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Related prognostic factors in elderly patients with severe sepsis and septic shock

Análise exploratória dos fatores relacionados ao prognóstico em idosos com sepse grave e choque séptico

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ABSTRACT

Objectives: The objective of this study was to evaluate variables related to intra hospital mortality at 28 days, of aged persons with severe sepsis and septic shock in a clinical ICU.

Methods: One hundred and fifty-two patients aged ≥ 65 years with severe sepsis and septic shock were followed for 28 days and the variables were collected on days 1, 3, 5, 7, 14 and 28 of stay. To compare categorical variables the Chi-square test was used and the Mann-Whitney or t test for continuous variables. All tests were double-tailed, alpha error of 0.05.

Results: Mean age was 82.0 ± 9.0 years and 64.5% were female. Mortality was of 47.4%. Related to death were the following: Acute Physiological and Chronic Health Evaluation II score ($p < 0.001$), Sequential Organ

Failure Assessment score on days 1, 3, 5, 7 ($p < 0.001$), length of stay in intensive care ($p < 0.001$), number of organ failures ($p < 0.001$), high serum lactate on day 3 ($p = 0.05$), positive troponin I ($p < 0.01$), echocardiographic variables (systolic diameter $p = 0.005$; diastolic diameter $p = 0.05$; shortening fraction $p = 0.02$), previous renal disease ($p = 0.03$), shock ($p < 0.001$), mechanical ventilation ($p < 0.001$) and Lawton scale ($p = 0.04$).

Conclusions: Shock, elevated lactate, organ failure, especially respiratory were more prevalent in non-survivors. Heart dysfunction detected by echocardiographic variables and positive troponin I may play an important role in the mortality of aged patients with sepsis.

Keywords: Septic shock; Aged; Prognosis; Sepsis

INTRODUCTION

In Brazil, as well as in developed countries, a phenomenon known as demographic transition is taking place. It is the result of a decreased birth rate and increased longevity of the population.⁽¹⁾ As such, there is an increasing number of aged patients admitted to intensive care units (ICU).⁽²⁾

Aging is a subject of increasing interest, because of the clinical peculiarities of patients in this age bracket and of the greater medical and financial requirements involved. However, variables related to prognosis of the critically ill aged are not fully explained. Age,⁽³⁾ presence of comorbidities,⁽⁴⁾ organ dysfunctions,⁽⁵⁾ need of amines⁽⁶⁾ and quality of life⁽⁷⁾ obtained by means of functional scales, have been addressed, however with discrepant results in the published studies.

In the context of severe illness, sepsis is worthy of note with a high prevalence in the aged.⁽⁸⁾ Its aftermaths may be disastrous, as alterations peculiar to senescence reduce physiological and organ reserves.⁽⁹⁾ Thus, it became more important to know the physiology of aging, chronic diseases that affect aged patients and factors related to their mortality.

The objective of this study was to carry out an explanatory analysis of the factors related to mortality of patients aged 65 years or more, admitted with a diagnosis of severe sepsis or septic shock in a clinical intensive care unit.

METHODS

After approval by the Ethics Committee of the Hospital Universitário Clementino Fraga Filho da Universidade Federal do Rio de Janeiro (UFRJ), this study was carried out at the ICU of a private hospital in the city of Rio de Janeiro. There are nine beds of intensive care for non-surgical patients with a mean length of stay is 440 ± 19.49 patients per year, in addition to a teaching and training activity in intensive care for medical students. The aged correspond to at least 2/3 of admitted patients and patients requiring surgical intervention correspond to at least 5% referred to another unit.

From August 2004 to September 2007, consecutive patients with ≥ 65 years and diagnosis of severe sepsis or septic shock were followed up during 28 days. Treatments of patients were defined by their assistant physician and a medical team of the hospital, all specialists in intensive care, with no interference by researchers.

