2021 –ANNUAL MEETING of the Belgian Society of Intensive Care Medicine (June 18, 2021) ACCEPTED ABSTRACTS

Ref 2021-1806-01

Title : Ultrasound assessment of gastric volume in critically ill patients

Authors : Vernieuwe L., De Meyer E., Marchand L., De Waele J., De Baerdemaeker L.

Institution : Ghent University Hospital

Introduction:
Patients in ICU often have delayed gastric emptying due to opioid use, chronic diseases such as diabetes or renal impairment and multi-organ dysfunction.[1] This makes existing fasting guidelines less reliable and puts them potentially at risk for aspiration of gastric content during intubation/extubation. Gastric point-of-care ultrasound (PoCUS) could be a useful tool to assess gastric content and aspiration risk in critically ill patients; however, there is limited research available that focuses on this specific patient group [1-3].

Objectives:
We wanted to investigate if the existing calculation models for estimating gastric volume are applicable in ICU patients and if we can use this model to identify patients at risk for aspiration.

Methods:
We conducted an observational cohort study in 25 adult ICU patients receiving enteral feeding by nasogastric tube. Cross-sectional area (CSA) of the antrum was measured in the semi-recumbent position before and after aspiration of gastric content and used to calculate gastric volume using a calculation model developed by Bouvet et al. [4]. Aspirated volume was correlated to measured CSA and compared to calculated volume. Gastric volumes were expressed in mL/kg, and patients with volumes >0,8 mL/kg were considered to be at high risk for aspiration.

Results:
Included patients were 50% male, with a mean age of 68 years, mean BMI of 24 kg/m2 and mean SOFA score of 6. Antral CSA measurements were feasible in 20 patients (80%). Antral CSA and total aspirated gastric volumes were moderately correlated (correlation coefficient of 0.51). There was no significant difference between the aspirated gastric volume and the calculated volume (mean 46.25 mL vs 40.48 mL; $p = 0.526$). Six out of twenty (30%) patients had gastric volumes > 0.8 mL/kg and using the calculation model we were able to identify only 3 of them.

Conclusion:
Our results show that CSA measurements are feasible in a majority of ICU patients. We were able to identify 50% of patients at risk for aspiration using the existing calculation model. Further research and validation in a higher number of patients is needed for the ICU population.

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2021 –ANNUAL MEETING of the Belgian Society of Intensive Care Medicine (June 18, 2021) ACCEPTED ABSTRACTS

Ref 2021-1806-02

Title: An observational study: The COVID-19 infected patients at ICU AZ Sint-Jan Brugge

Authors : Hermans J., Bourgeois M., Nauwynck M., Dewulf B.

Institution: AZ Sint-Jan Brugge

Introduction:
The SARS-CoV-2 pandemic overwhelmed the world with unmeasurable repercussions on modern healthcare. This severe, atypical viral pneumonia rapidly depleted intensive care resources in many countries leading to an enormous global death toll. Hence our aim to provide a detailed summary of all patients infected with the Covid-19 virus which had to be admitted to the Intensive Care Unit (ICU) in AZ Sint-Jan Brugge, Belgium.

Objectives:
This observational study reviews the demographic characteristics and management of the Covid-19 positive patients admitted to the ICU in relation to their in-hospital mortality. Methods: This retrospective, observational study was executed in a tertiary care hospital in Belgium (AZ Sint-Jan Brugge). Only adult Covid-19 confirmed infected patients which were admitted to the Intensive Care Unit (ICU) from 12/03/2020 until 03/07/2020 were included in the study cohort. Results: In total, 42 patients were enrolled in the study because of a severe Covid-19 related pneumonia. The median age was 65 years (range 28-89 years). Seventy-nine percent of the cohort population was male. The median body mass index (BMI) was 24 (range 16-42). Common comorbidities were arterial hypertension (21 out of 42; 50%), gastroesophageal reflux disease (15 out of 42; 36%), hypercholesterolemia (14 out of 42; 33%), cardiac failure/heart surgery (12 out of 42; 29%) and chronic obstructive respiratory disease (11 out of 42; 26%). The time between onset of the symptoms and admission was on average 6 days. Sixty-seven percent required mechanical ventilation. The mean duration of ventilation was 27 days. Overall in-hospital mortality was 31%. We described a higher mortality probability associated with age (4 out of 5; 80%), BMI (4 out of 5; 80%) and extensive comorbidities (9 out of 16; 56%). Chronic arrythmias showed to be an independent risk factor (6 out of 7; 86%). An acute onset of symptoms (less than 4 days) predicted a higher chance of a poor outcome (8 out of 9; 89%). Mortality in the mechanical ventilated group was 38%. A survival benefit was noted in patients receiving a tracheostomy early on (less than 3 weeks). Mortality was higher in patients receiving continuous renal replacement therapy (5 out of 6; 83%), venovenous extracorporeal membrane oxygenation (4 out of 5; 80%), continuous infusion of hydrocortisone (5 out of 6; 83%), prophylactic posaconazole in association with high-dose corticosteroids (4 out of 4; 100%) and inhaled nitric oxide (2 out of 2; 100%).

Conclusions:
Age and BMI were risk factors for a worse outcome. An extensive medical history and an acute onset of Covid-19 related symptoms contributed to a higher mortality probability. The use of continuous renal replacement therapy, venovenous extracorporeal membrane oxygenation, inhaled nitric oxide, a continuous infusion of hydrocortisone, antifungal prophylaxis in combination with high-dose corticosteroids proved to be possible mortality risk factors.

2021 –ANNUAL MEETING of the Belgian Society of Intensive Care Medicine (June 18, 2021)
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Ref 2021-1806 - 03

Authors: Vandersteen L., Carra G., Hermans G., Wouters P., Van den Berghe G., Meyfroidt G.

Institution : KU Leuven

Introduction

Coronavirus disease 2019 (COVID-19), caused by SARS-CoV-2, is associated with life-threatening respiratory and cardiovascular complications. Central nervous system manifestations, including the development of delirium, have been reported, although the underlying pathophysiology is diverse (1) and remains incompletely understood (2).

Objectives

To determine the prevalence of delirium, and to investigate risk factors associated with development of delirium the next day, in critically ill COVID-19 patients.

Methods

In this single center observational study, 114 patients admitted to the ICUs of the University Hospitals Leuven for COVID-19 disease between March 13th and June 2nd, 2020, were included. Delirium was defined on a daily basis as an Intensive Care Delirium Screening Checklist (ICDSC) score ≥4, alive, and in the absence of coma. Risk factors associated with presence of delirium the next day were investigated using a multivariable logistic regression model, including age, and factors related to the treatment of the patients during the first 14 days of ICU stay (number of days with ECMO, the use of steroids, and the average cumulative daily dose of propofol, midazolam, dexmedetomidine).

Results

Thirty-four patients (29.8%) had at least one episode of delirium. Age ($p<0.0001$) and average cumulative daily dose of steroids ($p=0.05$) were both associated with a higher risk of delirium on the next day, but the average cumulative daily dose of propofol, midazolam and dexmedetomidine were not. Even while there was a trend towards an association between risk of delirium and the number of days with ECMO, this was not statistically significant ($p=0.08$) (Table 1).

Conclusions

Delirium occurred in less than 30% of patients with COVID-19. None of the sedatives were associated with delirium on the next day. In this small single center cohort, steroids seem to be a potentially modifiable risk factor for the development of delirium, which should be balanced against their beneficial effect on mortality in selected hospitalized patients (3). The results of this study require further validation in a larger cohort of patients.

References

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Grant acknowledgment

GC is supported by the FWO, (fellowship 1S28120N), GM receives funding from the FWO as senior clinical investigator (1843118N), and project funding from the KU Leuven (C2 project (C24/17/072): A Neuromonitor for the 21st century)), and from the Belgian Health Care Knowledge Study Centre (KCE) (COV201003). GH receives funding from the FWO as senior clinical investigator (1805121N) and project funding from the FWO (G087920N) and UZ Leuven (COVID call 2020). GVdB receives structural research financing via the Methusalem programme from the Flemish Government (METH14/06) and from the European Research Council Advanced Grants Programme (AdvG-2017-785809).

Table 1. Multivariable logistic regression model assessing independent associations between risk factors and the presence of delirium the next day

Variable	Coefficient (95% Confidence Interval)	p-value
Age	0.0404 (0.0300;0.0508)	<0.0001
Steroids	0.0031 (-0.0001;0.0062)	0.05
ECMO	-0.2584 (-0.5470;0.0302)	0.08
Propofol (*)	0.0000 (-0.0000;0.0000)	0.76
Midazolam (*)	-0.0001 (-0.0069;0.0068)	0.99
Dexmedetomidine (*)	0.0000 (-0.0000;0.0000)	0.14

(*) Average daily cumulative dose up to the time of evaluation

2021 –ANNUAL MEETING of the Belgian Society of Intensive Care Medicine (June 18, 2021)
ACCEPTED ABSTRACTS

Ref 2021-1806-04

Title: Human Herpes Viridae disease in COVID-19 patients receiving IL-1 blockade

Authors: Schockaert B., Vlasselaers D., Debaveye Y.

