

Meeting report

15th Annual Congress of the European Society of Intensive Care Medicine, 29 September–2 October 2002, Barcelona, Spain: Clinical research to improve outcome

Marc-Jacques Dubois¹, Colin L Verdant² and Redouane Bouali³

¹Intensivist, Critical Care Medicine Division, University of Montreal Hospital, Montreal, Quebec, Canada

²Fellow in Critical Care Medicine, Faculty of Medicine, University of Montreal, Montreal, Quebec, Canada

³Intensivist, Critical Care Medicine Division, University of Montreal Hospital, Montreal, Quebec, Canada

Correspondence: Marc-Jacques Dubois, marc-jacques.dubois@umontreal.ca

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Abstract

The 15th Annual European Society of Intensive Care Medicine Meeting opened in Barcelona, Spain on September 30, 2002. This report focuses on some highlights of this congress. Preliminary data from the Sepsis Occurrence in the Acutely ill Patient (SOAP) study are presented, as are findings from the Assessment of Low Tidal Volume and Elevated End-Expiratory Volume to Obviate Lung Injury (ALVEOLI) study, which compared higher positive end-expiratory pressure (PEEP)/lower fractional inspired oxygen (FiO₂) with lower PEEP/higher FiO₂ strategies. We also present a study that compared continuous with intermittent renal replacement therapies. Finally, the seven posters that received an award are summarized.

Keywords acute renal failure, acute respiratory distress syndrome, European Society of Intensive Care Medicine, positive end-expiratory pressure, septic shock

The 15th Annual European Society of Intensive Care Medicine (ESICM) meeting opened in Barcelona, Spain on 30 September 2002, with 'Clinical research to improve outcome' as a motto. Participants could attend thematic and educational sessions that covered a wide range of topics. Roundtable meetings and pro/con debates between experts in various areas were also held. Space was given to abstract presentations (oral presentations, poster symposia and sessions); there were more than 500 abstracts presented, generating interesting debates among the participants. Another unique aspect of the congress was that entire sections were devoted to nurses and physiotherapists, making them active contributors to the advancement of intensive care research.

Such a broad range of topics and activities renders extensive coverage of the congress difficult. We therefore opted to focus on highlights, acknowledging that all of the presented

works were important to the development of critical care medicine.

Interesting work was presented in the session entitled 'Results from the most recent clinical trials in intensive care medicine'.

The SOAP study: preliminary results

Jean-Louis Vincent from the Free University of Brussels, Belgium presented preliminary data from the Sepsis Occurrence in the Acutely ill Patient (SOAP) study, which was conducted over the period 1–15 May 2002. The goal of the study was to determine the incidence of severe sepsis and septic shock in intensive care unit (ICU) patients in European centres. Over the 2 weeks, 3147 patients from 198 centres were studied. Epidemiological data and other clinical data related to severity of disease, organ dysfunction, survival status and treatment aspects were recorded. Patient

ALI = acute lung injury; ARF = acute renal failure; ICU = intensive care unit; FiO₂ = fractional inspired oxygen; PEEP = positive end-expiratory pressure; SOFA = Sepsis-related Organ Failure Assessment.

characteristics and some results are summarized in Table 1 [1–3]. The incidence of infection varied according to geographical location, and was highest in Portugal and lowest in Switzerland. The lung was the most commonly reported source of infection. Gram-positive and Gram-negative pathogens were equally present in the infected patients. Among Gram-negative cases, *Pseudomonas* spp. and *Escherichia coli* were the most frequently encountered pathogens.

Haemodynamic support in patients with sepsis was most often accomplished with norepinephrine (noradrenaline). For fluid resuscitation, hydroxyethyl starches and gelatins were used in almost equal proportions (34.2% versus 30.6%).

That study is of paramount importance because it provides important insights into the incidence of septic states. Moreover, it is clear that the data regarding epidemiological features, severity of disease, organ dysfunction and treatment aspects will generate important conclusions.

High versus low positive end-expiratory pressure: the ALVEOLI study

Dr Arthur Slutsky from Toronto, Canada presented findings from the Assessment of Low Tidal Volume and Elevated End-Expiratory Volume to Obviate Lung Injury (ALVEOLI) study, which compared the use of higher positive end-expiratory pressure (PEEP)/lower fractional inspired oxygen (FiO₂) versus lower PEEP/higher FiO₂ in patients with acute lung injury (ALI) and acute respiratory distress syndrome. That prospective, randomized, multicentre study was based on the presumption that mortality from ALI and acute respiratory distress syndrome could be reduced using a strategy designed to prevent lung injury from repeated collapse of alveoli at end-expiration. The hypothesis was that both strategies would result in the same mortality rate.

