

Denison de Oliveira Couto¹, Carlos Augusto Ramos Feijó², Sabine Mustafa Aguiar³, Francisco Albano de Meneses⁴

Characteristics of patients with systemic lupus erythematosus admitted to the intensive care unit in a Brazilian teaching hospital

Perfil dos pacientes com lúpus eritematoso sistêmico, internados na unidade de terapia intensiva de um hospital universitário de Fortaleza

1. Resident Physician in Intensive Medicine from the Hospital Universitário Walter Cantídio (HUWC) of the Universidade Federal do Ceará – UFC, Fortaleza(CE), Brazil.
2. Assistant Physician of the Intensive Care Unit from the Hospital Universitário Walter Cantídio (HUWC) of the Universidade Federal do Ceará – UFC, Fortaleza (CE), Brazil.
3. Physician of the Hospital Universitário Walter Cantídio (HUWC) of the Universidade Federal do Ceará – UFC, Fortaleza (CE), Brazil.
4. Masters, Supervisor of Medical Residence in Intensive Medicine of the Hospital Universitário Walter Cantídio (HUWC) of the Universidade Federal do Ceará – UFC, Fortaleza(CE), Brazil.

Received from the Intensive Care Unit of the Hospital Universitário Walter Cantídio (HUWC) – Universidade Federal do Ceará – UFC, Fortaleza (CE), Brazil.

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Address for correspondence:

Dr. Carlos Augusto Ramos Feijó
Rua Tibúrcio Cavalcante, 810/501 –
Meireles
60125-100 Fortaleza, (CE), Brazil.
Phone: (85) 3268-3074
E-mail: cfeijo2001@yahoo.com.br

ABSTRACT

Objectives: Due to the high incidence in our service, we did object on this study describe the features and outcome of patients with systemic lupus erythematosus (SLE) admitted to the intensive care unit of Walter Cantídio University Hospital

Methods: Patients were retrospectively characterized according to demography parameters, time of diagnosis of SLE, organ dysfunction and laboratorial parameters at admission, supportive therapies during their stay, length of stay in the hospital before admission, length of stay in the unit, readmission to the unit and outcome. We also evaluated Systemic Lupus Erythematosus Disease Activity (SLEDAI) score, Acute Physiology and Chronic Health Evaluation II (APACHE II) score, expected mortality and standardized mortality ratio.

Results: From November 2003 to October 2006, 1,052 patients were admitted to the intensive care unit. Fifty patients had SLE and were included in this retrospective study. Of the 50 patients with SLE admitted to the ICU, 88.2% were female. The mean age was 30.3 ± 12.8 years. The median time of diagnosis of SLE was 67 months. The most common organ dysfunctions were renal

(70.6%), cardiovascular (61.8%), respiratory (55.9%) and neurological (55.9%). The main reasons for admission to the ICU were respiratory (38.2%), cardiological (29.4%) and neurological (29.4%) dysfunctions. Among the intensive care therapies, 44.1% of the patients needed blood products, 41.2% vasopressor agents and 35.3% mechanical ventilation, 23.5% dialysis. The mean SLEDAI score was 15.0 ± 12.2 . The mean APACHE II score was 19.3 ± 6.8 , with a predicted mortality rate of 37.6%. The actual mortality rate in ICU was 29.4%, with 8.8% before 48 hours. The standardized mortality ratio was 0.78. Patients with APACHE II > 18, with more than 3 acute organ involvements, leukopenia (< 4000 cells/mm³) and gastrointestinal or metabolic involvement had higher mortality in the intensive care unit.

Conclusion: Although the severity of patients at admission to the ICU, demonstrated by APACHE II and the acute dysfunctions, the outcomes of analysed patients suggest susceptibility to the therapy.

Keywords: Lupus erythematosus, systemic/complications; Lupus erythematosus, systemic/mortality; Intensive care; Intensive care units; Retrospective studies

INTRODUCTION

Systemic lupus erythematosus (SLE) is an autoimmune disease with a 1.5 to 5 times higher mortality rate than that of the overall population.¹⁻⁴ Patients with SLE may require frequent hospital admissions; according to a former study⁵ more than half of the patients followed-up in daycare units were admit-

ted at least once a year.