Whenever severe sepsis or septic shock were suspected in the ICU, the physician on duty contacted the head researcher to comply with the established criteria for inclusion in the study. Sepsis was defined according to the 1992 consensus conference,⁽¹⁰⁾ when the systemic inflammatory response syndrome (at least two of the following criteria: body temperature $> 38^\circ\text{C}$ or $< 36^\circ\text{C}$; heart rate $> 90\text{bpm}$; respiratory rate > 20 irpm or $\text{PaCO}_2 < 32$ mmHg; leukocytes > 12.000 cells/mm³ or < 4.000 cells/mm³ or still, more than 10% of young form), was associated to the infectious focus documented by blood culture, bronchoalveolar lavage or tracheal aspirate and urine. Severe sepsis was characterized by sepsis associated to arterial hypotension (systolic arterial pressure $< 90\text{mmHg}$ or decrease of 40mmHg from the initial systolic arterial pressure), responsive to volume re-

placement. Other characteristics that define severe sepsis were not considered for diagnosis, because they could concur with alterations common to senescence or to base diseases. Septic shock was considered when hypotension was refractory to volume replacement, carried out according to the physician in charge of initial care, with a consequent need for vasopressors. In all patients, baseline was the finding of arterial hypotension (time zero).

Patients needing surgical intervention were referred to another unit and excluded from the study. Metastatic neoplasia, immunosuppressive therapies and acquired immunodeficiency syndrome (AIDS) were also considered exclusion criteria, as sepsis itself could be a consequence of immunodepression inherent to these conditions. Those who died in less than 24 hours were excluded, due to the impossibility to conclude the requested tests in the first day, as well as those that, due to ethical principles did not agree to sign the informed consent (IC).

If the patient was selected for the survey, the process of completing the protocol, suitable for this study was begun, in addition to collection of data with relatives, assistant physician and signing of the IC. The protocol was completed prospectively, without knowledge of the outcome in 28 days, by the head researcher and three medical students trained by the researcher. All completed protocols were re-evaluated and reviewed by the head researcher and a continued training was carried out whenever collaborators had any doubts. The protocols were provided by the hospital. The study coordinator and other researchers did not receive any financial support.

Choice of the analyzed variables was made from data published in literature that related them to mortality in aged patients in intensive care units. Previous diseases were considered according to the description of the patient, relatives or assistant physician and according to the patients regular use medication. Previous admission was designated when the patient was already in-hospital or was coming from another rest home or home care. The basic activities of daily living scale (Katz scale)⁽¹¹⁾ and the instrumental activities of daily living scale (Lawton scale)⁽¹²⁾ were adapted to define the functional status prior to ICU admission, and could result in three levels of dependency, partial, total or no dependency.

The Acute Physiologic Chronic Health Evaluation (APACHE) II⁽¹³⁾ and Sequential Organ Failure Assessment (SOFA)⁽¹⁴⁾ scores were made with the Glasgow

coma scale⁽¹⁵⁾ calculated before sedation. SOFA, leukogram, total bilirubin (TB), C-reactive protein (CRP) and lactate were analyzed on days 1 (D1), 3 (D3), 5 (D5), 7 (D7), 14 (D14) and 28 (D28) of stay. Albumin was dosed on the first day of admission. The delta SOFA 3-1 was calculated by numeric subtraction of the third day SOFA from the first day SOFA.

Troponin I and creatinine kinase fraction MB mass (CKMB mass) were performed on the first and third days. The B-type natriuretic peptide (BNP) was dosed during the first 72 hours after admission. Echocardiography was made between days 1 and 5 of stay. In the case of tests collected more than once a day, the worst value of the 24 hours was used for recording of data.

Organ failures were defined according to Le Gall et al.⁽¹⁶⁾ criteria. To the organ failure criteria were added positive troponin I, systolic dysfunction at echocardiography (not previously recorded) and dosing of increased type-B natriuretic peptide. Should the patient have evolved with presence of three or more of the cited criteria, he was considered as the bearer of heart failure. Hyperglycemia was considered when there was an increase of glucose > 150 mg/dL in three or more measurements, including capillary glycemia (routinely performed every 6 hours).