Institution: UZ Leuven

Introduction
A subset of patients with COVID-19 develop a hyperinflammatory state which may be modulated by a recombinant IL-1 receptor inhibitor, Anakinra. Although regarded as safe with proven efficacy in several disease states, little is known about its effects in COVID-19 patients (1).

Objective
Assessing herpes viridae disease state in COVID-19 patients receiving an IL-1 receptor inhibitor.

Methods
We conducted a retrospective study of patients with COVID-19 admitted at the ICU of a tertiary care hospital in Belgium, during April and May 2020, who received a rescue scheme consisting of seven days Anakinra with concomitant use of methylprednisolone. Baseline characteristics, APACHE II, SOFA score on admission and HScore were obtained. Herpes viridae disease was defined as a major clinical inflammatory deterioration, under suitable antibiotics, with proven Human Herpes Virus (HHV) 1 or 5 (=CMV) in blood and tissue samples.

Results
In total, 4 COVID-19 patients received rescue treatment. Patient one had no evidence of herpes viridae disease. Patient two received Anakinra for 4 days, which was stopped because of liver function disorders. This patient had a positive PCR HHV 1 in BAL before the start of Anakinra. Patient three had a positive PCR HHV 1 in BAL and blood sample, the day after starting Anakinra. Over time he developed skin lesions (HHV 1 PCR positive) for which acyclovir was introduced. He died on day 26 due to hemorrhage with hemodynamic instability. Patient four, under VV ECMO, had clear evidence of herpes viridae pneumonia, 2 weeks after introducing Anakinra, based on HHV 5 PCR in BAL and blood sample and HHV 1 in BAL, with resolution of symptoms and viral load after ganciclovir treatment.

Discussion
Current evidence suggests a higher incidence of HHV 1 and 5 reactivation in COVID-19 patients, compared to immunocompetent septic patients (2). We encountered herpes viridae disease in 2 of our patients, an entity which may be predisposed by IL-1 pathway modulation. Recent research analyzed the effects of Anakinra in secondary hemophagocytic lymphohistiocytosis, in which 47% of the occurred infections were member of the herpesvirus family (3). A possible explanation may be the function of IL-1 as an alarmin in leukocyte recruitment against HHV 1 infection (4). In addition, HHV 5 inhibits IL-1 and TNF alpha via NF kB inhibition in order to escape immune response (5). These observations suggest a possible key role of IL-1 in the development of herpes viridae disease.

Conclusion
Further research is needed in order to gain insight concerning the role of IL-1 pathway modulation in the development of herpes viridae disease.

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2021 –ANNUAL MEETING of the Belgian Society of Intensive Care Medicine (June 18, 2021) ACCEPTED ABSTRACTS

Ref 2021-1806-05

Title: Impact of withholding early PN on blood glucose control in relation to outcome

Authors :Coucke C., Casaer M.P., Hermans G., Dubois J., Wouters P.J., Wilmer A., Van den Berghe G., Gunst J.

Institution: UZ Leuven

Introduction

Withholding early parenteral nutrition (PN) until 1 week after ICU admission facilitates recovery of critically ill patients as compared to early supplementation of insufficient enteral nutrition by PN (1). Early PN slightly increased mean blood glucose in ICU, but decreased the risk of hypoglycemia (1). Previous RCTs have shown that tight glucose control, in a context of providing early PN, reduced morbidity and mortality of critically ill patients, despite an increased risk of hypoglycemia (2-4).

Objectives

To study whether improved glucose control may have contributed to the outcome benefit of withholding early PN.

Methods

This is a secondary analysis of the EPaNIC RCT (N=4640), in which adult critically ill patients were randomized to early versus late PN (1). All patients received tight glucose control with insulin therapy to target 80-110 mg/dl in ICU. We studied the impact of early versus late PN on mean morning blood glucose in the intervention window (first week in ICU), and studied whether mean morning blood glucose in the first week associated with the time to live discharge from ICU, time to live weaning from mechanical ventilation, and incidence of new infections in ICU through Cox proportional hazards, respectively logistic regression analysis, first in unadjusted analysis and then adjusted for randomization and baseline risk factors (age, gender, BMI, type and severity of illness, nutritional risk score, history of diabetes).

Results

Early PN increased mean morning blood glucose in the first week in ICU (108±19 mg/dl versus 102±15 mg/dl; P<0.0001). Increased mean morning blood glucose associated with increased time to live discharge from ICU, increased incidence of infections, and increased time to live weaning from mechanical ventilation (all P<0.0001). After adjustment for baseline risk factors and randomization, increased blood glucose remained associated with impaired outcome (P<0.0001 for time to live discharge/weaning; P=0.002 for infections), while randomization to early PN only remained significantly associated with increased infectious risk (P=0.045).

Conclusions

Postponing PN until one week after ICU admission led to more successful control of blood glucose levels within the strict range. Lower blood glucose significantly associated with improved outcome, also when adjusted for baseline risk factors and randomization. Improved blood glucose control may have mediated part of the outcome benefit of withholding early PN.

References

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Grant acknowledgment

JG, and MPC and GH hold a postdoctoral research fellowship supported by the University Hospitals Leuven and the Research Foundation – Flanders, respectively. GVdB receives long-term structural research financing from the Methusalem Program of the Flemish government, via KU Leuven (METH14/06).

2021 –ANNUAL MEETING of the Belgian Society of Intensive Care Medicine (June 18, 2021) ACCEPTED ABSTRACTS

Ref 2021-1806-06

Title: Effect of PEEP on cardiac output and oxygen delivery in COVID-19 ARDS on VV-ECMO

Authors: Frederiks P., Hermans G., Wilmer A., Balthazar T.

Institution: UZ Leuven

Introduction

Critically ill patients with COVID-19 associated acute respiratory distress syndrome (CARDS) are prone to develop right ventricular dysfunction. Herein, pulmonary vascular resistance plays a prominent role.1 In respiratory extracorporeal membrane oxygenation (ECMO) supported patients, right ventricular (RV) dysfunction not only affects cardiac output (CO) but can also influence oxygenation by altering the extracorporeal blood flow to total CO (ECBF/Qt) ratio with variable effects on oxygen delivery (DO2 = CO x CaO2).2

Objectives

As the optimal ventilation strategy in ECMO patients is still debated, we aim to evaluate the heart-lung interactions and DO2 on different positive end-expiratory pressure (PEEP) levels in early CARDS with transthoracic echocardiography (TTE).

Methods

This is a single-center, prospective cohort study of COVID-19 patients admitted to a tertiary medical ICU for veno-venous ECMO (VV-ECMO) in the period between March and December 2020. Within 48 hours after admission, an extensive TTE with measurements at PEEP levels of 5, 10 and 15 cmH2O was performed. The PEEP titration was ceased in case of hemodynamic instability or significant desaturation. Baseline and clinical characteristics, together with clinical outcome variables were collected from the electronic patient records. For statistical analysis, one-way repeated measures ANOVA and Mauchly's sphericity tests in SPSS were performed, followed by a Bonferroni post hoc analysis in case of an overall significant difference in means.

Results

We included nine patients with CARDS on VV-ECMO. The mean age was 55 years (range 47-68) with a majority of male patients (78%). The mean P/F ratio before ECMO was 70+/-14 mmHg and APACHE II was 25+/-7.7. Other patients' characteristics and outcome values are listed in table 1, as are TTE results. Repeated measures ANOVA showed significant differences of mean LVOT VTI ($p=0.026$), CO ($p=0.034$), DO2 ($p=0.049$), PVAT ($p=0.002$) and RV/LV diameter ratio ($p=0.003$) between different PEEP levels. Post hoc analysis showed a significant reduction in LVOT VTI ($p=0.04$), CO ($p=0.014$) and DO2 ($p=0.011$), with increased PVAT ($p=0.008$) and RV/LV ratio ($p=0.021$) from PEEP 10 to 15 cmH2O. There was no significant difference between low and intermediate PEEP. The statistical analysis should however be interpreted with caution and viewed as exploratory due to the small sample size.

Conclusion

In VV-ECMO supported early CARDS patients, high PEEP levels showed a significant increase in RV afterload with lower CO and decreased DO2. Tailoring of PEEP should not only be based on lung mechanics but also consider its influence on CO and DO2 in these critically ill patients.

References

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2 Ficial B, et al. Membranes (Basel). 2021 Mar 22;11(3):225.

