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Outcome of cardiac surgery patients with a history of connective tissue disease

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Introduction: Connective tissue diseases represent a rare, heterogeneous group of diseases that commonly impair the function of many organs.

Objectives: Aim of this study was to determine whether a history of connective tissue disease has any impact on postoperative morbidity and mortality in patients who undergo cardiac surgery under the use of cardiopulmonary bypass.

Methods: We retrospectively reviewed our electronic database of 1618 consecutive cardiac surgery patients from May 2012 to March 2016. We analyzed the postoperative outcome indices of cardiac surgical patients with a history of connective tissue disease.

Results: A total of 15 (5 females) patients were identified (group A): 12 rheumatoid arthritis, 2 ankylosing spondylitis, 1 psoriatic arthritis. Oral steroids were used in 6 and methotrexate in 3 patients. The following operations were performed (1 emergency): 8 valve surgery, 5 coronary artery bypass and 2 operations on thoracic aorta. Comparing with the rest of the cohort (group B), the study group patients: were older (69,6 ± 7 vs 65,2 ± 10), their average pre-op mean ejection fraction was 57,3 ± 10 % vs 55,6 ± 11 % and their pre-op eGFR(MDRD) was 76,2 ± 3 vs 73,7 ± 23 mL/min/1.73 m^2. Pulmonary hypertension-defined as pre-op doppler systolic pulmonary pressure > 30 mmHg-was found in 5/15 patients (36,6 % vs 22,49 %, p = 0,34). Median duration of mechanical ventilation was 11 hours for group A vs 7 hours for group B. Transfusion with > 3 red blood units was required in 5/15 (36,6 % vs 23,4 %, p = 0,36). Post-op low cardiac output syndrome developed in 2/15 (13,3 % vs 5,49 %, p = 0,43). Acute kidney injury defined by RIFLE criteria complicated 2/15 patients (13,3 % vs 15,6 %, p = 0,78). Post-op atrial fibrillation developed in 7/15 (46,6 % vs 33,6 %, p = 0,31). One patient required non invasive ventilation for post-op respiratory failure. Median ICU days were 2 in both groups. No patient of the study group developed sternal wound infection or had prolonged (>24 hours) mechanical ventilation while hospital mortality was 0 %.

Conclusions: According to the results of this single-center retrospective study, cardiac surgery procedures could be performed safely in patients with a history of connective tissue disease.

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Red cell distribution width at hospital discharge and post-hospital outcomes in ICU survivors with chronic liver disease

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Introduction: Red Cell Distribution width (RDW) is associated with mortality and bloodstream infection risk in the critically ill. In survivors of critical care with chronic liver disease (CLD) it is not know if RDW can predict subsequent risk of all-cause mortality following hospital discharge.

Objectives: We hypothesized that an increase in RDW at hospital discharge in CLD patients who received critical care would be associated with increased mortality following hospital discharge.

Methods: We performed a two center observational study of patients treated in medical and surgical intensive care units in Boston, Massachusetts. We studied 4,442 patients, age ≥ 18 years, who had chronic liver disease, received critical care between 1998 and 2012 and survived hospitalization. The exposure of interest was RDW within 24 hours of hospital discharge and categorized *a priori* as ≤13.3 %, 13.3-14.0 %, 14.0-14.7 %, 14.7-15.8 %, 15.8-17.0 % and >17.0 %. The primary outcome was all cause mortality in the 90 days following hospital discharge determined using the US Social Security Administration Death Master File. Adjusted odds ratios were estimated by multivariable logistic regression models with inclusion of covariate terms for age, race, gender, Deyo-Charlson Index, patient type (medical versus surgical), sepsis and number of organs with acute failure.

