



MICRO LABS LIMITED

Dear Doctor,

Greetings from Micro Labs limited. We are happy to bring **"CRITICONNECT"** containing latest information in the field of Critical care medicine.

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Looking forward to your valuable feedback

Best Regards,
Medical Team, Micro Labs Ltd



Critically ill COVID-19 patients with Liver injury

Nearly all cases of liver damage in patients with 2019 coronavirus disease (COVID-19) find blood liver tests to be often irregular, particularly in patients with more serious illness but with considerable heterogeneity. In comparison, defects of the blood liver samples were also considered to be of questionable scientific interest.

In most trials, blood liver tests were identified in a single point of time, typically at inclusion. We therefore used our case series of the first 20 consecutive COVID-19 patients admitted to the Intensive Care Unit (ICU) at Curry Cabral Hospital in Lisbon, Portugal, to explain the temporal progression of blood liver research from March 10, 2020 onwards. Median (interquartile range (IQR)) age was 67 (52–74) years with 18 (90%) males. Median (IQR) time from symptom onset to hospital admission was 7.5 (5.5–8.5) days, and median time from hospital admission to ICU admission was 1.1 (0.7–2.1) days. All patients required invasive mechanical ventilation on ICU admission. Median (IQR) sequential organ failure assessment (SOFA) score on ICU admission and peak was 8 (7–9) and 9 (8–11), respectively. As of April 10, following a median (IQR) of 21.5 (11.2–25.4) days post ICU admission, 3 (15%) patients died of multi-organ failure, 14 (70%) were discharged to the ward, and 3 (15%) remained in the ICU. Prior to hospitalisation, neither one has reported liver failure. Both patients have at least one irregular blood liver check within the first 10 days after admission to ICU. Overtime, only median gamma-glutamyl transpeptidase (GGT), alanine transferase (ALT), and aspartate transferase (AST) showed some change from the upper normal limit (ULN) and only median GGT showed ULN 3-fold rise.

Median average GGT was admitted on day 8 after ICU. The mean value of GGT (298 vs. 125 IU / L), ALT (101 vs. 42 IU / L) or AST (72 vs. 57 IU / L) was higher in patients with peak C-reactive protein than in others ($P > 0.50$ for all comparisons). In this case series, liver injury was frequent but generally transient and non-severe. While synthetic function was largely preserved, late cholestasis was frequently observed.



Cholestasis may have been associated to the critical illness itself (inflammation), parenteral nutrition (only 2 patients required parenteral nutrition), or drug toxicity (all patients were on antibiotics, for example ceftriaxone, amoxicillin clavulanate, or azithromycin). Although cholestasis may have been multifactorial, precision in conducting the differential diagnosis was not possible.

Ultimately, exposure to modifiable variables, such as inflammatory management, timing of parenteral feeding, and avoiding medications with a lower profile of liver toxicity, may be necessary to prevent worsening of cholestasis in these patients. Further studies in critically ill patients with COVID-19 are required to understand liver damage, particularly if there is some direct viral impact on the liver cells.

Ref:

Cardoso FS, Pereira R, Germano N. Liver injury in critically ill patients with COVID-19: a case series. Crit Care 2020; 24:190.

Relationship between Right ventricular function and long-term outcome in sepsis

INTRODUCTION

Sepsis heart failure is characterized either individually or in combination by severe left ventricular (LV) systolic dysfunction, LV diastolic dysfunction and right ventricular (RV) dysfunction. The prognosis associated with myocardial instability due to sepsis is not straightforward, although there are several reports that find this disorder to be indicative of an adverse result. However, specific guidelines for diagnosing myocardial impairment linked to sepsis tend to be missing. Several research explored possible criteria that could elucidate the correlation between cardiac output and outcome in patients with extreme sepsis and septic shock, to enhance the prognosis for septic patients.

Historically, the key emphasis was on LV work, where a vector association with mortality was shown in studies. Given a current lack of data, the right ventricle may provide a key to identify a stable cardiac parameter that can be used for care guidance.

