiology (2019) DOI: 10.1097/ALN.0000000000002435

000933

Development and characterisation of novel animal models of Acute Respiratory Distress Syndrome (ARDS) endotypes

K. Wildi[1], J. Millar[2], N. Bartnikowski[1], S. Pedersen[1], N. Obonyo[1], G. Li Bassi[1], S. Colombo[1], S. Rozencwajg[1], M. Bouquet[1], D. McAuley[2], A. Pesenti[3], J. Suen[1], L. Pugh[4], J. Fraser[1]
[1]CCRG, Clinical Sciences, The Prince Charles Hospital, Chermside, Australia; [2]Institute of experimental medicine, Queen's University Belfast, Belfast, United Kingdom; [3]Policlinico, Policlinico of Milan, Milano, Italy; [4]Medicine, St Andrew's War Memorial Hospital, Spring Hill, Australia
Correspondence: K. Wildi
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INTRODUCTION. Acute Respiratory Distress Syndrome (ARDS) still remains a serious pulmonary condition with substantial mortality and without specific therapeutic options. Retrospective analysis of randomized controlled trials have identified the presence of two distinct phenotypes, based on clinical and biological variables (1–3), namely a hypo-inflammatory (P1) and a hyper-inflammatory (P2) endotype. The development of clinically relevant models to replicate these endotypes, will likely enable better understanding of these endotypes.
OBJECTIVES. We aimed to develop an ovine model of P1 and P2 ARDS endotypes and to characterize clinical and biological features, opening the pathway for further prospective evaluation of endotype-specific treatment options.
METHODS. We studied 20 anesthetized sheep on mechanical ventilation up to 6 hours, and randomized into three distinct groups: 1) the oleic acid (OA) only group received an intravenous infusion of OA to achieve a PaO2/FiO2 ratio <100 mmHg (n=8); 2) the OA-IV-LPS group received an OA infusion and intravenous infusion of lipopolysaccharide (n=5) and; 3) the OA-IP-LPS group received an OA infusion and intrapulmonary infusion of LPS (n=7). Pulmonary, hemodynamic and laboratory parameters were assessed hourly. In addition, interleukin (IL) -6, -8 and -10 were quantified in serum and bronchoalveolar lavage (BAL).
RESULTS. Severe impairment in PaO2/FiO2 ratio was found in all study groups (Figure 1). We found a) more hemodynamic and pulmonary impairment b) decreased albumin and platelets levels and c) upregulation of inflammatory (IL-6 and IL-8) and anti-inflammatory cytokines (IL-10) in serum and BAL only in OA-IV-LPS in comparison with the other two groups.
Therefore, the OA-IV-LPS model may mimic a pattern closest to the human P2 endotype and the OA only model the P1 endotype.
CONCLUSION. We developed innovative models of ARDS that mimic clinical and inflammatory status of human P1-P2 endotypes, while characterized by similar severity of pulmonary dysfunction. These animal models could be applied to explore in detail mechanical and biological differences between ARDS subphenotypes and identify endotype-specific treatment options.

REFERENCE(S)

1. Delucchi K, Famous KR, Ware LB, Parsons PE, Taylor Thompson B, Calfee CS. Stability of ARDS subphenotypes over time in two randomised controlled trials. Thorax. 2018;73:439-445.
2. Famous KR, Delucchi K, Ware LB, et al. Acute respiratory distress syndrome subphenotypes respond differently to randomized fluid management strategy. American Journal of Respiratory and Critical Care Medicine. 2017;195(3):331-338.
3. Calfee CS, Delucchi K, Parsons PE, Taylor B, Ware LB, Matthay MA. Latent Class Analysis of ARDS Subphenotypes: Analysis of Data From Two Randomized Controlled Trials. Lancet Respir Med. 2014;2(8):611-620.
4. The Prince Charles Hospital Foundation