Results: The cohort patients were 62.6 % male, 21.4 % nonwhite and 35.7 % surgical. 14.9 % of the cohort had sepsis and the mean age was 59 years. Mean(SD) MELD score was 15.0(8.0). 90-day post discharge mortality was 10.3 %. RDW at hospital discharge was a robust predictor of all cause post discharge mortality and remained so following multivariable adjustment. Patients with a discharge RDW 14.7-15.8 %, 15.8-17.0 % or >17.0 % have an adjusted OR of 90-day post discharge mortality of 2.31 (95%CI, 1.16-4.62; P = 0.017), 3.24 (95%CI, 1.65-6.38; P = 0.001) or 6.06 (95%CI, 3.13-11.71; P < 0.001) relative to patients with a discharge RDW ≤13.3 %. Estimates were similar with additional adjustment for MELD score. Discharge RDW has moderate discrimination for 90-day post discharge mortality (AUC = 0.76; 95 % CI 0.74-0.78). Additionally, patients with a discharge RDW 15.8-17.0 % or >17.0 % have an adjusted OR of 30-day readmission of 1.60 (95%CI, 1.13-2.26) or 1.41 (95%CI, 1.01-1.98) relative to a discharge RDW ≤13.3 %. Finally, patients with a discharge RDW 15.8-17.0 % or >17.0 % have an adjusted OR of care facility placement of 1.50 (95%CI, 1.11-2.02) or 1.45 (95%CI, 1.08-1.94) relative a discharge RDW ≤13.3 %.

Conclusions: In CLD patients treated with critical care who survive hospitalization, an elevated RDW at discharge is a robust predictor of subsequent mortality, hospital readmission and placement in a care facility. Increased RDW at discharge likely reflects the presence of ongoing inflammation or oxidative stress which may explain the observed impact on CLD patient outcomes following hospital discharge.

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Early increase in protein intake reduces mortality in underweight critically ill patients

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Introduction: Critically ill patients with body mass index (BMI) lower than 20 kg/m^2 have worse outcomes than normal or overweight patients possibly because underweight is a marker of malnutrition. It has been suggested that in malnourished critically ill patients an early increased intake of calories and protein might improve their prognosis.

Objectives: To evaluate the impact of nutritional support, especially calories and protein, on specific outcomes - need of tracheostomy, ICU readmission, and intra-hospital mortality - in underweight critically ill patients.

Methods: Prospective, two-center, observational study, was designed to asses the effect of nutritional intake in underweight critically ill patients. All patients consecutively admitted (November 2015 to March 2016) to general intensive care units (ICU) with IMC < 20 kg/m^2 were included. Exclusion criteria were: palliative care, exclusively oral nutrition, pregnancy, life expectancy < 24 h, and ICU readmission. Patients had their nutritional intake evaluated after ICU admission between days 2 and 3 (1^{st} evaluation). Another evaluation was performed between days 5 and 7 (2^{nd} evaluation) if patient had not been discharged from ICU, was not on exclusively oral nutrition, or on palliative care. Patients were divided into groups according calorie intake (group A:< 20 kcal/kg/day; group B:≥20 kcal/kg/dia) and protein intake (group C:< 1 g protein/g/day; group D:≥ 1 g protein/kg/day). Patients were followed in the hospital until their death or discharge.

Results: The hospital mortality rate of 83 included patients was 55.4 % after 17 (10–32) days of follow-up. There was an increment in calories (19.6 ± 9.7 to ± 27.6 ± 11.2; p < 0.001) and protein (0.9 ± 0.6 to 1.33 ± 0.7; p < 0.001) intakes between 1^{st} and 2^{nd} evaluation. The caloric intake (Kcal/day) both in the 1^{st} (19.2 ± 9.2 vs. 16.3 ± 10; p = 0.189) and 2^{nd} evaluation (27.8 ± 10 vs. 27.5 ± 11.9; p = 0.916) did not differ between survivors and no survivors; there was a trend for a higher protein intake (g/Kg/day) in survivors in the 1^{st} evaluation (0.96 ± 0.56 vs. 0.69 ± 0.62; p = 0.051). Mortality did not differ according caloric intake in the 1^{st} (Table 79) and 2^{nd} evaluation. Patients who received >1 g of protein/day (Group D) in the 1^{st} evaluation (Table 79) had lower mortality than those who received less protein (Group C), but not in 2^{nd} evaluation. Frequency of tracheostomies was higher in patients who received more calories (group B) and protein(Group D) only in the 1^{st} evaluation. Multivariate logistic models confirmed (OR, 95%CI) that protein intake was negatively associated with mortality [protein intake 0.43(0.18-0.99); SAPS3 1.07(1.02-1.11)] and with need of tracheotomy [protein intake 3.06(1.03-9.07); SAPS3 0.94(0.90-9.99)] even after adjustment for illness severity. ICU readmission did not differ among groups.