Several studies identified negative demographic predictors, including age at onset of the disease,^{1,6-10} gender,^{2,3,11,12} ethnicity,^{9,10} and socioeconomic situation^{13,14} as well as factors related to the disease *per se*, such as renal disease activity,^{1,15} impairment of the central nervous system,³ serositis,¹⁵ hemolytic anemia¹⁶ and thrombocytopenia.¹

Some patients need treatment in intensive care units (ICU) because of infectious, thromboembolic, respiratory, neurological or renal complications. However in literature there are few reports on the subject.^{17,18} That is why we sought to describe the characteristics and evolution of patients with SLE admitted to the ICU of the Hospital Universitário Walter Cantídio (HUWC) – Universidade Federal do Ceará.

METHODS

After approval by the Ethics Committee of the Hospital Universitário Walter Cantídio, a retrospective study was carried out by a survey of all patients with SLE staying at the unit for a defined time period. Requirement for an informed written consent was waived by the Ethics Committee. It is noteworthy that the HUWC at that time did not reckon with an urgency ward and predominantly lodged patients with selective chronic diseases cared for in its clinics – some of them with prior admissions. The diagnoses was based on the reviewed criteria of the America College of Rheumatology, 1997.

Patients were described by demographic data, time of diagnosis of disease, activities of the disease [Systemic Lupus Erythematosus Disease Activity Score (SLEDAI)]¹⁹, organ dysfunctions²⁰ (neurological: changes in the consciousness level; cardiovascular: shock; decompensated heart failure, hypertensive crisis; respiratory: acute respiratory failure, requiring oxygen and/or ventilatory support; gastrointestinal: acute diarrhea; hepatic: increase in hepatic function markers; renal: acute renal failure; metabolic: hydroelectrolytic and acid-base disturbances, hyperglycemia; hematological: anemia and/or acute plateletpenia), laboratory parameters at admission, treatments during ICU stay, ICU length of stay and outcome. The *Acute Physiologic and Chronic Health Evaluation II* (APACHE II) score² was checked upon admission and afterward the predicted mortality and standardized mortality ratio was inferred - defined as the ratio between predicted mortality and actual mortality of patients.

The *SPSS for Windows* (version 11.0) was used to carry out statistical analysis. Mean and standard deviation were calculated for continued variables with normal distribu-

tion; while distribution of the proportions was assessed for discreet variables. Value of $p < 0.05$ was considered significant for all tests.

RESULTS

From November 2003 to October 2006, 1,053 patients were admitted at the HUWC, 50 (4,75%) of whom had a previous diagnosis of SLE. Of the total of patients studied 88.2% were women, with a mean age of 30.3 ± 12.8 years (range: 14-72 years). Mean time of disease diagnosis prior to ICU admission was 63.55 ± 51.89 months (median: 67 months) and the mean SLEDAI was 15 ± 12.23 points (median: 12 points).

On admission, 68% of patients presented with organ dysfunctions, 73% of them with three or more. Those with three or more dysfunctions had a significantly higher mortality than non-bearers of dysfunctions or with a lesser number (88.9% and 11.1% respectively, with $p < 0,05$). Patients were admitted to the ICU most often because of respiratory dysfunction, followed by neurological and cardiovascular dysfunctions (Figure 1). Taking into account all dysfunctions found upon ICU admission, the most prevalent was renal, followed by cardiovascular, neurological and respiratory (Figure 2). Among the factors significantly related to higher mortality, the gastrointestinal dysfunction (100%), leukocyte levels lower than 4,000 cells/mm³ (66.7%) and metabolic changes (66%) were identified.