For comparison of the categorical variables between survivors and non-survivors, the Chi-square test was used, with the Pearson's or Fisher's exact test when appropriate.

For continuous variables the Mann-Whitney test was used. Tests were two-tailed with an alpha error of 0.05. The statistical software SPSS for Windows (Chicago IL, version 11.0) was used for data analysis.

RESULTS

One hundred and sixty seven patients, were assessed, of which 15 were excluded: 6 with a diagnosis of metastatic neoplasia, 4 who died in less than 24 hours, 4 surgical patients and one whose family refused to sign the IC.

The study included 152 patients with ages ranging from 65 to 103 years with 64.5% of women, as shown in table 1. Mean age of studied patients was 82.0 ± 9.0 years. Mean ICU length of stay was of 17.4 days for survivors and 11.9 for non-survivors, presenting relation with mortality (p<0.001).

The majority of patients presented septic shock at admission (73.7%) related to death (p<0.001). Overall mortality was of 47.4% of these, 93.1% of patients who died, had a diagnosis of septic shock and 6.9% of severe sepsis. About 84% of patients had an initial diagnosis of pulmonary sepsis and 32.2% of urinary sepsis, both more prevalent, with positive cultures in 75% of cases.

As shown in table 1, cardiovascular diseases had a high prevalence (76.3%) followed by neurological disease (40.8%). Additional data regarding comorbidities

Table 1 – Descriptive characteristics on the first day, according to death at 28 days

Characteristics	Survivors		Non- survivors		Total		P value	OR	CI 95%
	%	(n)	%	(n)	%	(n)			
Female gender	62.5	(50)	66.7	(48)	64.5	(98)	0.59	0.83	0.42-1.62
Shock	56.3	(45)	93.1	(67)	73.7	(112)	< 0.001	10.42	3.79-28.62
Systemic arterial hypertension	63.8	(51)	68.1	(49)	65.8	(100)	0.58	1.21	0.61-2.37
Coronary arterial disease	31.3	(25)	37.5	(27)	34.2	(52)	0.41	1.32	0.67-2.58
Stroke	30.0	(24)	20.8	(15)	25.7	(39)	0.20	0.61	1.29-1.29
COPD	16.3	(13)	15.3	(11)	15.8	(24)	0.87	0.92	0.38-2.22
Diabetes mellitus	25.0	(20)	26.4	(19)	5.72	(39)	0.84	1.07	0.51-2.22
Degenerative neurological disease*	46.3	(37)	34.7	(25)	40.8	(62)	0.15	0.61	0.32-1.19
Renal disease	7.50	(6)	19.4	(14)	13.2	(20)	0.03	2.97	1.07-8.22
Home care	18.1	(13)	28.8	(23)	23.7	(36)	0.12	0.54	0.25-1.18
Total dependency "Lawton scale"	51.4	(37)	67.5	(54)	59.8	(91)	0.04	0.50	0.26-0.98
Pulmonary sepsis	78.8	(63)	90.3	(65)	84.2	(128)	0.05	2.50	0.97-6.45
Urinary sepsis	37.5	(30)	26.4	(19)	32.2	(49)	0.14	0.59	0.29-1.19

COPD - Chronic obstructive pulmonary disease; OR – Odds ratio; CI – Confidence interval; *Degenerative neurological disease includes Parkinson and Alzheimer diseases

and functional status are also presented on this table.

Clinical characteristics related to severity of presentation of sepsis are shown in table 2. It can be seen that mean of the first day SOFA was higher for those that died ($p < 0.001$), the same was true for SOFA3. The delta SOFA was also related to higher mortality.

Non-survivors presented a greater number of failures according to the Le Gall et al.⁽¹⁶⁾ criteria ($p < 0.001$). Respiratory failure was present in 95.8% of non-survivors and need for invasive mechanical ventilation at any time of the 28 days, related with higher mortality ($p < 0.001$; OR-15.33; CI 95% - 4.44 to 52.95).