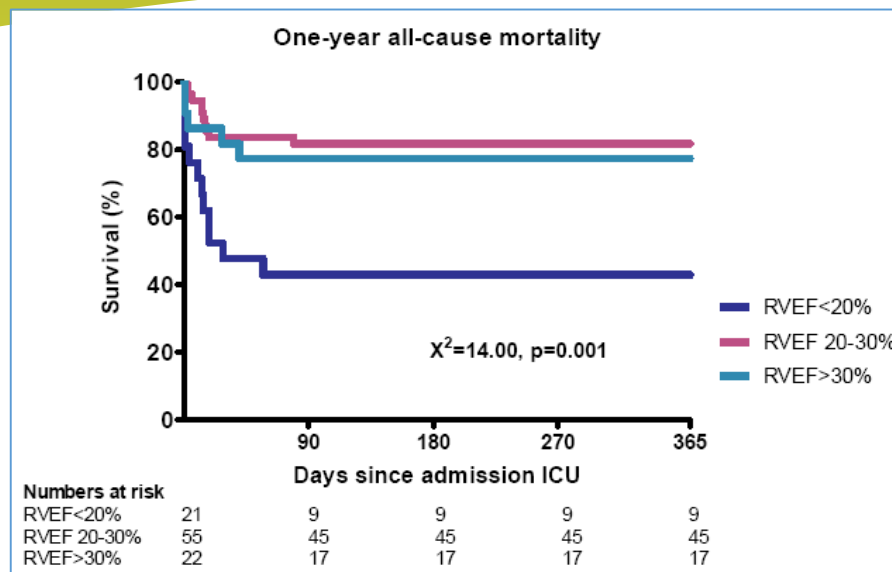
Current information on the prognostic value of right ventricular dysfunction is currently sparse. This research was aimed at assessing if the correct ventricular ejection fraction (RVEF) is indicative of long-term sepsis mortality.

METHODS

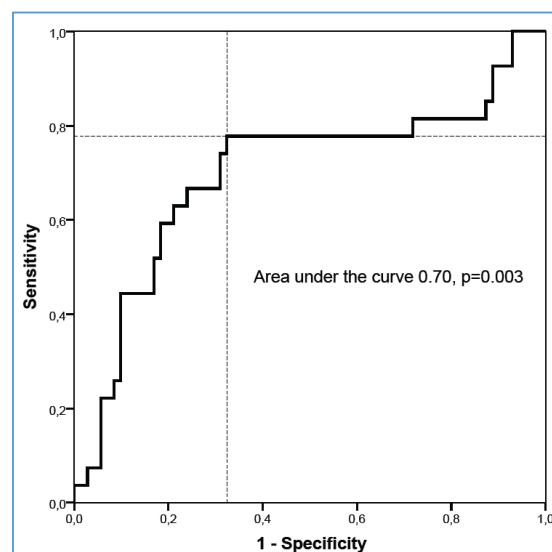
Single-centre retrospective cohort study in adult patients admitted to the ICU with severe sepsis and septic shock, and equipped with a pulmonary artery catheter within the first day following admission. RVEF was recorded as an average over the first 24 hours (sample rate of 1 per minute). Patients were separated a priori into subgroups according to their RVEF: RVEF<20% (A), RVEF 20-30% (B), and RVEF>30% (C). The primary endpoint was one-year all-cause mortality.

RESULTS

In a 7-year period, 101 patients fulfilled all entry criteria and 98 were included in the study. One-year all-cause mortality was significantly different between groups: 57% in group A (n=21), 18% in group B (n=55), and 23% in group C (n=22); $p=0.003$. Kaplan-Meier survival analysis revealed a clear separation between group A and B/C ($\chi^2=14.00$, $p=0.001$). In a multivariate logistic regression analysis RVEF, both as a categorical variable (RVEF<20%) and as a continuous variable, remained independently associated with the primary endpoint (OR 4.1; 95% CI 1.3-13.4; $p=0.018$ and OR 0.92; 95% CI 0.85-0.99; $p=0.018$ respectively).



Kaplan-Meier one-year survival analysis based on RVEF



Receiver operating characteristic curve using RVEF as discriminator of one-year all-cause mortality

CONCLUSIONS

In a selectively selective population of patients with extreme sepsis and septic shock RVEF was separately correlated with one-year all-cause mortality. Additionally, a higher RVEF has been correlated with a rise in symptoms of circulatory dysfunction, indicating sickness. Future research are required to create a possible cause-and-effect association between RVEF and mortality, and to validate possible therapeutic approaches that could gain.

REFERENCES

Winkelhorst JC, Bootsma IT, Koetsier PM, et al. Right Ventricular Function and Long-Term Outcome in Sepsis: A Retrospective Cohort Study. Shock. 2020;53(5):537-543.

