ABSTRACT NUMBER: 784

# Prediction of Hospital-Acquired Bacterial Infections in Patients with SLE

**Pablo Castaño-Gonzalez**[1], Mauricio Restrepo-Escobar[1,2], Laura Morales-Maya[1], Tomás Urrego[1], Simon Sandoval-Alvares[1], Carlos Horacio Muñoz[1,3], Adriana L Vanegas[1,3], Daniel Jaramillo[1,4], Gloria Vasquez[1] and Luis Gonzalez-Naranjo[1], [1]Division of Rheumatology, Department of Internal Medicine, School of Medicine, Universidad de Antioquia, Medellin, Colombia, [2]Hospital Universitario Pablo Tobon Uribe, Medellin, Colombia, [3]Hospital Universitario de San Vicente Fundación, Medellín, Colombia, [4]Hospital Universitario de San Vicente Fundación, Medellin, Colombia

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## SESSION INFORMATION

**Date:** Sunday, October 21, 2018

**Session Title:** Systemic Lupus Erythematosus – Clinical Poster I: Clinical Manifestations and Comorbidity

**Session Type:** ACR Poster Session A

**Session Time:** 9:00AM-11:00AM

**Background/Purpose:** Patients with SLE have an increased risk of serious infections, including nosocomial infections, which are associated with potentially modifiable adverse outcomes. Our objective is to develop a prognostic prediction model of hospital-acquired bacterial infections in patients with SLE.

**Methods:** A retrospective cohort of patients with SLE, classified according to the ACR criteria of 1987, with an age ≥ 16 years, hospitalized for ≥4 days for reasons other than bacterial infection in a university hospital between 2011 and 2016 was analyzed. Potential predictors were clinical and laboratory variables obtained during the first hours of hospitalization and selected by review of the medical literature. We compared the episodes in which at least one bacterial infection requiring intravenous antibiotics was diagnosed between days 3 and 15 of hospitalization with those who did not present this outcome. The significant variables in the univariate analysis and with absent data ≤ 20% were included in a multivariate logistic regression model and finally the best performance prediction model was chosen with the most reasonable number of predictors.

**Results:** 579 hospitalizations were included, 12.4% (n = 72) developed the outcome, the most frequent nosocomial bacterial infection was bacteremia (n = 24), followed by urinary tract infections (n = 19) and pneumonia (n = 13). The main isolated bacteria were Escherichia coli (n = 16) and Staphylococcus aureus (n = 15). Table 1 presents the univariate analysis with selected independent variables. The variables incorporated in the final prediction model were: age, first neutrophil count of hospitalization, SLEDAI calculated on admission, use of central catheter in the first 72 hours, mean glucocorticoid dose in last month and use of antimalarial in last 3 months (table 2). By Receiver Operator Characteristic (ROC) analysis, it was demonstrated that the discrimination capacity of our model was acceptable (area under the ROC curve = 0.7475).

**Conclusion:** Our model predicts the risk of developing hospital-acquired bacterial infections in patients with SLE, using relatively simple clinical and laboratory data. One of the most important findings was that the use of antimalarials was associated with a significant reduction in the probability of nosocomial bacterial infection. External validation is required to corroborate the results and prospective studies are necessary to evaluate their clinical usefulness and impact.