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Table 1 – overview of clinical characteristics and outcome variables

A. Patients' demographics and outcome characteristics

	Overall (n=9)
Patients' demographics	
Age, years (range)	55.2 (47-68)
Gender, male, n (%)	7 (78%)
Body mass index, kg/m^2, mean±SD	31.6±6.1
Diabetes, n (%)	3 (33%)
Smoker, n (%)	0 (0%)
Ex-smoker, n (%)	4 (44%)
Baseline characteristics	
P/F ratio before ECMO, mmHg, mean±SD	70±14
Murrey score, mean±SD	3.5±0.4
RESP score, mean±SD	3.2±1.9
SOFA score, mean±SD	11±1.7
APACHE II score, mean±SD	25±7.7
CRP on admission, mg/dl, mean±SD	157±94.8
Clinical outcome	
IMV duration, days, median (IQR)	32 (17-53)
ECMO duration, days, median (IQR)	16 (11-25)
ICU stay, days, median (IQR)	40 (20-57)
Hospital stay, days, median (IQR)	68 (31-71)
30-days mortality, n (%)	0 (0%)
90-days mortality, n (%)	2 (22%)

	Overall (n=9)
Characteristics at start of echo exam	
Heart rate, bpm, mean±SD	58±13
MAP, mmHg, mean±SD	73±8
Vasopressor, n (%)	6 (67%)
Inotropy, n (%)	1 (11%)
Hemoglobin, g/dl, mean±SD	9.9±2.9
Tidal volume, ml, mean±SD	330±89
PEEP, cmH_2O, mean±SD	9±3.3
Plateau pressure, cmH_2O, mean±SD	22±3.0
Lung compliance, ml/cmH_2O, mean±SD	26.4±11.9
Neuromuscular blocking agent, n (%)	9 (100%)
Inhaled nitric oxide, n (%)	2 (22%)
ECMO blood flow, l/min, mean±SD	3.8±0.4
ECMO sweep gas, l/min, mean±SD	4.3±2.0
ECMO access pressure, mmHg, mean±SD	-46±7
ECMO FdO2, %, mean±SD	89±15
ECMO SvO2, %, mean±SD	70.7±6.5

B. Measurements during transthoracic echocardiography

	PEEP 5	PEEP 10	PEEP 15	*F-statistic*	*P*
LVOT VTI, cm, mean±SD	23.4±4.7	22.8±5.2	20.7±5.3	F (2, 14) = 4.80	0.026
CO, l/min, mean±SD	5.3±1.4	5.4±1.7	4.9±1.4	F (2, 14) = 4.35	0.034
DO_2, ml/min, mean±SD	660±237	674±241	602±210	F (2, 14) = 3.76	0.049
PVAT, msec, mean±SD	78±18	85±16	70±17	F (2, 16) = 10.2	0.002
RV/LV ratio, mm, mean±SD	0.83±0.15	0.76±0.14	1.01±0.29	F (2, 12) = 10.0	0.003
RV S', cm/s, mean±SD	11.4±2.5	10.9±1.7	10.1±2.8	F (2, 16) = 1.51	0.249
Oxygen saturation, %, mean±SD	92.6±2.5	94.3±2.5	93.9±3.1	F (2, 16) = 2.61	0.105
Lung compliance, ml/cmH_2O, mean±SD	28.2±14.6	26.3±12.6	22.1±11.0	F (2, 16) = 2.23	0.139

Abbreviations: n, number; SD, standard deviation; bpm, beats per minute; MAP, mean arterial pressure; PEEP, positive end-expiratory pressure; RESP, Respiratory ECMO Survival Prediction; SOFA, Sequential Organ Failure Assessment; APACHE II, Acute Physiology and Chronic Health Evaluation; CRP, C-reactive protein; IMV; invasive mechanical ventilation; IQR; interquartile range; ECMO, extracorporeal membrane oxygenation; ICU, intensive care unit; LVOT VTI, left ventricular outflow tract velocity time integral; CO, cardiac output; DO2, oxygen delivery; PVAT, pulmonary velocity acceleration time; RV, right ventricle; LV, left ventricle; FdO2, fractional delivered oxygen; SvO2, mixed venous oxygen saturation.

2021 –ANNUAL MEETING of the Belgian Society of Intensive Care Medicine (June 18, 2021) ACCEPTED ABSTRACTS

Ref 2021-1806-07

Title: Impact of tight glucose control on circulating ketones in PICU

Authors: Dionys A., De Bruyn A., Langouche L., Vander Perre S., Gunst J., Van den Berghe G.

Institution: UZ Leuven

Introduction

Our research group previously demonstrated that tight glucose control (TGC) improved outcome of critically ill children as compared to tolerating stress hyperglycemia (1). Recent evidence suggests a potentially protective role of ketones in pediatric critical illness (2). The impact of lowering blood glucose on circulating ketones remains unclear. Whereas low glucose concentrations may increase lipolysis and ketogenesis, both high insulin and high circulating glucose may suppress ketogenesis. In this regard, a small crossover RCT in critically ill adults found increased ketogenesis by tight glucose control (3).

Objectives

To study whether TGC activates ketogenesis in critically ill children, and whether such effect, if present, may have contributed to the outcome benefit of the intervention.

Methods

This is a secondary analysis of a pediatric RCT that randomized 700 critically ill children to tight (50-80 mg/dl for infants, 70-100 mg/dl for children older than one year) versus liberal (<215 mg/dl) blood glucose control in ICU. All patients received early parenteral nutrition. Before studying a potential mediator role of circulating ketones through multivariable regression analysis, we performed a time course analysis, to study whether TGC significantly affected ketogenesis and to identify a day of maximal effect (if any). We quantified daily plasma 3-hydroxybutyrate (3HB) concentrations from ICU admission until day 3 in a matched subset of patients with available plasma on each study day. Patients were propensity score-matched for age, weight, sex, diagnostic category, severity of illness, and the need for assist device or ECMO upon admission to the ICU. Univariable differences between groups were investigated by Kruskal-Wallis test.

Results

Of 394 patients with ICU stay of at least 3 days, a well-matched subset of 100 patients was selected (50 randomized to TGC, 50 randomized to liberal glucose control). In the matched cohort, morning blood glucose was significantly lower at days 1-3 in TGC patients ($P<0.0001$), whereas insulin doses were significantly higher ($P<0.0001$). Throughout the study period, caloric intake did not differ between groups. Regardless of randomization, 3HB concentrations were suppressed from days 1 to 3, with >75% of samples below the detection limit of 0.04 mmol/l.

Conclusions

TGC did not significantly affect 3HB concentrations in critically ill children in the context of providing early parenteral nutrition. These data suggest that the protective effects of TGC in this context were not mediated by increased ketone availability.

References

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Grant acknowledgment

UZ Leuven postdoctoral fellowship (JG)
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SIZ BELGIAN SOCIETY OF INTENSIVE CARE MEDICINE

2021 –ANNUAL MEETING of the Belgian Society of Intensive Care Medicine (June 18, 2021) ACCEPTED ABSTRACTS

Ref 2021-1806-08

Title: Strong association of survival with improving cardiac power in cardiogenic shock

Authors: Van Hemelen M., Adriaenssens T., Vandenbriele C., Wilmer A., Rega F., Balthazar T.

Institution: UZ Leuven

Introduction

Mechanical support devices, such as Impella, are increasingly used for cardiogenic shock (CS). Mortality remains high and there is a need for early prognostication. The SHOCK and CardShock studies have identified the mechanical cardiac power output (CPO) as a predictor of survival. While some evidence supports this in patients on Impella [1], to our knowledge the predictive value of trends in CPO over time has not been examined.

Objectives

We explored hemodynamic changes over 24h after implantation, in patients with CS at our tertiary care centre, on Impella mechanical support. We compared CPO evolution in the first 24h in survivors and nonsurvivors.

Methods

Retrospective single-centre study including CS patients treated with Impella (without concurrent ECMO) from 2017-2020 in the cardiac intensive care unit.
Data originated from the electronic medical record. We calculated CPO (in W) as MAP (in mmHg) x CO (in L/min) / 451. No adjustment for Impella flows was made . All calculations used R 4.0.4, using nonparametric tests.

Results

28 patients were screened, of which 17 had sufficient data. Mean age was 68 years, 53 % were male. The cause of CS was acute MI in 12 (71 %), myocarditis in 3 (18 %), deteriorating CHF and shock after PTAV in 1 patient (6 %) each.
11/17 (65 %) required 2 or more vasoactive agents. Median initial lactate was 5.8 mmol/L (1.75 - 12.1). SCAI stages were: 9 in SCAI C, 6 in SCAI D, 2 in SCAI E.
Initial CPO values were similar: median CPO of 0.50 W (IQR 0.37-0.565 W) in survivors vs 0.53 W (IQR 0.42-0.605 W) in non-survivors (p=1.0). Survivors had a markedly higher increase after 24h: median increase of 80 % in survivors (IQR 41-105 %) vs -2.4 % in non-survivors (IQR -17-18.6 %; p= 0.0046). Improving CPO predicted survival with an AUROC of 90 %.