Hyperglycemia took place in 70.4% of patients and was not related to a greater probability of death ($p = 0.16$). Table 3 shows that for mean of lactate on the first day, no significant difference was found between survivors and non-survivors ($p = 0.23$), contrary

to that on the third day ($p = 0.05$). Mean of CRP did not differ in survivors and non-survivors, in any of the measurements (D1 $p = 0.68$; D3 $p = 0.29$; D5 $p = 0.51$; D7 $p = 0.66$; D14 $p = 0.31$ and D28 $p = 0.85$).

Contrariwise, leukocyte count showed a difference in relation to mortality with significantly lower values in survivors on the third ($p = 0.04$), fifth ($p = 0.01$), seventh ($p < 0.01$) and fourteenth day ($p = 0.05$) of stay.

Table 4, shows variables related to cardiovascular dysfunction. Troponin I on the first day was positive in 21.3% of survivals and 40.3% of those that died disclosing a statistically significant difference with a greater mortality on D1 ($p < 0.01$) and D3 ($p < 0.01$) of stay. CK mass was statistically significant in relation to death, while it remained elevated on the third day of stay ($p = 0.03$). Mean of BNP was not statistically different among groups. Echocardiographic variables are listed on table 4.

Table 2 – Clinical characteristics of the population regarding disease severity, according to death at 28 days

Characteristics	Survivors		Non-survivors		P value
	Mean and SD	(n)	Mean and SD	(n)	
APACHE II	17.29 ± 4.78	(80)	20.61 ± 6.52	(72)	< 0.001
SOFA1	6.04 ± 3.27	(80)	8.56 ± 3.19	(72)	< 0.001
SOFA3	5.04 ± 3.06	(80)	9.25 ± 4.08	(69)	< 0.001
Delta SOFA 3-1	-1.0 ± 2.00	(80)	0.42 ± 2.37	(69)	< 0.001
Number of failures*	1.71 ± 1.29	(80)	3.50 ± 1.22	(72)	< 0.001

APACHE - *Acute Physiologic Chronic Health Evaluation*; SOFA1 - *Sequential Organ Failure Assessment* at day one; SOFA3 - *Sequential Organ Failure Assessment* at the third day. * Le Gall criteria.

Table 3 – Laboratory variables, according to death at 28 days

Characteristics	Survivors		Non-survivors		P value
	Mean and SD	(n)	Mean and SD	(n)	
Glucose					
D1	132.8 ± 58.3	(80)	199.2 ± 92.2	(72)	0.16
Lactate					
D1	2.10 ± 1.28	(80)	2.67 ± 2.28	(72)	0.07
D3	1.94 ± 0.76	(77)	2.83 ± 3.04	(66)	0.02
CRP					
D1	49.30 ± 31.19	(80)	50.84 ± 26.95	(72)	0.75
D3	52.80 ± 23.52	(77)	56.45 ± 22.69	(66)	0.35
Leukocytes					
D1	13185.00 ± 6730.36	(80)	15030.56 ± 8092.12	(72)	0.13
D3	13402.50 ± 6526.61	(77)	16213.43 ± 8900.71	(66)	0.03
D5	11308.22 ± 5685.04	(69)	14750.90 ± 8455.15	(51)	0.01
D7	11289.34 ± 5254.92	(62)	15188.85 ± 7299.21	(47)	0.002
D14	12350.20 ± 4286.56	(44)	14476.19 ± 6804.84	(19)	0.02

CRP- C-reactive protein; SD – standard deviation

Table 4 – Variables indicative of cardiovascular dysfunction according to death at 28 days