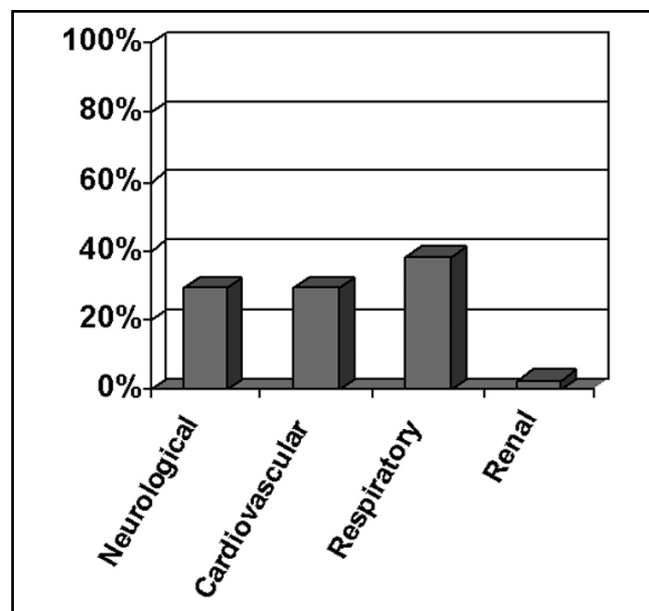


Figure 1 – Acute dysfunctions that led to admission to the intensive care unit.

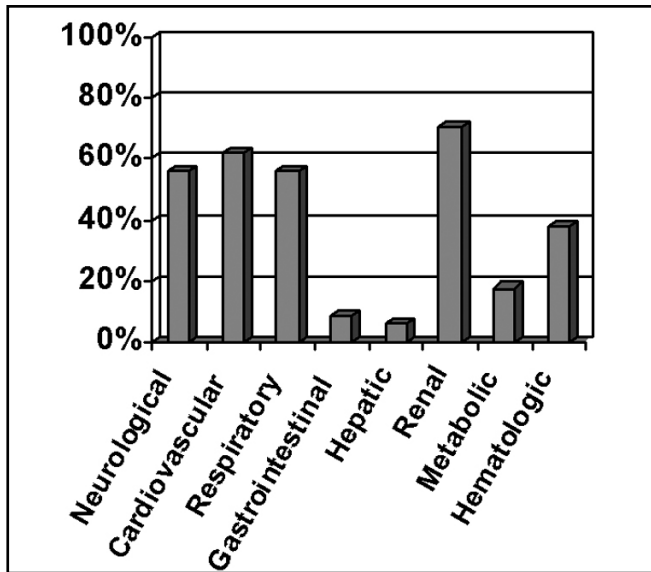


Figure 2 – Acute dysfunctions found on admission to the intensive care unit.

Regarding the support measures adopted during stay, blood products (44.1%) were the most utilized, followed by vasopressor agents (41.2%) and mechanical ventilation (35.3%).

Mean APACHE II score was 19.29 ± 6.77 points, with predicted mortality of $37.55 \pm 20.93\%$. There was a tendency towards more severity in the female gender, when compared to males (mean APACHE II of 19.93 points and 16.33 points, respectively, with $p=0,422$). Patients with an APACHE II score over 18 points (66%) died significantly more than those with less points. Of the patients 71% were transferred from the ICU and 20.6% died after 48h of ICU stay. The standardized mortality ratio was 0.78.

DISCUSSION

In view of the growing demands, knowledge of the profile of patients admitted to the ICU makes management of notoriously scarce resources easier. Studies from various sources stress that chronic patients or the elderly, currently (and more and more in the future) increasingly require admission to the ICU.²² In this study, among chronic patients, a considerable number comes from the Rheumatology service – especially bearers of SLE, a chronic condition with multiple organ dysfunctions.

In our casuistic, a higher prevalence of female patients was identified (90%), similar to that recorded in a more generic context.^{2,3,11,12} The median age of 29.5 corroborates a universal finding,^{1,6,10} while at the same time it disclaims that age *per se* does not provide sufficient pro-

tection to the lupus patient. This endeavors to postulate that, on the one hand, if there are abundant warnings on the inflammatory substrate of the acute critical disease, on the other hand, substantial attention must be paid to this disease noted for its chronic and systemic inflammatory nature.

Severity of the patient was inferred using APACHE II and analysis of organ dysfunctions.

Regarding APACHE II, it has already been applied to a wide variety of patients and acutely morbid situations, however its reliability in a more specific setting may be subject to speculation. Such would be the case of the lupus patient, as previous works addressing the issue are not known. It is perceived that the mean APACHE II was high, more so among women. Nevertheless, the real mean mortality rate remained below the rate predicted by the score. Although critical illness is unquestionable (ratified by dysfunctions) the standardized mortality ratio suggests a benefit of admission to the ICU, in addition to a possible lesser malignancy of the dysfunctions *per se*. Hsu et al.²³, in a recent paper, studying a similar population of lupus bearers (age, gender and APACHE II), identified higher rates of mortality. Despite of a possible bias regarding clinical routines at each service, in addition to greater dysfunctional severity, perhaps a difference inherent to ethnicity can be assumed.