Capillary leakage and Plasma volume expansion with 20% albumin in burn patients

INTRODUCTION

Albumin is the colloid substance of choice for the care of hypovolemic oedematous cases. A study between 4–5 per cent iso-oncotic and 20 per cent hyperoncotic albumin in intensive care patients revealed a fluid-sparing influence of the latter treatment, which is beneficial because oedema impairs wound healing and decreases the oxygen diffusion rate. Burn patients experience extreme oedema due to harmful fluid strain, inflammation-induced swelling of the skin, and intense fluid therapy with crystalloids. The usage of albumin is controversial.

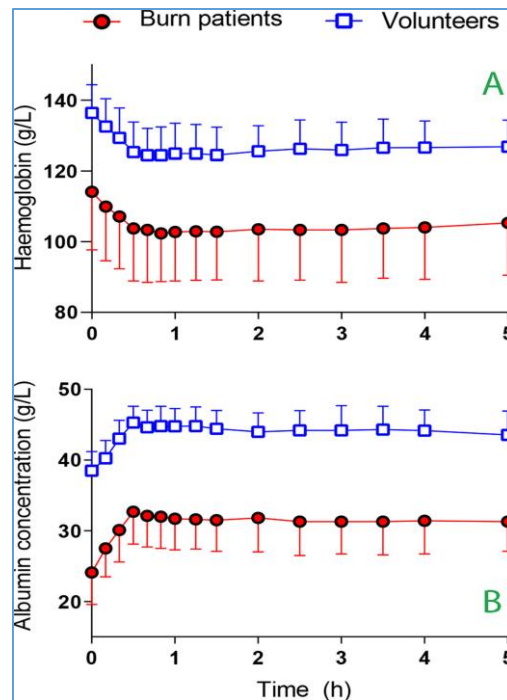
A common assumption is that injected albumin is quickly translocated to interstitial space as the damage allows the endothelium to have an inflammation-mediated toxic impact. Nonetheless, a surgical environment has scarcely evaluated the intravascular accumulation of 20 percent albumin and the resulting capillary leakage. The purpose of this research was to equate the expansion of plasma volume in burn patients with that of volunteers after administration of a standard 20% albumin material.

METHODS

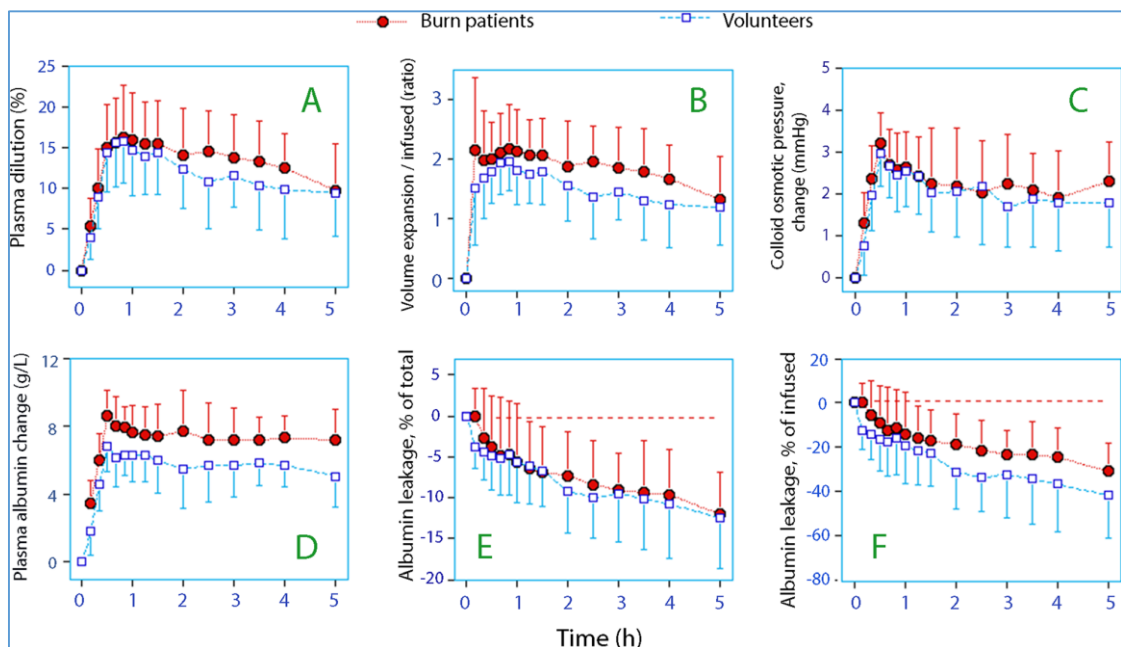
In the present open controlled clinical trial, an intravenous infusion of 20% albumin at 3 mL/kg was given over 30 min to 15 burn patients and 15 healthy volunteers. Blood samples and urine were collected for 5 h. Plasma dilution, plasma albumin and colloid osmotic pressure were compared. Mass balance calculations were used to estimate plasma volume expansion and capillary leakage of fluid and albumin.