Characteristics	Survivors		Non-survivors		P value
	Mean ± SD	(n)	Mean ± SD	(n)	
Ejection fraction	64,16 ± 16,16	(55)	59,79 ± 14,90	(47)	0,16
Systolic diameter LV	2,93 ± 0,92	(59)	3,55 ± 1,23	(47)	<0,01
Diastolic diameter of LV	4,68 ± 0,96	(59)	5,07 ± 1,05	(47)	0,05
Shortening %	0,37 ± 0,12	(59)	0,30 ± 0,17	(47)	0,02
CK mass D1	4,11 ± 10,55	(79)	5,00 ± 7,74	(71)	0,56
CK mass D3	4,40 ± 7,29	(69)	8,90 ± 14,38	(63)	0,02
Troponin I D1	1,24 ± 5,93	(80)	2,15 ± 6,26	(72)	<0,01
Troponin I D3	1,07 ± 3,47	(74)	5,33 ± 14,19	(64)	<0,01
BNP	668,13 ± 832,80	(37)	757,72 ± 568,88	(33)	0,60

LV – Left ventricle ; CK – creatinine kinase; BNP – type B natriuretic peptide; D - day

DISCUSSION

According to Vosylius et al.⁽¹⁷⁾ in the majority of studies published on the aged admitted in the ICU, age was related to a greater probability of death. This was indeed often influenced by a greater number of comorbidities, more severe presentation of diseases, impaired health functional status and different therapeutic approaches to the aged.

In this study, prior diseases were very common, similar to the studies by Tang et al.⁽¹⁸⁾ in the aged population, and only renal disease was statistically different among groups (Table 1). Van den Noortgate et al.⁽¹⁹⁾ showed that previous renal disease played a significant role in relation to death, facilitating evolution to renal failure as part of the outcome. This was also shown by Harrison et al.⁽²⁰⁾ in patients with systemic inflammatory response syndrome (SIRS). Rockwood et al.⁽²¹⁾ in 1993, showed that the higher number of comorbidities in the aged were a probable cause of the increased organic dysfunctions when compared to the young. In the “aging fragility syndrome” progressive drop of the functional capacity of organs is foreseen with the passing of years, which added to comorbidities could lead to earlier organ dysfunction when faced by a major aggressive insult such as sepsis, with worse prognosis.

Functional limitation according to the Lawton scale was statistically different between groups (Table 1), substantiating the idea that factors related to quality of life of the aged should be assessed during ICU stay. Chelluri et al.⁽²²⁾ and Boumendil et al.⁽²³⁾ made use of different functional scales concluding that the high level of dependency prior to admission was related to higher mortality, as well as to the level of cognitive deficit. Kass et al.⁽²⁴⁾ during a one year follow-up,

however, showed that the functional status prior to admission was not a death risk factor and, that after discharge, survivors recuperated the same level as before admission. Regardless of these authors' conclusions, we believe that intensive care work at “senior citizen age” must include analysis of the functional scales status and quality of life, since increasingly, the culture limit will impose itself in view of the aged population growth. Thus, despite the progress of medical technology, intensive support would be restricted to patients with reversible diseases, not turned into an indefinite and indignant delay of death which would comply with the concepts of medical ethics.

Length of stay was significantly shorter for patients that died ($p=0.001$) and APACHE II was higher in the non-survivors (Table 2), supporting the premise that critically ill patients die earlier.⁽¹⁷⁾ Kaarlola et al.⁽²⁵⁾ showed that APACHE II, when used with exclusion of the variable age, was significantly higher in patients who died, suggesting that the most important factor in the index is deviation from normality of the physiological variables known as the Acute Physiology Score (APS). Criticism of utilization of APACHE II for different groups of patients alleges that specific indices for given populations must be sought, considering physiological differences, previous characteristics and interventions, which are not measured by this score,⁽²⁶⁾ however, in this sample it was related to the worst outcome.

Incidence of organ failure according to SOFA criteria, as well as Le Gall et al.⁽¹⁶⁾ was high (Table 2). Chelluri et al.⁽²²⁾ Bo et al.⁽²⁷⁾ and Tang et al.⁽¹⁸⁾ described that mortality was proportional to the number of organ dysfunctions, a fact that was repeated in this work. SOFA's of the first and third days were related to higher mortality (Table 2). Their authors had already shown that the index may be utilized to define

the level of dysfunction of various organs, at different times of the same stay, ensuring a dynamic overview of the disease.^(28,29) Likewise, the SOFA delta was statistically related to mortality: when there was a worsening of the dysfunction, notwithstanding treatment (increase of the delta SOFA), the majority of patients died. This fact substantiates similar studies⁽³⁰⁾ suggesting that efficiency of therapy and preventive measures to avoid failure of a given organ may be measured by the delta SOFA, with impact on mortality.