Discussion

We found a strong association between increasing CPO and survival in CS, treated with Impella. As device flows were unchanged after 24h, our findings suggest recovery of native cardiac performance in survivors.

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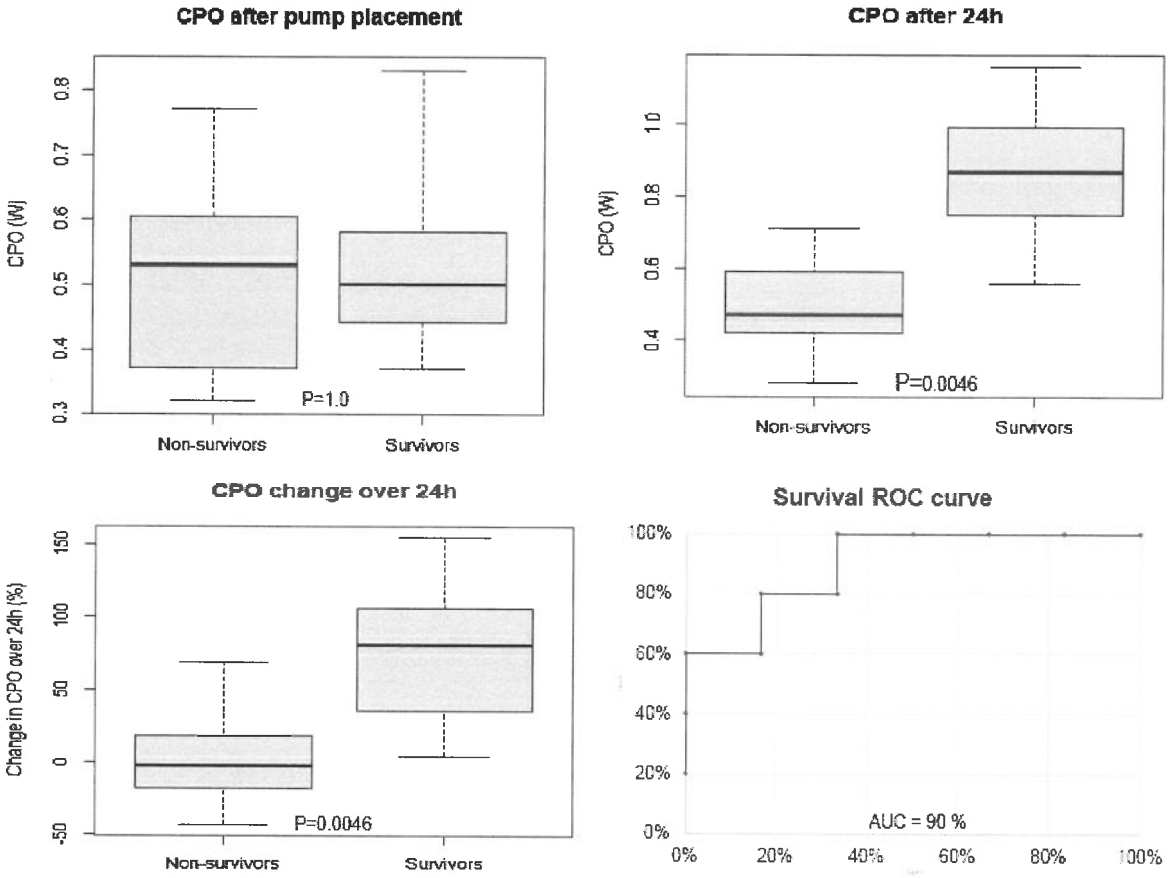
TABLE



2021 –ANNUAL MEETING of the Belgian Society of Intensive Care Medicine (June 18, 2021)
ACCEPTED ABSTRACTS

Ref 2021-1806-09

Title: The use of methylprednisolone in patients with Coronavirus Disease (COVID-19)

Authors: Hoflack S., Doucet L., Van Slambrouck L., Lormans P.

Institution: Intensive Care Medicine, AZ Delta Hospital, Roeselare

Introduction
Since the outbreak of the COVID-19 virus several treatment plans for patients with severe respiratory symptoms requiring admissions to an intensive care department were suggested. Because of the early recommendation of the WHO to avoid corticosteroids most of them excluded the use of these products and its derivatives. This was due to the fear of suppressing the immune system and a viral load shedding with a potentially fatal outcome. However, the general opinion shifted because of numerous new studies that were published recently. As proven with ARDS (Acute Respiratory Distress Syndrome), corticosteroids have the ability to reduce the inflammatory response.

Objectives
In this light, we would like to share our experience using methylprednisolone on the severe ill patients with respiratory distress due to a COVID-19 infection, requiring Intensive Care Hospitalization, and their effect on laboratory findings and PaO2/FiO2 (ratio of partial oxygen concentration on arterial blood gas sample and fraction of inspired oxygen on ventilator or non-invasive ventilation) ratio. This was performed in a longitudinal observational study.

Methods
Out of a population of 68 patients who were hospitalized at the intensive care unit due to a COVID-19 infection, 28 patients with severe respiratory failure received methylprednisolone in a fixed scheme of 12 days (125mg IV for 2 days, followed by 2x0,5mg/kg IV twice a day for 5 days followed by a declining schedule for 4 days until stop). After day 5 and day 10 we analyzed the CRP (C-reactive protein) levels, lymphocytosis, D-dimers, LDH (lactate dehydrogenase) and Pa02/FiO2 ratio of our patients.

Results
We observed a significant decrease in median CRP levels between day 0 (start of methylprednisolone treatment) and day 5 (p=0,001), and between day 0 and day 10 (p=0,005). Between day 5 and 10 (p=0,352) no decrease was found. The same increase in Pa02/FiO2 was recorded between day 0 and day 5 (p=0,009), and between 0 and day 10 (p=0,019). For D-dimers only a significant difference was found between day 0 and day 10 (p=0,018). No significant difference could be observed for lymphocytosis and LDH levels between start of treatment and day 5 or day 10.

Conclusions
There is a strong and lasting significant decrease in CRP levels and incline in PaO2/FiO2 ratio after starting methylprednisolone. A slower, but also significant decrease was found for D-dimers. Further research and control group analysis are required to confirm this effect is due to the treatment with corticosteroids. However, it does indicate that methylprednisolone could play a very important role in the treatment of the severely ill COVID-19 patients requiring ICU admission.

+ FIGURE & TABLES

Figure 1: flow chart of patient population

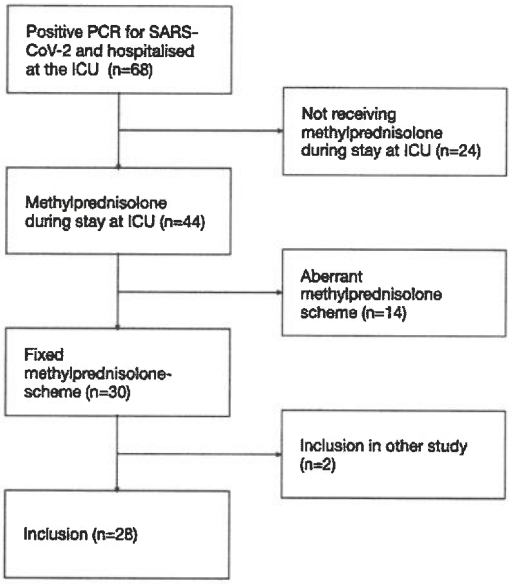


Table 1: Characteristics and clinical outcomes

Characteristics			
Gender	Male	19	67.9%
	Female	9	32.2%
BMI	Median	26	
Age	Median	66	
Type 2 Diabetes Mellitus			
	Yes	7	25%
	No	21	75%
SOFA-score when starting methylprednisolone	Median	4	
Clinical outcomes			
Survival untill hospital discharge			
	Yes	16	61.5%
	No	12	38,5%
NIV (CPAP)			
	Yes	18	64.3%
	No	10	35,7%
Intubation			
	Yes	14	50%
	No	14	50%
VV-ECMO			
	Yes	2	7,1%
	No	26	92,9%

Table 2: Biochemical outcomes and PAO2/FIO2-ratio after starting methylprednisolone (=day 0)