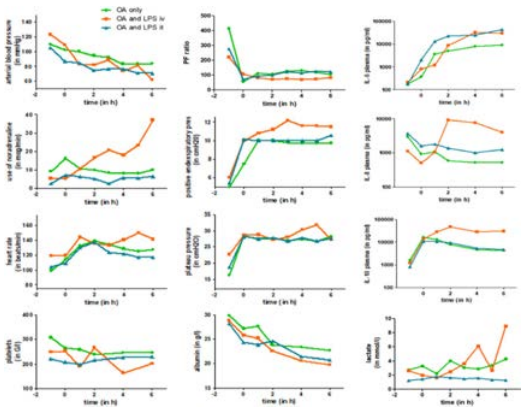

Fig. 1 (abstract 000933). See text for description

admission might suggest a specific role for injurious spontaneous breathing. Early identification of patients at risk for late intubation might prompt prophylactic interventions.

REFERENCE(S)

[1] L. Brochard, A. Slutsky, and A. Pesenti, "Mechanical Ventilation to Minimize Progression of Lung Injury in Acute Respiratory Failure," Am. J. Respir. Crit. Care Med., vol. 195, no. 4, pp. 438–442, Feb. 2017

[2] A. Delbove, C. Darreau, J. F. Hamel, P. Asfar, and N. Lerolle, "Impact of endotracheal intubation on septic shock outcome: A post hoc analysis of the SEPSISPAM trial," J. Crit. Care, vol. 30, no. 6, pp. 1174–1178, Dec. 2015.

Table 1 (abstract 000946). See text for description

	Sepsis/septic shock at the admission	No intubation	Early intubation	Late intubation	P value
Organ failure at admission, N (%)					
0	53 (3%)	29 (13%)	19 (2%)	5 (1%)	<0.0001
1	235 (16%)	77 (37%)	110 (12%)	48 (14%)	
2	314 (22%)	51 (24%)	199 (22%)	64 (18%)	
>2	823 (57%)	51 (24%)	550 (62%)	222 (65%)	
GCS, median [IQR]	15 [10-15]	15 [15-15]	14 [9-15]*	14 [10-15]*	<0.0001
SAPS II, median [IQR]	48 [36-63]	35 [25-47]	50 [37-65]*	52,5 [40-67]*	<0.0001
SOFA, median [IQR]	8 [5-12]	6 [3-8]	9 [6-12]*	10 [6-13]*	<0.0001

*p<0,05 vs No intubation group

000946

Early factors associated with increased risk for intubation in spontaneously breathing patients with sepsis and septic shock

I. Marongiu[1], T. Mauri[1], E. Carlesso[1], A. Rundo[2], A. Luzi[2], F. De Sanctis[2], S. Spadaro[3], A. Bellonzi[3], S. Bertacchini[3], A. Sicignano[1], M. Savioli[1], G. Grasselli[1], E. Spinelli[1], A. Pesenti[1]

[1]Department of anesthesiology, Fondazione IRCCS Ca'Granda Ospedale Maggiore Policlinico, Milano, Italy; [2]Department of anesthesiology, Ospedale di Belcolle, Viterbo, Italy; [3]Department of anesthesiology, Ospedale Sant'Anna, Ferrara, Italy

Correspondence: I. Marongiu

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INTRODUCTION. Systemic inflammation and metabolic acidosis, which characterize patients with sepsis and septic shock, can increase the spontaneous respiratory drive and effort and the risk of patient self-inflicted lung injury, with potentially detrimental effects on outcome[1]. A retrospective study reported that septic shock patients intubated during their intensive care unit (ICU) stay had fewer 28-day alive without organ support, as compared to patients already intubated upon admission[2].

OBJECTIVES. To compare ICU mortality in a large cohort of patients with sepsis/septic shock classified as: already intubated upon admission (early intubation) vs. intubated during ICU stay (late intubation) vs. never intubated (no intubation). To identify early factors associated with risk for late intubation.