The lactate on the third day of stay was significantly higher in non-survivors. It is known that increase or maintenance of lactate at high levels adds a worsening to prognosis, thereby becoming part of the initial identification of the patient with severe infection, who require early treatment.⁽³¹⁾ As shock is the most probable reason for the lactate levels remaining high and for new organ dysfunctions, in this sample it was related to death (Table 3). CRP was not related to death in any of the measurements. Recent studies signal that the ultra-sensitive C-reactive protein is a good marker for follow-up of ventilator-associated pneumonias,⁽³²⁾ as well as a marker of response to treatment in severe community acquired pneumonia.⁽³³⁾ However in the present study, its mean did not differ between survivors and non-survivors, contrary to leukocytes. Not enough papers were found in literature to explain this fact, but it seems that immunosenescence which takes place in such patients is involved.⁽³⁴⁾ Larger studies of a specific population of diseased aged with severe sepsis and septic shock must be undertaken to evaluate if these results are repeated, leading to a more definitive conclusion.

Among the organ dysfunctions, evolution with respiratory failure requiring invasive mechanical ventilation was related to higher mortality. Cohen et al.,⁽³⁵⁾ in 1998, already showed that need for mechanical ventilation, during stay in the ICU was related to death of the aged, a fact possibly related to complications such as ventilator-associated pneumonia or misuse of the breathing mask.⁽³⁶⁾

Regarding variables related to the cardiovascular system, increase of troponin I and of CK mass on the third day, systolic and diastolic diameters, in addition to shortening percentage at echocardiography, were statistically different for survivors and those who died (Table 4). Although previous studies concluded that acquired heart failure may be an important prognostic factor in critically ill aged,⁽³⁷⁾ such alterations cannot be extrapolated for the conclusion that a myocardial injury is only caused by sepsis, since prevalence of cardiovascular disease is high in the aged. These data may be important in the search for prognostic indices using variables of the first hours of

admission, as myocardial dysfunction is one of the earliest failures in the overall setting of sepsis. Vieillard-Baron et al.,⁽³⁸⁾ in 2006, showed that in patients with septic shock, under mechanical ventilation, qualitative echocardiographic assessment could detect respiratory variations of the inferior vena cava, systolic dysfunction of the left ventricle and right chambers dilatation, as a useful tool for management of circulation failures due to septic shock. Jones et al. showed that transesophageal echocardiography in the emergency room on patients with hypotension with undefined cause, had a 94% specificity for diagnosis of sepsis.⁽³⁹⁾ Furthermore it was able to detect hyperdynamic heart failure, common at the initial stages of sepsis. Jardin et al.,⁽⁴⁰⁾ also concluded that, in most septic patients who survive the initial shock episode, systolic function of the left ventricle was more impaired than in those who died. Thus, it appears that echocardiography plays a role in the assessment of hemodynamic responses as well as in the instituted therapies, regarding prognosis of patients with sepsis. Due to technical shortcomings (only qualitative analysis), only 70% of patients in this sample were submitted to echocardiography in the first five days after admission, corresponding to more than 10% of loss, the maximum for cohort studies. Nevertheless, due to the clinical relevance, as it is a non-invasive exam, we considered its statistics acceptable and the relation with prognosis, understanding that the increase of the sample may bring forth more adequate conclusions.

BNP has proven a potential factor for prognosis determination. Post et al, showed that dosage on the fifth day after development of sepsis is related to systolic dysfunction at echocardiography and to mortality, but this is not true for dosage on the first day.⁽⁴¹⁾ In this study, dosage of BNP was carried out at any time in the first 72 hours of sepsis, possibly with patients at different stages of evolution of the myocardial dysfunction, therefore influencing its prognostic analysis. Furthermore, the echocardiography was made in the first five days of sepsis, so that no comparisons could be made, leading only to individual analysis regarding mortality.