PaO2/FiO2	**Days**	**Median (IQR)**	**Wilcoxon Signed Rank**	**P-Value**
	PaO2/FiO2 day 0	84.40 (70.28 - 108.86)	2.603	**0.009****
	PaO2/FiO2 day 5	119.87 (82.48 - 171.65)		
	PaO2/FiO2 day 0	84.40 (70.28 - 108.86)	2.354	**0.019****
	PaO2/FiO2 day 10	102.65 (81.15 - 195.73)		
	PaO2/FiO2 day 5	119.87 (82.48 - 171.65)	1.412	0.158
	PaO2/FiO2 day 10	102.65 (81.15 - 195.73)		
Lymphocytosis	**Days**	**Median (IQR)**	**Wilcoxon Signed Rank**	**P-Value**
	Lymphocytosis day 0	0.640 (0.450 - 1.080)	1.308	0.191
	Lymphocytosis day 5	0.790 (0.4300 - 1.250)		
	Lymphocytosis day 0	0.640 (0.450 - 1.080)	1.733	0.083
	Lymphocytosis day 10	0.985 (0.475 - 2.213)		
	Lymphocytosis day 5	0.790 (0.4300 - 1.250)	2.120	**0.034****
	Lymphocytosis day 10	0.985 (0.475 - 2.213)		
D-dimers	**Days**	**Median (IQR)**	**Wilcoxon Signed Rank**	**P-Value**
	D-dimers day 0	2627.50 (1280.75 - 3582.50)	1.334	0.182
	D-dimers day 5	1508.50 (754.25 - 6312.50)		
	D-dimers day 0	2627.50 (1280.75 - 3582.50)	2.366	**0.018****
	D-dimers day 10	1630 (490 - 4797)		
	D-dimers day 5	1508.50 (754.25 - 6312.50)	1.363	0.173
	D-dimers day 10	1630 (490 - 4797)		
CRP	**Days**	**Median (IQR)**	**Wilcoxon Signed Rank**	**P-Value**
	CRP day 0	216.40 (150 - 251)	4.372	**0.000****
	CRP day 5	27.20 (14.08 - 45.28)		
	CRP day 0	216.40 (150 - 251)	2.792	**0.005****
	CRP day 10	15.70 (4.90 - 84.30)		
	CRP day 5	27.20 (14.08 - 45.28)	0.931	0.352
	CRP day 10	15.70 (4.90 - 84.30)		
LDH	**Days**	**Median (IQR)**	**Wilcoxon Signed Rank**	**P-Value**

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	LDH day 0	467 (396 - 600.50)	2.482	**0.013****
	LDH day 5	397.50 (314.50 - 541.25)		
	LDH day 0	467 (396 - 600.50)	1.820	0.069
	LDH day 10	389.50 (353.50 - 519.25)		
	LDH day 5	397.50 (314.50 - 541.25)	1.274	0.203
	LDH day 10	389.50 (353.50 - 519.25)		

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Ref 2021-1806-10

Title: Early liver transplantation in ACLF patients in the ICU improves 1-year survival

Authors: Waelkens B., Wilmer A., Hermans G., Wauters J., Meersseman P.

Institution: Emergency Department, AZ Sint Maarten, Mechelen, Belgium (2) Medical Intensive Care Unit, Department of General Internal Medicine,University Hospitals, Leuven, Belgium

Abstract:

INTRODUCTION and OBJECTIVES

Acute-on-chronic liver failure (ACLF) is a syndrome characterized by acute decompensation of cirrhosis, organ failures and high short-term mortality. Liver transplantation is the only curative treatment in ACLF patients not responding to medical therapy. However, transplantation in this very sick population remains controversial in an era of organ shortage as post-transplant survival is believed to be low. We investigate the impact of early liver transplantation on 1-year survival in ACLF patients admitted to the intensive care unit (ICU) compared to non-transplanted critically ill ACLF patients.

METHODS

We performed a single center retrospective study of ACLF patients admitted to the Medical ICU of a tertiary university hospital between 5/2007 and 1/2019. All patients with ACLF grade 1-3 according to EASL-CLIF consortium criteria were included and divided in a group transplanted within 90 days after ICU admission and a group not receiving a new donor liver. Patients transplanted between 90 days and 1-year post-ICU admission were excluded. Baseline characteristics were collected and prognostic scores and mortality calculated for both groups and for each ACLF grade separately (table 1).

RESULTS

Of 533 ACLF (grade 1-3) patients, 88 patients were transplanted of which 54 within 90 days after ICU admission. Median interval between ICU admission and transplantation was 19,5 (IQR 8,25-47,25) days. 14/54 (25,9%) were transplanted during ICU admission with a median ICU admission-transplantation interval of 6,5 (IQR 4-8) days. There were no major differences in CLIF-OF, CLIF-C ACLF, CHILD, MELD, APACHE II and SOFA score at admission between the two groups or within ACLF grades. 1-year mortality in the group without transplantation was 67,6% versus 20,4% in the transplant group ($p<0,00001$). Impact of transplantation on 1-year mortality was highest in grade 3 (16,7% versus 79,8%, $p<0,00001$). In grade 2, 1-year mortality with and without transplantation was 13,3% versus 56,5% ($p<0,005$) respectively and in grade 1 44,4% versus 59,1% ($p= 0,4$).

CONCLUSIONS

Early liver transplantation for ACLF improves 1-year survival, compared to non-transplanted ACLF patients. Reduction in mortality was even highest in the most severely ill grade 3 group. ACLF patients admitted to the ICU should be evaluated for transplantation early in their disease course.

+ Table

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Table 1

	ACLF without transplantation (n445)	ACLF with transplantation < 90 after admission ICU (n54)	P-value
AGE median (Q1-Q3)	61 (54-68)	58,5 (53-62)	
SEX male (%)	306 (68,8)	31 (57,4)	
HOS LOS days n (Q1-Q3)	23 (13-39)	58,5 (36-82,5)	
ICU LOS days n (Q1-Q3)	5 (3-12)	6 (3-8)	
1y MORTALITY n(%)			
All	301/445 (67,6)	11/54 (20,4)	<0,00001
Grade 1	52/88 (59,1)	4/9 (44,4)	0,396873
Grade 2	87/154 (56,5)	2/15 (13,3)	0,001394
Grade 3	162/203 (79,8)	5/30 (16,7)	<0,00001
SCORES			
CLIF OF median (Q1-Q3)	12 (11-13)	12 (11-14)	
CLIF C ACLF median (Q1-Q3)	58 (53-64)	55 (50-61)	
CHILD median (Q1-Q3)	10 (9-12)	11 (8,25-12)	
MELD median (Q1-Q3)	24 (18-31)	27,5 (22-33)	
APACHE II median (Q1-Q3)	24 (19-30)	22 (19-27)	
SOFA median (Q1-Q3)	11 (8-13,5)	11 (9-12,25)	
Laboratory parameters median (Q1-Q3)			
Bilirubin (mg/dl) median (Q1-Q3)	3,64 (1,51-9,09)	10,8 (4,11-21,83)	
Creatinin (mg/dl) median (Q1-Q3)	1,61 (0,85-2,66)	2,11 (0,99-2,64)	
INR median (Q1-Q3)	1,8 (1,5-2,4)	1,9 (1,6-2,5)	

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2021 –ANNUAL MEETING of the Belgian Society of Intensive Care Medicine (June 18, 2021) ACCEPTED ABSTRACTS

Ref 2021-1806-11

Title : Anti-factor Xa monitoring in severe Covid-19 patients

Authors : Bongaerts T., Kennes J., De Mey N., De Neve N., De Decker K.

Institution : OLV Ziekenhuis, campus Aalst

Introduction
Severe Covid-19 disease has been associated with coagulopathy, leading to thromboembolic (TE) complications. High incidences of both venous (VTE) and arterial thromboembolism (ATE) have been described, despite pharmacological thromboprophylaxis. Anti-factor Xa (aXa) monitoring is an in vitro assessment of the efficacy of low-molecular-weight-heparins and has shown potential in trauma and burn patients, in obesity and in renal failure. A laboratory test evaluating the efficacy of a given dose of enoxaparin and guiding dose adjustments, might help to prevent TE complications and side effects such as hemorrhage.

Objectives
To evaluate the utility of routine aXa monitoring in severe covid-19 patients initiated on weight-based enoxaparin treatment.

Methods
In this single-center retrospective cohort study, all PCR-positive patients admitted to the ICU until the 12th of January 2021 were screened for eligibility. Routinely, patients are started on intermediate intensity enoxaparin (0.5 mg/kg bd). In case of suspected or confirmed VTE or in case of a non-covid related indication, therapeutic intensity enoxaparin (1 mg/kg bd) is started. In case of renal failure, doses are reduced by half. AXa peak levels are taken 3 to 4 hours after an enoxaparin dose. Patients were included if they were admitted for respiratory failure and if aXa peak levels were taken after at least three doses . The initial aXa peak level was examined, with inclusion of both intermediate and therapeutic regimens. The target aXa peak levels were resp. 0.2 to 0.5 U/mL and 0.6 to 1.0 U/mL. The primary outcome was the incidence of out-of-range aXa peak levels. Secondary outcomes included the incidence of VTE, ATE and hemorrhage and potential risk factors for an inadequate aXa peak level.