Conclusion: In underweight critically ill patients an early high protein intake at ICU admission has a protective role for mortality.

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Table 79 (abstract A768). Clinical characteristics and nutritional support

	Caloric intake			Protein intake		
	Group A (<20kcal/kg) n=50	Group B (≥20kcal/kg) n=33	P	Group C (<1g protein/kg) n=48	Group D (≥1g protein/kg) n=35	P
Age (ys)	55.7±17.6	54.8±18.6	0.839	54 ± 18.4	57.3±17.3	0.409
Male (%)	32(64)	18(54.5)	0.386	32 (66.7)	18 (51.4)	0.161
SAPS 3	70.6±13.2	68.2±9	0.471	71±14.9	66±14.3	0.121
Nutric ≥ 5 (%)	25(50)	16 (48.5)	0.893	25 (52.1)	16 (39)	0.567
Tracheostomy (%)	5(10)	12(37.5)	**0.030**	5 (10.4)	12 (35.3)	**0.006**
ICU readmission (%)	6(12)	3(9.4)	0.711	6(12.5)	3(8.8)	0.729
Mortality (%)	31(62)	15(45.5)	0.138	31 (64.6)	15(42.9)	**0.049**

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Quality indicators of nutritional therapy measured by dieticians may be associate with the outcome of the critical care patient

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Introduction: Nutritional risk and malnutrition must be screened at admission in intensive care units (ICU) because these patients usually benefit from early nutritional therapy[1]. Nutritional parameters should be monitored by quality indicators (QI), but their goals and association with patient outcome are still unknown.

Objectives: To estimate the impact of malnutrition, nutritional risk and high caloric deficit on mortality at a 60 days follow-up in a general ICU population.

Methods: Consecutive adult patients who remained in the ICU for greater then 48 hours were included and prospectively followed. Data were abstracted from electronic health records (EHR) by trained ICU dietitians on their sex, age, APACHE II and baseline nutrition assessment at admission[2]. Daily nutrition information was collected on the type (i.e. EN, PN, oral, none) and amount of nutrition received (total calories) from ICU admission for a maximum of the first 7 days (EN only) unless death or discharge occurred sooner. Heavy caloric deficit occurred when < 25 % of the caloric needs was achieved in the first ICU week. Patients were followed while in hospital and their outcomes determined at 60 days after ICU admission. Online forms were elaborated to enter abstracted data with a secure web-based tool (GoogleDocs, © 2012).

Results

A total of 236 EHR were verify from 2014 to 2015 in 4 this audit, 85.6 % were screened for Nutritional risk of that 91.1 % had nutritional risk according to NRS 2002 tool[2], 85.2 % were accessed with ASPEN-ADA[3] tool, diagnosing 23.4 % of malnutrition. 91.1 % of the EHR had information on the nutrients received, heavy caloric deficit was verif in 27.4 % of the EHR with this information. Binary logistic regression evidenced risk of mortality at 60 days 8.01 times higher (95%CI 1.86 - 34.7, Wald = 7.8, p = 0.005) in patients malnourished and with heavy caloric deficit in the first ICU week at the same time when compared with patients without these two risk factors (controlled by sex, age and APACHE II). Either malnutrition or heavy caloric deficit when present increases the mortality risk in 5.83 times (95%CI 1,33 - 25.4, Wald = 5.5, p = 0.019). Nutritional risk was not related with mortality at 60 days.

Conclusion: The QI presented are potentially useful nutritional markers and could implement ICU routine, the presence of a dietitian in the multidisciplinary team can facilitate that task. The combination of malnutrition and heavy caloric deficit were relevant nutritional QI associated with ICU mortality regardless of sex, age and Apache II. More studies are needed to establish goals for these QI and to develop this field.

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