RESULTS

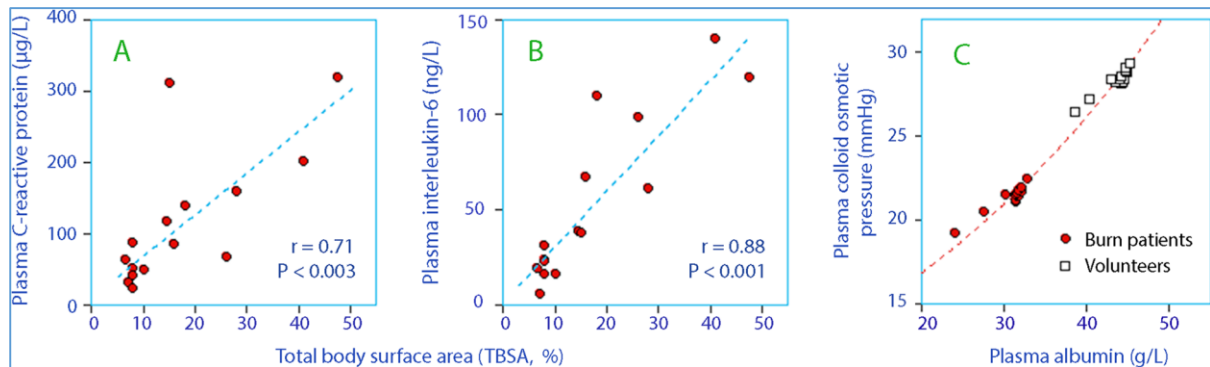
The patients were studied between 4 and 14 (median, 7) days after the burn injury, which spread over 7–48% (median, 15%) of the total body surface area. The albumin solution expanded the plasma volume by almost 15%, equivalent to twice the infused volume, in both groups. The urinary excretion exceeded the infused volume by a factor of 2.5. Capillary leakage of albumin occurred at a rate of 3.4 ± 1.5 g/h in burn patients and 3.7 ± 1.6 g/h in the volunteers ($P = 0.61$), which corresponded to $2.4 \pm 1.0\%$ and $2.5 \pm 1.2\%$ per hour of the intravascular pool ($P = 0.85$). The median half-life of the plasma volume expansion was 5.9 (25th–75th percentiles 2.7–11.7) h in the burn patients and 6.9 (3.4–8.5) h in the volunteers ($P = 0.56$).



The blood haemoglobin and b plasma albumin concentration during and after infusion of 3 ml/kg of 20% albumin over 30 min in burn patients and volunteers. Data are the mean (SD)



a. Plasma dilution. b Plasma volume expansion divided by the infused volume of 20% albumin. c Changes in plasma oncotic pressure. d Changes in plasma albumin concentration. e Capillary leakage of albumin expressed as a percentage of the total amount of albumin in the plasma and f expressed as a percentage of the infused amount of albumin. All data are the mean (SD)



Linear relationship between the burned area (as the percentage of total body surface area, TBSA) and a. the C-reactive protein concentration in plasma, and b. the interleukin-6 concentration in plasma. Each point is one patient in the burned group. C. Logarithmic correlation between plasma albumin and the plasma colloid osmotic pressure. Each point is the mean values of 15 subjects.

CONCLUSIONS

Infusion of 20 percent albumin culminated in a long-lasting increase of the plasma level, which led to twice the level infused, and urinary excretion, which was 2.5 times the volume infused. Given significant variations in inflammatory biomarkers, the efficacy was comparable in patients observed at an average of 7 days post-burn compared with safe volunteers.

REFERENCES

Zdolsek M, Hahn RG, Sjöberget F, et al. Plasma volume expansion and capillary leakage of 20% albumin in burned patients and volunteers. *Critical Care* 2020; 24:191