Results
A total of 93 patients met the inclusion criteria. AXa peak levels were out-of-range in 32/93 (34.4%) of patients: 21/93 (22.6%) were sub- and 11/93 (11.8%) were supratherapeutic. The total incidence of TE was 14/93 (15.1%) with VTE occurring in 6/93 (6.5%) and ATE in 8/93 (8.6%) of patients. The incidence of hemorrhage was 22/93 (23.7%). As shown in table 1, no statistically significant risk factor was found.

Conclusions
The use of aXa monitoring can be helpful to ensure appropriate dosing in severe covid-19 patients initiated on enoxaparin treatment. Further trials should evaluate whether aXa monitoring is superior to weight-based dosing in terms of clinical outcome. Furthermore, debate remains regarding the ideal target level.

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Ref 2021-1806-12

Title : Transpulmonary pressures with an air-filled esophageal catheter

Authors : Berg J(1), Massion PB(1), Samalea N(2), Parzibut G(1), Lambermont B(1), Ledoux D(1), Massion PP(3)

Institution : 1Department of Intensive Care, University Hospital of Liege, Belgium 2Department of Anesthesiology, University Hospital of Liege, Belgium 3Division of Allergy, Pulmonary and Critical Care Medicine, Vanderbilt University Medical Center, Nashville, TN, 37232, USA

INTRODUCTION:
Transpulmonary pressures measurements could be useful to better characterize respiratory mechanics and to guide lung protective ventilation in ARDS1. An easy, bedside, disposable and reliable tool for esophageal pressure measurements is lacking.
OBJECTIVE: to explore the feasibility of our new transpulmonary pressure measurement method by an air-filled esophageal catheter[2] and its clinical benefit for detecting ventilator induced lung injury and for individualizing protective ventilation.

METHODS:
We tested our a novel method with an air-filled esophageal catheter without balloon, positioned in the lower third of the esophagus and connected to an air-filled pressurized blood pressure transducer bounded to the monitor. We collected data from 21 ventilated patients (11 covid-19 ARDS, 4 neurological injuries, 2 cardiopathies, 3 pulmonary sepsis, 1 thoracic trauma), measured end-inspiratory and end-expiratory pressures of both airway and esophageal pressures. We calculated transpulmonary pressures via our new available online calculator (www.esophageal-pressure-calculator.be).

RESULTS:
We obtained esophageal and transpulmonary pressure measurements with our new method in all our 21 patients (male n=17). Signals were stable and reliable as reported[2]. According to airway pressures, 19/21 patients were under protective ventilation in volume-controlled mode (see table 1a). Esophageal pressure measurements allowed i) determination of chest wall/lung elastances, elastance ratio and esophageal delta pressure; ii) detection of risk for barotrauma (PLei,ER > 20cmH2O), for atelectrauma (PLee < 0 cmH2O) and for lung stress with the transpulmonary driving pressure (delta PL > 12 cmH2O) (see Table 1b). According to the transpulmonary approach, 16/21 patients presented either barotrauma (n=5) and/or atelectrauma (n=12) and/or lung stress (n=4). Respiratory settings were adapted in all 16 patients accordingly (modification of Peep n=11 or of Vt n=6). Of note, Covid-19 patients compared with non-covid patients had a higher plateau pressure, a higher PEEP, a higher ventilatory ratio[3] and a higher risk of barotrauma.

CONCLUSION:
Transpulmonary pressures can easily be obtained at the bedside by our air-filled esophageal catheter's method and allow individualized protective ventilation in ICU patients.
References: 1Yoshida T et al. (2019) ICM 535-538. [2]Massion PB et al. (2021) ICM experimental, submitted. [3]Sinha P et al (2019) AJRCCM 333-341.

+ Table

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TABLE

	Total (n=21)	Covid 19 (n=11)	Non-covid (n=10)
1a. Airway-derived parameters:			
Tidal volume (ml/kg PBW)	6.3 ± 1.4	6.5 ± 1.1	6.6 ± 0.5
PEEP (cmH_2O)	10 ± 4	12 ± 2.8*	8 ± 3.6
Plateau pressure (cmH_2O)	20 ± 6	23.6 ± 4.7**	16.8 ± 4
Driving pressure (cmH_2O)	10 ± 4	12 ± 4	9 ± 2
Elastance of respiratory system (Ers, cmH_2O/L)	24.4 ± 11.9	29.1 ± 14.3	19.4 ± 5.4
Ventilatory ratio	2.5 ± 1.3	2.9 ± 1.1*	2.1 ± 1.4
1.B Esophageal-derived parameters:			
Esophageal plateau pressure (cmH_2O)	15 ± 4	15 ± 1	15 ± 2
Eso. End-expiratory pressure (cmH_2O)	12 ±4	12 ± 1	12 ± 2
Esophageal Delta Pressure (cmH_2O)	3 ± 2	3 ± 2	4 ± 2
Chest wall elastance (cmH_2O/L)	7.3 ± 3.6	6.8 ± 3.5	8.3 ± 3.4
Lung elastance (El, cmH_2O/L)	17.1 ± 13.1	22.3 ± 15.9	11.1 ± 5.7
Elastance ratio (ER = El/Ers)	0.64 ± 0.22	0.70 ± 0.07	0.55 ± 0.05
Barotrauma: $P_L$ei,ER (cmH2O)	13 ± 7	17 ± 2**	9 ± 1
Atelectrauma: $P_L$ee (cmH2O)	-1.5 ± 4.4	0 ± 1	-3 ± 2
Lung stress: delta P_L (cmH2O)	7 ± 5	9 ± 5	5 ± 3

*p<0.05; **p<0.01; P_L, transpulmonary pressure; ei, end-inspiratory; ee, end-expiratory.

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2021 –ANNUAL MEETING of the Belgian Society of Intensive Care Medicine (June 18, 2021) ACCEPTED ABSTRACTS

Ref 2021-1806-13

Title : Antimicrobial use in COVID-19 patients treated with corticosteroids

Authors : Kennes J. MD; Bongaerts T. MD; De Neve N. MD; De Mey N. MD; De Decker K. MD.

Institution : Department of anesthesiology and intensive care, OLV Hospital Aalst

Introduction

The management of COVID-19 patients changed over time as a result of the continuous search for better therapies. As in many centers, hydroxychloroquine and empiric antibiotic agents (amoxicillin-clavulanic acid and clarithromycin) were used at the OLV hospital Aalst (Belgium) during the first wave (March to June 2020). The use of hydroxychloroquine has not been recommended anymore for COVID-19 in Belgium since June 2020. During the second wave (September 2020 to January 2021) the treatment consisted of dexamethasone without antibiotic prophylaxis. The RECOVERY trial observed a lower 28-day mortality rate with the use of corticosteroids in patients receiving oxygen or invasive mechanical ventilation [1]. Corticosteroid treatment has possible adverse effects. The information on secondary infections related to corticosteroid treatment is scarce. Some authors observed more secondary infections and increased use of broad-spectrum antibiotics in the corticosteroid group [2]. In this retrospective observational study, the antimicrobial use before and after introduction of systematic corticosteroids was analyzed.

Objectives

Is there a difference in antimicrobial therapy in COVID-19 patients before and after systemic administration of corticosteroid therapy for critically ill COVID-19 patients?

Methods

We performed a retrospective analysis of all patients with COVID-19 admitted to the intensive care unit of the OLV hospital Aalst from 15/03/2020 until 19/01/2021 and searched for antimicrobial therapy and isolated microorganisms.

Results

Demographic data of the analyzed patients are presented in table 1. We could not observe a difference in overall antibiotic use between both cohorts, apart from protocol or participation to clinical trials (table 1). There are slight differences regarding individual antibiotics with an increased use of flucloxacillin and voriconazole during the second wave (table 1). Methicillin sensitive staphylococcus aureus (MSSA) was isolated in 14.29% of patients in the first wave compared to 28.72% of patients in the second wave ($p = .078$). Three cases of Aspergillus were observed in the second wave compared to none in the first wave.

Conclusion

We observed no difference in overall antibiotic use after the introduction of systemic corticosteroids. There is a trend toward more flucloxacillin and voriconazole use in the corticosteroid cohort. Further studies are needed to address this topic.

References

[1] RECOVERY Collaborative Group, Horby P, Lim WS, Emberson JR, Mafham M, Bell JL, Linsell L et al. 2021. Dexamethasone in Hospitalized Patients with Covid-19. N Engl J Med. 384(8):693-704. doi: 10.1056/NEJMoa2021436.

[2] Van Paassen J, Vos JS, Hoekstra EM, Neumann KMI, Boot PC, Arbous SM. 2020. Corticosteroid use in COVID-19 patients: a systematic review and meta-analysis on clinical outcomes. Crit Care. 24(1):696. doi: 10.1186/s13054-020-03400-9.