METHODS. We included 1425 patients with sepsis (824) and septic shock (601), consecutively admitted to three tertiary level general ICUs in Italy between 2014-2018. Patients data and outcomes were prospectively collected in a centralized clinical registry (PROSAFE Giviti electronic case report form). Categorical variables are expressed as counts (%) and compared with Chi-square or Fisher's exact test. Median (IQR) was used for continuous variables and differences in distributions were assessed by ANOVA on ranks with Dunn's post-hoc test.

RESULTS. Patients with late intubation were 339 (24%), early intubation 878 (61%), no intubation 208 (15%). Patients in the late intubation group had significantly higher hospital mortality than patients in the other two groups (47% late vs. 31% early vs. 10% no, p<0.0001). Table 1 shows differences between groups at ICU admission: patients with late intubation presented more organ failures, lower GCS, higher SOFA and SAPS II scores in comparison to no intubation

In patients with late intubation, upon admission, we also observed significantly lower oxygenation, more severe acute kidney injury, higher bilirubinemia, lower systolic pressure, higher imbalance of acid-base status vs. no intubation (p<0.01 for all). Interestingly, early clinical and physiologic derangements were similar between late vs. early intubation groups.

CONCLUSION. Mortality of ICU patients with sepsis and septic shock is significantly higher when intubation occurs after ICU admission. Comparable baseline severity with patients already intubated at

000952

Bronchoscopy bronchoalveolar lavage in mechanically ventilated patients in the prone position with Acute Respiratory Distress Syndrome

A. Estella[1], M. Gracia Romero,[1], M. Perez Ruiz[1], L. Fernadez Ruiz[1], B. Diez Del Corral[1], S. Moreno Cano[1], B. Gimenez Beltrán[1], M. Recuerda Nuñez,[2]

[1]University hospital of jerez., Intensive care unit, Jerez, Spain; [2]Medicina intensiva, University Hospital of Puerto Real, Puerto Real, Spain

Correspondence: A. Estella

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INTRODUCTION. Mechanical ventilation in prone position has demonstrated to decrease mortality in patients with severe Acute Respiratory Distress Syndrome (ARDS). It is scarcely documented in the literature clinical experience about use of fiberoptic bronchoscopy (FOB) in prone position , only 9 patients, (1,2). Bronchoalveolar lavage in these conditions are exceptional.

OBJECTIVES. The aim of the present study are: to describe the clinical experience in the realization of FOB in critically ill patients ventilated in prone position and to analyze the complications related to the procedure.

METHODS. Retrospective study performed in an medical-surgical ICU. Time of study was five years. Inclusion criteria were patients with ARDS and indication of FOB. Informed consent was requested for the performance of the procedure. The following variables were collected: Demographic data, heart rate and arterial pressure during the FOB, ICU lenght of stay, level of positive end-expiratory pressure (PEEP) and categories of ARDS according Berlin classification criteria, complications and mortality. The statistical analysis was performed using SPSS program, the quantitative variables are shown in mean ± standard deviation.

RESULTS.

11 FOB were performed during the time of study. Most of patients (81.8%) were indicated for microbiological study performing bronchoalveolar lavage. In one case it was indicated due to complete atelectasis and another case due to pulmonary hemorrhage. The procedure was performed with control pressure ventilator mode with FiO2 of 100% without modifying the previous PEEP. Table 1 shows clinical characteristics. Mean PaO2/FiO2 was 185,1 ± 52,05, resulting between 200 and 300 in 5 patients, between 100 and 200 in 5 cases and < of 100 in one. In most patients (72.7%) no complications related to FOB were observed. 18.2% developed self-limiting supraventricular tachycardia without hemodynamic impact nor needing to increase vasoactives and we observed in 9% transient hypoxemia that was corrected by removing the FOB.

CONCLUSION. In our experience the realization of FOB in patients with ARDS ventilated in prone position is a safe procedure and does not need to decrease or to withdraw the previous PEEP.