Severity may further be inferred based upon quantitative and qualitative analysis of the dysfunctions identified, as well as the type of supportive treatments. The dysfunction that most often led patients to the ICU was respiratory, substantiating the previous work.²⁴ It is noteworthy however that use of invasive mechanical ventilation ranked third among all these supports – and this can be justified by use of other measures, such as noninvasive mechanical ventilation, early use of antimicrobial agents, adequate physiotherapy techniques, etc. Renal dysfunction is the most relevant of those presented portraying, on the one hand, an immune mediated primary predisposition and, on the other, hastening by overlaying factors (sepsis, drug iatrogenies, etc). Identification of the various support modes highlighted prescription of blood products. As is well known, these patients often course with blood dyscrasia, mainly anemia. As if hemolysis of SLE were not sufficient, once again the role of the complicating etiologies, such as bleeding and anemia of the chronic disease, must be kept in mind.

There are obviously limitations to this study. First, it is a retrospective study jeopardizing a closer identification. Second, casuistic is small and restricted to a single service and does not permit extrapolation of this findings.

CONCLUSION

Patients with lupus entering the ICU under study were critically ill – as suggested by the APACHE II score as well as by the number of dysfunctions. However, real mortality lower than expected one points to a possible susceptibility to the therapeutic measures applied.

RESUMO

Objetivos: Face à demanda de nosso serviço, buscamos descrever as características e a evolução dos pacientes com lúpus eritematoso sistêmico (LES) internados na unidade de terapia intensiva do Hospital Universitário Walter Cantídio.

Métodos: Os pacientes foram, retrospectivamente, caracterizados quanto aos dados demográficos, tempo de diagnóstico da doença, disfunções orgânicas e exames laboratoriais à admissão, suportes terapêuticos usados durante a internação, tempo de internação hospitalar prévio à admissão, tempo de permanência na unidade, reinternações e desfecho evolutivo. Foram avaliados os escores *Systemic Lupus Erythematosus Disease Activity* (SLEDAI) e *Acute Physiological and Chronic Health Evaluation II* (APACHE II) à admissão, a mortalidade prevista e a razão de mortalidade padronizada.

Resultados: No período de novembro de 2003 a outubro de

2006, 1.052 pacientes foram admitidos à UTI, 50 (4,75%) dos quais com LES. Houve predomínio do sexo feminino (88,2%), com média de idade de $30,3 \pm 12,8$ anos. A mediana do tempo de diagnóstico da doença foi de 67 meses. As disfunções mais prevalentes à admissão foram: renal (70,6%), cardiovascular (61,8%), respiratória (55,9%) e neurológica (55,9%). As principais disfunções motivadoras da admissão na unidade de terapia intensiva foram: respiratória (38,2%), cardiovascular (29,4%) e neurológica (29,4%). Os tratamentos mais utilizados foram: hemocomponentes (44,1%), fármacos vasopressores (41,2%), ventilação mecânica (35,3%) e diálise (23,5%). A média do SLEDAI foi $15 \pm 12,2$ pontos e a do APACHE II foi $19,3 \pm 6,8$ pontos, com mortalidade prevista de 37,6%. Registrou-se óbito de 20,6% após 48 horas na unidade de terapia intensiva e 8,8%, com menos de 48h. A razão de mortalidade padronizada foi 0,78. Os pacientes com APACHE II maior que 18 pontos, com mais de três disfunções orgânicas, leucopenia (menor que 4.000 mm^3) e acometimento gastrointestinal ou metabólico falceram significativamente mais.

Conclusões: A despeito da gravidade à admissão na unidade de terapia intensiva, inferida pelo APACHE II e as disfunções agudas, a evolução dos pacientes analisados sugere susceptibilidade às medidas terapêuticas.

Descritores: Lúpus eritematoso sistêmico/complicações; Lúpus eritematoso sistêmico/mortalidade; Cuidados intensivos; Unidades de terapia intensiva; Estudos retrospectivos

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