2021 –ANNUAL MEETING of the Belgian Society of Intensive Care Medicine (June 18, 2021) ACCEPTED ABSTRACTS

Ref 2021-1806-14

Title : sCAP and HCAP: a retrospective study on impact from immunosupression

Authors : Persyn J, Prof. Depuydt P, Van De Ginste L

Institution : Sint Jozef Kliniek Izegem

INTRODUCTION:
The ATS-IDSA criteria defines severe community-acquired pneumonia (CAP) or CAP IV as the need for mechanical ventilation and/or vasopression. (Major criteria: MC) or, in the abscence of MC, 3 or more minor criteria. The concept of healthcare-associated pneumonia (HCAP) has been defined as a pneumonia which results from close contact to the healthcare system. HCAP is believed to be closer to H(hospital)AP concerning etiology, prognosis, microbiology and underlying co-morbidities. The presence of immunosuppression, however, has not been used as a distinctive feature between CAP and HCAP. One would suspect immunosuppression to have impact on severity, microbiology and prognosis. Severe HCAP has not been specified in literature, but for the purpose of this study we used the aformentioned criteria

OBJECTIVES:
A retrospective analysis of all records on sCAP and HCAP at UZ Ghent from 2013 to 2017 has been performed to demonstrate whether a connection could be drown between the diagnosis of sCAP and HCAP and immunosuppression. Furthermore, we investigated if the presence of immunosuppresion had an influence on prognosis and survival.

METHODS:
Since 2013 every patient admitted at the ICU of UZ Ghent, who was prescribed an antibiotic, was linked to it's indication using COSARA. This coupling includes the clinical probability of every infection. An ICU patient who received an antibiotic treatment from 1/1/2013 to 30/9/2018 with the indication CAP or HCAP with high probability was included. A manual review of every file was performed . 409 patients were included for analysis on demographics, SAPSII score, APACHE II score, immunosupression , ATS-IDSA criteria, HCAP criteria and ICU mortality. PJP, IPA and neutropene sepsis were excluded from this study.

RESULTS:
No significant differences were observed between CAP (202 patients) and HCAP (207 patients) regarding demographics (age and sex), SAPS II score , APACHE II score and mortality. (CAP 19% vs HCAP 18%) However, we found a distinct difference between the number of immunocompromised patients in both groups. Of all patients 30.8% (126/409) had some level of immunosuppression, of which 105 belonged to the HCAP group (50,7%) and only 21 individuals were allocated to the CAP group (10.4%). ($p<0.001$)
Within the IC group, the use of corticosteroids (>=8mg MPredn or equivalent) was the major contributor (70/126), followed by the intake of immunosuppressive agents (44/126) hematological disease (43/126), post-transplant (36/126) and HIV (13/126). Mortality within this group (22/126) was not higher ($p=0.67$) compared to patients without any form of IC (56/283). Furthermore, the survival of IC patients wasn't significant different between the CAP and HCAP group ($p=0.46$).

CONCLUSION:
Our study demonstrates a significant difference between CAP en HCAP regarding immunosuppresive status within these groups. However, this did not lead to a higher morbidity (SAPSII, APACHE) nor mortality

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Ref 2021-1806-15

Title : Validation of the COVID-19 Decission Support Tool a retrospective analysis

Authors : Grietens J. (MD), Willaert X. (MD), Mesotten D. (MD, PhD) Fivez T. (MD, PhD)

Institution : ZOL Genk

Introduction

In early spring, Belgium was struck hard by the COVID-19 pandemic, reporting one of the highest mortality rates in the world (1). Our hospital, Ziekenhuis Oost-Limburg (ZOL), is situated in the province of Limburg, which was the epicenter of the COVID crisis in Belgium, reporting the highest infection rate of all Belgian provinces (2). National guidelines concerning admission criteria on ICU of patients with a COVID-19 pneumoniae were lacking.
This is a single center retrospective analysis of patients that would have been excluded from ICU according to the NHS COVID-19 decision support tool. All patients admitted to the ICU with a confirmed COVID-19 pneumonitis from March to June 2020 were included in the analysis.

Methods

Categorical data were represented as numbers and percentages. The distribution of continuous data was analyzed and represented as either mean +/- SD or median and IQR. No data imputation was done as for all variables the missings were less than 15%. All P-values were 2-sided and considered significant when < 0.05. All analyses were performed with JMPsoftware version 15.0.0 (SAS Institute, Cary, NC, USA).

Outcome

97 patients were admitted to the ICU. Mean APACHE III was 67 (n 16), with a predicted ICU mortality of 30%. The ICU mortality rate was 20.6% (n=20). 44% (n 44) of patients would not be admitted to the ICU according to the NHS guidelines. The mortality in this group was significantly higher 38% (17).

Discussion

Although mortality is significantly higher; 28% of our population (27) wouldn't be admitted to the ICU according to the NHS COVID-19 decision support tool; although they did survive. Follow-up of these patients is planned.

References

1. How well have OECD countries responded to the coronavirus crisis? The Economist Intelligence Unit, @TheEIU, June 17, 2020
2. Epidemiological situation of the coronavirus in Belgium: daily report of national and international situation. Sciensano. Accessed June 21, 2020. https://covid-19.sciensano.be/nl/covid-19-epidemiologische-situatie
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Ref 2021-1806-16

Title : DVT in COVID-19 ICU Patients: POCUS screening

Authors : Priem H., Lormans P.

Institution : AZ Delta

Introduction

The association between COVID-19 and thrombo-embolic events has been extensively reported, with significant alterations of coagulation parameters indicating a higher mortality. This seemingly disease specific hypercoagulable state was coined COVID-19 associated coagulopathy (CAC) and can manifest, even in conjunction with adequate thrombo-prophylaxis, as a DVT (1). Our hospital, following experts advise, swiftly switched from a prophylactic to an intermediate dose anticoagulation protocol with enoxaparine (1 mg/kg divided in two doses) for ICU patients.
The highly infectious nature of the SARS-COV-2 virus via respiratory droplets caused concern for nosocomial spread of the virus and thus favored the application of point-of-care ultrasound (POCUS) for guidance and decision making.

Objectives

We aimed to explore the prevalence of ultrasound-proven DVTs in COVID-19 patients admitted to our ICU.

Methods

In this prospective observational study, we started including all severe COVID-19 patients that were admitted to our intensive care unit from the end of April to June 2020. Patients admitted, for any reason, to the ICU with an incidental positive COVID PCR were excluded. When feasible, patients were screened twice a week during their entire stay on the unit. The screening consisted of an extended compression ultrasound (ECUS) of the lower extremities together with a compression ultrasound of the subclavian and internal jugular veins. Additionally, we collected SOFA-scores, biochemical data, information about respiratory support and thrombotic or bleeding events were noted.

Results

We included 18 patients, in who we performed a total of 55 screenings. The study-population, of which 61% were male patients, had a mean age of 65 (range 41 - 86) a BMI of 27.5 kg/m2 (SD 4.99). Five patients already received therapeutic anticoagulation owing to different comorbidity. Half of the patients were intubated when screenings took place and three patients received ECMO support. The mean SOFA score was 6.54 (SD 3.72) and the mortality rate was 55%.
No DVTs in the lower extremities were detected, however two patients had a right, probably catheter-related, jugular vein thrombosis. One of them had a history of a pulmonary embolism. Twelve patients had at least one central venous access in place when screenings took place. Bleeding events were reported in 4 patients, with one being a hemorrhage due to a spleen infarction after a vena lienalis thrombosis.

Conclusions

The prevalence of DVTs in our, albeit small, study was relatively low compared with earlier reports, respectively 11%. We must await upcoming RCTs, investigating the ideal dose of thromboprophylaxis. POCUS is an easy tool for DVT screening and is becoming invaluable in our modern ICUs.

References

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SIZ BELGIAN SOCIETY OF INTENSIVE CARE MEDICINE

2021 –ANNUAL MEETING of the Belgian Society of Intensive Care Medicine (June 18, 2021)
ACCEPTED ABSTRACTS

Ref 2021-1806-17

Title : Can pain pupillary index prognosticate outcome in cardiac arrest patients?

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Introduction
The Neurological Pupil Index (NPi), derived from automated pupillometry, showed high specificity to predict poor neurological outcome after post-anoxic brain injury [1]. Whether other indices derived from pupillometry have also a prognostic value in this setting remains unknown.

Objectives
To assess the predictive value of the Pupillary Pain Index (PPI) for unfavorable neurological outcome (UO) after post-anoxic brain injury.

Methods
Ongoing prospective study including comatose patients admitted to the Intensive Care Unit after cardiac arrest since October 2019. Two different automated pupillometers were concomitantly used and NPi (from NeurOptics NPi-200, Neuroptics) and PPI (from NeuroLight, ID-MED) were assessed at day 1 and day 2 after admission. In particular, PPI was calculated using an electrical stimulation with variable intensity (increasing from 10 mA to 60 mA) on the left and right forearm of each patient: pupil dilation >13% in response to such stimulation with
increasing intensity and duration was converted in the PPI score, ranging from 1 (pupillary dilation < 5% to the maximal stimulation intensity) to 10 (pupillary dilation > 13% with 10 mA stimulus). Mean values from both eyes were used. The coefficient of agreement between PPI and NPi was computed. UO was defined as Cerebral Performance Category of 3-5 at 3 months.