Inclusion criteria were the classical criteria used to define ALI [4]. Among the exclusion criteria, the most important were physician refusal to use assisted/controlled ventilation mode for 12 hours, a delay to treatment of more than 36 hours from satisfaction of the inclusion criteria, and various medical conditions that precluded inclusion.

The primary outcome was mortality before hospital discharge or on day 60 after randomization, with the latter group being classified as survivors if they were still alive on day 60. Some secondary outcomes were ventilator free days and ICU free days.

Patients were ventilated with a tidal volume of 6 cm³/kg predicted body weight, aiming for a plateau pressure of less than 30 cmH₂O. Target ranges for oxygenation were an arterial oxygen tension between 55 and 80 mmHg, or an oxygen saturation between 88% and 95%. The first 150 patients received a recruitment manoeuvre, but this practice

Table 1

Sepsis Occurrence in the Acutely ill Patient (SOAP) study: patient characteristics

Characteristic	Value
Age (years); median (interquartile range)	64 (50–74)
Provenance from medical wards	1951 (62)
Mean SAPS II score [1]	34
SOFA score values [2] at inclusion	5
SOFA maximum	6
SOFA mean during study period	4
ICU duration of stay (days)	3
Hospital duration of stay (days)	15
ICU mortality	582 (18.5)
Infection*	1177 (37.4)
Clinical suspicion of infection	966 (30.7)
Positive microbiological cultures	906 (28.8)
Antibiotic therapy	2001 (63.6)
Sepsis [3]	1091 (34.7)
Severe sepsis [3]	928 (29.5)
Septic shock [3]	462 (14.7)
Presence of venous central lines	2272 (72.2)
Presence of pulmonary artery catheter	481 (15.3)
Mechanical ventilation	2023 (64.3)
Haemodialysis	142 (4.5)
Continuous veno-venous haemofiltration	211 (6.7)

Shown is a summary of patient characteristics from the SOAP study (*n*=3147). Values are expressed as number (%), unless otherwise stated. *Defined as clinical suspicion of infection and/or positive microbiological culture plus use of antibiotic therapy. ICU, intensive care unit; SAPS, Simplified Acute Physiology Score; SOFA, Sequential Organ Failure Assessment.

was stopped thereafter. For both groups, oxygenation was maintained in the target range using a table of PEEP/FiO₂ combinations.

The investigators planned to recruit 750 patients, so that there would be an 89% chance of finding a 10% significant decrease in mortality. Intermediate analysis was planned after 250 and 500 patients had been recruited. The study was prematurely stopped after a recommendation from an independent data and safety monitoring board. 'Futility' was stated as the reason for ending the study after enrollment of 550 patients.

Baseline characteristics of the patients at enrollment were dissimilar between the two groups. Patients in the higher PEEP group were older and had a lower ratio of arterial oxygen tension (PaO₂) to fractional inspired oxygen (FiO₂)

than did those in the control group. However, Acute Physiology and Chronic Health Evaluation III scores were similar between the groups. No difference was observed between the groups with respect to mortality (27.6% in the lower PEEP group versus 24.9% in the higher PEEP group; $P=0.44$), even after adjustment for differences in age and ratio of pressure to flow. Dr Slutsky concluded that, on the basis of these findings, the higher PEEP/lower FiO_2 strategy should not routinely be favoured over the lower PEEP/higher FiO_2 strategy, even though there was a trend toward excess mortality in the lower PEEP group.