*Table 1. Characteristics of patients. Univariate analysis*

| Variable | Absent data | Total (n = 579) | Hospital-acquired bacterial infections (n = 72) | Without Hospital-acquired bacterial infections (n = 507) | p |
|---|---|---|---|---|---|
| Sex (women) | 0 (0%) | 512 (88.4%) | 64 (87.7%) | 448 (88.5%) | 0.829 |
| Age (years) | 0 (0%) | 32 (23) | 37 (25) | 31.5 (22) | 0.085 |
| Duration of the disease (months) | 12 (2%) | 48 (103) | 36 (108) | 48 (102) | 0.270 |
| Charlson Comorbidity Index | 5 (0.8%) | 2 (2) | 2 (2) | 2 (2) | 0.572 |
| Leukocytes (cells/mm3) | 2 (0.3%) | 7000 (4300) | 7900 (5400) | 6800 (4100) | 0.089 |
| Lymphocytes (cells/mm3) | 2 (0.3%) | 1200 (1200) | 900 (1100) | 1200 (1100) | 0.045 |
| Neutrophils (cells/mm3) | 2 (0.3%) | 4700 (3600) | 5700 (5000) | 4600 (3500) | 0.007 |
| CRP (mg/dl) | 96 (16.6%) | 1.5 (3.3) | 2.45 (4.44) | 1.26 (2.99) | < 0.001 |
| ESR (mm/hour) | 234 (40%) | 54 (63) | 60 (61) | 54 (64) | 0.729 |
| Creatinine (mg/dl) | 15 (2.6%) | 0.8 (0.96) | 0.97 82.5) | 0.8 (0.76) | 0.073 |
| Proteins in urinalysis (mg/dl) | 143 (25%) | 37.5 (150) | 112.5 (125) | 25 (150) | 0.107 |
| Albumin (g/dl) | 259 (44.7%) | 3 (1.2) | 2.45 (1.35) | 3.1 (1.15) | < 0.001 |
| Complement C3 (mg/dl) | 118 (20.4%) | 69 (53) | 65 (61) | 71 (52) | 0.113 |

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|---|---|---|---|---|---|
| Complement C4 (mg/dl) | 122 (21.1%) | 11.7 (13) | 10.6 (18) | 11.9 (12.7) | 0.612 |
| Anti DNA (titles) | 155 (26.8%) | 1:20 (160) | 0 (160) | 1:20 (160) | 0.374 |
| Antiphospholipid antibodies | 0 (0%) | 141 (24.4%) | 13 (17.8%) | 128 (25.3%) | 0.163 |
| Active lupus nephritis | 0 (0%) | 209 (36.1%) | 34 (46.6%) | 175 (34.6%) | 0.046 |
| Neuropsychiatric lupus | 0 (0%) | 27 (4.7%) | 2 (2.7%) | 25 (4.9%) | 0.404 |
| SLEDAI | 0 (0%) | 6 (12) | 6 (13) | 5 (11) | 0.112 |
| Bladder catheter | 0 (0%) | 16 (2.8%) | 6 (8.2%) | 10 (2%) | 0.002 |
| Central catheter | 0 (0%) | 37 (6.4%) | 15 (20.6%) | 22 (4.4%) | < 0.001 |
| Alveolar hemorrhage | 0 (0%) | 10 (1.7%) | 3 (4.1%) | 7 (1.4%) | 0.095 |
| Mean glucocorticoid dose in last month - prednisolone equivalent- (mg) | 0 (0%) | 10 (15) | 10 (20) | 8.75 (15) | 0.458 |
| Methylprednisolone pulses | 0 (0%) | 96 (16.6%) | 21 (28.8%) | 75 (14.8%) | 0.003 |
| Cyclophosphamide in last month | 0 (0%) | 57 (9.8%) | 10 (13.7%) | 47 (9.3%) | 0.237 |
| Mycophenolate in last month | 0 (0%) | 94 (16.2%) | 12 (16.4%) | 82 (16.2%) | 0.960 |
| Azathioprine in last month | 0 (0%) | 85 (14.7%) | 11 (15.1%) | 74 (14.6%) | 0.920 |
| Rituximab in last 6 months | 0 (0%) | 10 (1.7%) | 3 (4.1%) | 7 (1.4%) | 0.095 |
| Antimalarial in last 3 months | 0 (0%) | 268 (46.3%) | 21 (28.8%) | 247 (48.8%) | 0.001 |
| Dialysis | 0 (0%) | 64 (11.1%) | 12 (16.4%) | 52 (10.3%) | 0.117 |

Table 2. Variables included in the final prediction model of hospital-acquired bacterial infections in patients with SLE

| Variable | OR | p | IC 95% |
|---|---|---|---|
| Age | 1.0272 | 0.005 | 1.0083-1.0465 |
| Neutrophils | 1.0001 | 0.001 | 1.00005-1.00018 |
| SLEDAI | 1.0531 | 0.003 | 1.0175-1.0901 |
| Central catheter | 5.0763 | 0.000 | 2.3690-10.8775 |
| Antimalarial | 0.4293 | 0.005 | 0.2389-0.7717 |

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