Only clinical patients were included in this study, surgical patients were referred to another ICU of the institution. This may be considered to be a limitation, because patients with abdominal or postoperative sepsis were not assessed. However, respiratory and urinary infections are the major causes of sepsis in the aged,⁽³⁾ adding to the relevance of this study.

It is known that any signs of organ dysfunction such as lowering of level of consciousness, oliguria, thrombocytopenia, associated to evidence of infection sug-

gest severe sepsis. However, this work used only arterial hypotension as inclusion criterion. Considering that this population commonly presents previous functional or cognitive deficits, this single criterion was elected aiming to even out the severity of patients, considering it a limitation, since patients with severe sepsis without hypotension were not assessed in this sample and may have a different behavior to the approached one.

Charlson et al.⁽⁴²⁾ developed a comorbidity index which takes into account the number as well as severity of the base diseases and achieves to predict mortality in one year of the in-hospital ill. It has been broadly used for aged patients, however, it was perceived that its value in cortically ill patients was limited in addition to the difficulty of application in the intensive care units. As such, it was not used in this study, which many may interpret as a shortcoming. Besides the listed shortcomings, this work is only an exploratory analysis of the variables related to mortality of aged patients with severe sepsis and septic shock. Thus, a multivariate analysis would be more adequate to reach a more precise decision about the influence of these variables on the outcome.

CONCLUSION

As such, despite shortcoming, it was concluded that continued high lactate, sum of organic failures, shock, need for mechanical ventilation and previous renal disease at admission were related to mortality of aged persons with severe sepsis or septic shock during stay in a clinical ICU. Echocardiography and dosage of troponin I may be useful tools to detect early cardiovascular failure in the aged and are related to higher mortality. Furthermore, definition of functional status

and quality of life prior to admission must be included in the assessment of prognosis of the aged requiring intensive care.

RESUMO

Objetivos: O objetivo deste estudo foi avaliar variáveis relacionadas à mortalidade intra-hospitalar em 28 dias, de idosos com diagnóstico de sepse grave ou choque séptico em unidade de terapia intensiva clínica.

Métodos: Cento e cinquenta e dois pacientes, com idade \geq 65 anos internados com sepse grave ou choque séptico foram acompanhados durante 28 dias e as variáveis foram coletadas nos dias 1, 3, 5, 7, 14 e 28 de internação. Para a comparação das variáveis categóricas, empregaram-se os testes Qui-quadrado e para as variáveis contínuas o teste de Mann-Whitney ou teste T, quando apropriado. Todos os testes foram bicaudais com erro alfa de 0,05.

Resultados: A média da idade foi de $82,0 \pm 9,0$ anos, com 64,5% de mulheres, sendo a mortalidade de 47,4%. Foram relacionados ao óbito: índice *Acute Physiologic and Chronic Health Evaluation II* ($p < 0,001$), o *Sequential Organ Failure Assessment* nos dias 1, 3, 5, 7 ($p < 0,001$), o tempo de permanência na terapia intensiva ($p < 0,001$), o número de falências orgânicas ($p < 0,001$), o lactato elevado no terceiro dia ($p = 0,05$), troponina I positiva nos dias 1 e 3 ($p < 0,01$), o ecocardiograma (diâmetro sistólico $p = 0,005$; diâmetro diastólico $p = 0,05$; percentual de encurtamento $p = 0,02$), doença renal prévia ($p = 0,03$), necessidade de aminas ($p < 0,001$), o uso de ventilação mecânica ($p < 0,001$) e escala de Lawton ($p = 0,04$).

Conclusões: Choque, lactato elevado e falências orgânicas, especialmente falência respiratória, foram mais prevalentes nos não sobreviventes. Falência cardiovascular, detectada pelo ecocardiograma e troponina I positiva, pode ter importante papel na mortalidade de idosos com sepse.

Descritores: Choque séptico; Idoso; Prognóstico; Sepse

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