Acute renal failure: continuous versus intermittent renal replacement therapy

Dr Hans Ulrich Rothen from Bern, Switzerland presented findings from his study on outcomes of patients with acute renal failure (ARF) who require dialysis. Because mortality in this population may reach 50–90%, newer therapies to decrease mortality are urgently needed. Continuous renal replacement therapy has potential advantages over conventional therapy, including improved haemodynamic stability, gradual removal of toxins and inflammatory mediators, and optimal fluid management, along with the ability to administer parenteral nutrition without causing fluid overload. The study was conducted to identify whether these potential benefits might translate into improvement in renal and patient outcomes. The aim of the study was therefore to compare both strategies randomly with mortality in the ICU as the primary outcome. Totals of 70 and 55 comparable patients were enrolled in the continuous and intermittent groups, respectively. No differences were observed with regard to haemodynamic stability in the groups, although colloids were administered more frequently in the intermittent group. The overall mortality and recovery from ARF were the same in both groups. The authors of that study concluded that their data do not support the use of one therapy over the other as a way to improve survival in patients with ARF in the ICU. However, they emphasized the small size of their study, which might account for the inconclusive results.

Levosimendan: a new therapy for decompensated heart failure?

A new molecule was the topic of many presentations. Ferenc Follath from Zurich, Switzerland and Mervyn Singer from London, UK chaired a session entitled 'An evolving role for levosimendan in acute decompensated heart failure'. The background of the discussion was that, actually, there is little evidence for improved outcome in patients treated with current β -agonists or phosphodiesterase inhibitors. There is therefore growing interest in finding alternative therapeutic agents to treat patients with acute heart failure. Levosimendan is a calcium sensitizer with a dual mechanism of action. It sensitizes troponin C to calcium, leading to an improvement in contractility during systole. As such, decreased calcium availability during diastole leads to better diastolic relaxation by avoiding diastolic calcium overload. Both of these phenomena

result in improved contractility at a lower energy cost. Moreover, to a degree, levosimendan also has vasodilator properties by activating adenosine triphosphate–potassium sensitive channels. With its unique inotropic and vasodilatory properties, levosimendan can increase cardiac output without increasing myocardial oxygen demand. A recent study [5] showed its efficacy and safety as compared with dobutamine in patients with severe cardiac failure.

Poster awards

The European Society of Intensive Care Medicine chose seven poster award winners (titles given in the headings below).

Documentation of respiratory rate for acutely sick hospital in-patients: an observational study

This study [6] showed that it is important that respiratory rate be monitored, and that it should be recorded regularly in ward patients because an increased rate is a possible sign of impending clinical deterioration.

NOSOREF: a French survey of nosocomial infections surveillance in intensive care units

This survey [7] showed significant differences in surveillance and diagnosis of nosocomial infections in 244 surveyed ICUs. Of the ICUs, 72% specifically reported nosocomial infections and 77% performed searches for multiresistant bacteria at ICU admission.

Inhibition of neutrophil chemotaxis by protein C and activated protein C

The conclusion of this study [8] was that protein C and activated protein C can inhibit neutrophil chemotaxis. The results also suggest that neutrophils express endothelial protein C receptor, signalling antimigratory stimuli.

Episepsis study: French severe sepsis epidemiology in 2001

This epidemiological study [9] included 3833 patients, 17.3% of whom developed severe sepsis. Actual hospital mortality for these patients was 44%. Of the patients, 11% were still hospitalized at 2 months.

Spanish study of organ dysfunction and its evaluation with the daily SOFA score

Daily assessment of Sepsis-related Organ Failure Assessment (SOFA) score during the 5 days following admission was useful in predicting hospital mortality in ICU patients in this study [10]. The authors also developed a model including SOFA max (maximum value), SOFA min (minimum value), SOFA tend (tendency) and age that was able to produce a receiver operating curve with $r=0.811$.

Hepatic venous gas and free radical as indicator of oxygen metabolism during hepatic arterial clamp

This animal study [11] showed that portal hepatic venous oxygen, oxygen content and hepatic venous oxygen

saturation, but not pH, decreased after hepatic artery clamping. Hepatic venous oxygen saturation was also related to hepatic parenchymal oxygen metabolism.

Efficacy of recombinant erythropoietin in the critically ill

This prospective, multicentre, randomized, double-blind, controlled trial of 1302 patients compared the use of human recombinant erythropoietin with placebo [12]. Patients who received the therapy were less likely to be transfused (relative risk 0.84, 95% confidence interval 0.76–0.92) than were the placebo group. The treated group also received fewer red blood cell units when they were transfused, and the increase in haemoglobin was greater. However, mortality was not different between the groups.

Next year

Next year, the 16th Annual Congress will be held in Amsterdam, and the motto will be 'Scientific foundation for clinical excellence'. We hope that the meeting will encourage intense exchange between participants, as it did this year.

Competing interests

None declared.

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