Results
A total of 61 patients were included; 40 (65%) patients had UO. Patients with UO showed a lower PPI (3 [1-5] vs. 5 [3-6]; p=0.04 on day 1 and 3 [1-5] vs 5 [4-7]; p=0.01 on day 2) than others; PPI had an area under the receiver operator characteristic (AUROC) of 0.69 [95% CI 0.55-0.83] on day 1 and 0.72 [0.59-0.85] on day 2 to predict UO. In particular, PPI=1 on day 2 showed a sensitivity of 26% [14%-41%] and a specificity of 100% [81%-100%] to predict UO, with a false positive rate (FPR) of 0%. A weak correlation (r=0.41, p<0.01) on day 1 and a moderate correlation (r=0.51, p<0.01) on day 2 was observed between PPI and NPi. A total of 5 patients had concomitant PPI=1 and NPi≤2 (all had UO), while 6 showed NPi>2 and PPI=1 (all had UO). Among the remaining 50 patients, 1 had NPi≤2 with PPI>1 and 49 had PPI>1 with NPi>2. As such, the coefficient of agreement of PPI=1 and NPi≤2 to predict UO was 0.53. When at least one predictor (i.e. PPI=1 or NPI≤2) was present on day 2, a sensitivity of 28% [15%-44%], a specificity of 100% [81%-100%], with 0% FPR was observed.

Conclusions
Pupillary pain index showed promising results in prognosticate UO after post-anoxic brain injury.

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2021 –ANNUAL MEETING of the Belgian Society of Intensive Care Medicine (June 18, 2021) ACCEPTED ABSTRACTS

Ref 2021-1806-18

Title : Diagnostic criteria for delayed cerebral ischemia and outcome after non-traumat

Authors : Gouvea Bogossian E, Diaferia D, Ndieugnou N, Menozzi M, Peluso L, Annoni F, Creteur J, Taccone FS

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Introduction:
Delayed cerebral ischemia occurs in 20%-30% of patients with aneurysmal subarachnoid hemorrhage (aSAH) and is the most important preventable cause of poor neurological outcome. The advances in imaging techniques and in multimodal monitoring can help diagnose potentially reversible DCI and improve outcome of aSAH.

Methods:
This is a retrospective cohort study of patients admitted to the Intensive Care Unit (ICU) of Erasme Hospital (Brussels, Belgium) with aSAH from 2010-2020.We excluded patients who remained than 24 hours in the ICU. We reported the prevalence and factors associated with the development of DCI using the following definitions: type 1: permanent neurological deficit and/or cerebral infarction on CT scan not explained by other causes and not related to procedures; type 2: new neurological deficit and cerebral vasospasm (diagnosed on transcranial doppler, angio-CT scan, angio-MRI and/or angiography); type 3: new neurological deficit or poor clinical exam associated with radiological evidence of vasospasm and neuromonitoring (brain oxygen pressure below 20 mmHg or lateralization on EEG)/perfusion CT-scan compatible with ischemia. Early brain injury was defined as a Glasgow Coma Scale < 13 on admission. Unfavorable neurological outcome at 3 months was defined as Glasgow Outcome Scale (GOS) of 1-3.

Results:
Of 528 eligible patients, 208 (39%) were diagnosed with DCI: 146 (70%) with type 1 criteria, including 94 (44%) patients with initial type 2/3 DCI, and 62 (30%) only with type 2/3 criteria. Early brain injury was independently associated with the development of DCI. The DCI type 1, but not type 2 or 3, was associated with increased in-hospital mortality (HR 1.59 [95% CIs 1.02-2.48] and UO (OR 9.60 [95% CIs 5.31-17.37].

Conclusions:
DCI remains an important determinant of poor outcome after SAH. Patients diagnosed with DCI using imaging tests and multimodal monitoring have better prognosis that those with established neurological deficit or infarction on the CT scan.

SIZ BELGIAN SOCIETY OF INTENSIVE CARE MEDICINE

2021 –ANNUAL MEETING of the Belgian Society of Intensive Care Medicine (June 18, 2021) ACCEPTED ABSTRACTS

Ref 2021-1806-19

Title : Automated pupillometry and prediction of electroencephalography reactivity

Authors Peluso L, Ferlini L, Talamonti M, Ndieugnou Djangang N, Gouvea Bogossian E, Menozzi M, Annoni F, Severgnini P, Creteur J, Oddo M, Vincent JL, GaspardN, Taccone FS

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Introduction
Electroencephalography (EEG) is widely used to monitor critically ill patients. However, EEG interpretation requires the presence of an experienced neurophysiologist and is time-consuming.

Objectives
The aim of this study was to evaluate whether parameters derived from an automated pupillometer (AP) might help to assess the degree of cerebral dysfunction evaluated with electroencephalography (EEG) in critically ill patients.

Methods
In this prospective study, we performed a pupillary assessments using the AP in three subgroups of patients, concomitantly monitored with continuous EEG: i) "post-anoxic brain injury"; ii) "primary brain injury"; iii) "others" (i.e. sepsis, liver failure, etc.). A neurologist scored the degree of encephalopathy and reactivity on EEG using a standardized scale. The mean value of Neurologic Pupil Index (NPi), pupillary size, constriction rate, constriction and dilation velocity (CV and DV) and latency for both eyes, obtained using the NPi®-200 (Neuroptics, Laguna Hills, CA, USA), were reported.

Results
We included 214 patients in the analysis, EEG tracings were categorized as: mild (n=111, 52%), moderate (n=65, 30%) or severe (n=16, 8%) encephalopathy; burst-suppression (n=19, 9%) or suppression background (n=3, 1%); a total of 38 (18%) EEG were classified as "unreactive". We found a significant difference in all pupillometry variables among different EEG categories. Moreover, an unreactive EEG was associated with lower NPi, pupil size, pupillary reactivity, CV and DV and a higher latency than reactive recordings. Low DV (Odds ratio 0.01 [95% confidence intervals 0.001-0.15]; $p<0.01$) was independently associated with an unreactive EEG, together with the use of analgesic/sedative drugs and high lactate concentrations. In particular, DV values had an area under the curve (AUC) of 0.85 [0.78 – 0.91; $p<0.05$] to predict the presence of unreactive EEG. In subgroups analyses, AUC of DV to predict unreactive EEG was lower (0.70 [0.55-0.86]) in post-anoxic brain injury than primary brain injury (0.91 [0.82-1.00; $p < 0.01$]) and other diseases (0.95 [0.88-1.00; $p<0.01$]).

Conclusions
DV measured by the AP might effectively identify an unreactive EEG background, particularly in patients without anoxic brain injury.

2021 –ANNUAL MEETING of the Belgian Society of Intensive Care Medicine (June 18, 2021) ACCEPTED ABSTRACTS

Ref 2021-1806-20

Title : Factors associated with brain tissue oxygenation changes after transfusion

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Background:
Anemia is common after acute brain injury and can be associated with brain tissue hypoxia. Red blood cell transfusion (RBCT) can improve brain oxygenation; however, predictors of such improvement remain unknown.

Methods:
This multicentric retrospective cohort study (2012-2020) included all patients admitted to 3 European Intensive Care Units with acute brain injury who were monitored with brain tissue oxygenation (PbtO2) catheters and received at least one RBCT. We aimed to identify the factors associated with PbtO2 increase (>20% from baseline value) after RBCT, using a generalized mixed model (GMM).

Results:
We included 69 patients receiving a total of 109 RBCTs after a median of 9 [5-13 days] days after injury. Baseline hemoglobin (Hb) and PbtO2 were 7.9 [7.3-8.7] g/dL and 25 [20-30] mmHg, respectively; 2 hours after RBCT, the median absolute Hb and PbtO2 increases from baseline were 1.2 [0.8-1.8] g/dL (p =0.001) and 3 [0-6] mmHg (p=0.001). A 20% increase in PbtO2 after RBCT was observed in 45 (41%) transfusions. Subarachnoid hemorrhage (SAH) as underlying disease, high heart rate (HR) and low PbtO2 at baseline were independently associated with a 20% increase in PbtO2 after RBCT. Baseline PbtO2 had an area under receiver operator characteristic of 0.73 (95% CI 0.64-0.83) to predict PbtO2 increase; a PbtO2 of 20 mmHg had a sensitivity of 58% and a specificity of 73% to predict PbtO2 increase after RBCT.

Conclusions:
Lower PbtO2 values, high HR and SAH at baseline could predict a significant increase in brain oxygenation after RBCT.