**Background** Past studies suggest that males with lupus nephritis (LN) may have increased rates of end-stage renal disease (ESRD) and mortality compared to females. However studies included few males and were focused on biological differences, not healthcare use. In a nationwide cohort of SLE patients with incident LN, we investigated LN-related outcomes and utilisation by sex.
**Materials and methods** We used the Medicaid Analytic eXtract (MAX) with nationwide billing claims to identify individuals 5–65 years with LN (2000–2004) using a validated algorithm (PPV 80%) and required 12 months without any LN codes to define incident cases. MAX data were linked to the U.S. Renal Data System (USRDS) 2000–2006 to identify ESRD onset. Mortality was determined using National and Social Security Death Index Files (2000–2006). We assessed sex-specific incidence rates and adjusted incidence rate ratios (IRRs) for healthcare utilisation, medications, preventive care and renal biopsies using Poisson regression. We used Fine and Grey proportional hazard models to compare the subdistribution hazard ratios (HRsd) of ESRD by sex accounting for the competing risk of death, and Cox models to compare hazard ratios (HR) of death, adjusted for age and race/ethnicity.
**Results** Of 2576 patients with incident LN, 230 (9%) were male. Mean follow-up was 2.8 (SD 1.5) years for both sexes. Mean age was 30 (SD 16) years among males and 34 (SD 14) years among females ($p < 0.001$). 31% of males and 36% of females underwent renal biopsy ($p = 0.06$). Other than azathioprine use, which was more frequent among females ($p = 0.02$), were no differences in medications or preventive care. Adjusted rates of outpatient and emergency department (ED) visits were lower for males compared to females (IRR 0.81, 95% CI: 0.68–0.98 and 0.88, 95% CI: 0.79–0.99, respectively); hospitalizations were comparable. The five-year cumulative incidence of ESRD was 13% and the HRsd of ESRD for males compared to females was 0.86 (95% CI: 0.53–1.38) in the first two years and 2.21 (95% CI: 1.2–4.1) in the subsequent two years. The five-year cumulative incidence of death was 15% with no difference in HR by sex.
**Conclusions** In this incident LN Medicaid cohort, we found high rates of ESRD and mortality overall, with no differences in ESRD by sex in the first two years but more than twice the risk among males thereafter. Males had lower rates of outpatient and ED visits compared to females. Further studies are needed to understand the relationship between utilisation and long-term outcomes.
**Acknowledgements** Drs. Feldman and Broder contributed equally.

## CE-05 A LONGITUDINAL ANALYSIS OF OUTCOMES OF LUPUS NEPHRITIS IN AN INTERNATIONAL INCEPTION COHORT USING A MULTISTATE MODEL APPROACH

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**Background** Patients with lupus nephritis (LN) may have improvement or deterioration in renal status over time. To capture bidirectional change we used a reversible multistate Markov model to study transitions in glomerular filtration rate (GFR) and proteinuria (PrU) in a prospective, international, inception cohort of SLE patients receiving standard of care.
**Materials and methods** Patients were evaluated at enrolment and annually. GFR states were defined: state 1 (eGFR: >60 ml/min); state 2 (eGFR: 30–60 mL/min); and state 3 (eGFR: <30 ml/min). Similarly, PrU states were defined: state 1 (ePrU: <0.25 gr/day); state 2 (ePrU: 0.25–3.0 gr/day); and state 3 (ePrU: >3.0 gr/day). Multistate models provided estimates of relative transition rates and state occupancy probabilities.
**Results** Of 1,826 SLE patients, 89% were female, 49.2% Caucasian with mean±SD age 35.1 ± 13.3 years. The mean disease duration at enrollment was 0.5 ± 0.3 years and follow-up was 4.6 ± 3.4 years. LN occurred in 700/1,826 (38.3%) patients. The likelihood of improvement in eGFR and ePrU (states 2→1 and 3→2) was greater than deterioration (states 1→2 and 2→3). After 5 years, the estimated transition to ESRD was 62% of patients initially in eGFR state 3 but only 11% from ePrU state 3. The probability of remaining in initial eGFR states 1, 2 and 3 was 85%, 11%, 3% and for ePrU was 62%, 29%, 4%. Male sex ($p = 0.04$) predicted improvement in eGFR states and older age ($p < 0.001$), race/ethnicity ($p < 0.001$), higher ePrU state ($p < 0.001$), higher renal biopsy chronicity score ($p = 0.013$) and baseline anticardiolipin antibodies ($p = 0.039$) predicted deterioration. For ePrU, race/ethnicity ($p = 0.009$), higher eGFR state ($p = 0.011$) and higher renal biopsy chronicity score ($p = 0.015$) predicted deterioration. Positive lupus anticoagulant ($p = 0.006$) and ISN/RPN class V nephritis ($p = 0.013$) were associated with lower improvement rates.
**Conclusions** Multistate modelling in patients with LN generates probability estimates of transitions between disease states that reflect improvement or deterioration in renal outcomes. This approach identifies predictors of change in renal status and can inform clinical trial design by identifying outcomes that new therapeutic interventions for LN should meet or exceed.
**Acknowledgements** Presented on behalf of the Systemic Lupus International Collaborating Clinics (SLICC)

## CE-06 URINARY NEUTROPHIL GELATINASE – ASSOCIATED LIPOCALIN AND MONOCYTE CHEMOATTRACTANT PROTEIN-1 AS BIOMARKERS FOR LUPUS NEPHRITIS IN COLOMBIAN SLE PATIENTS

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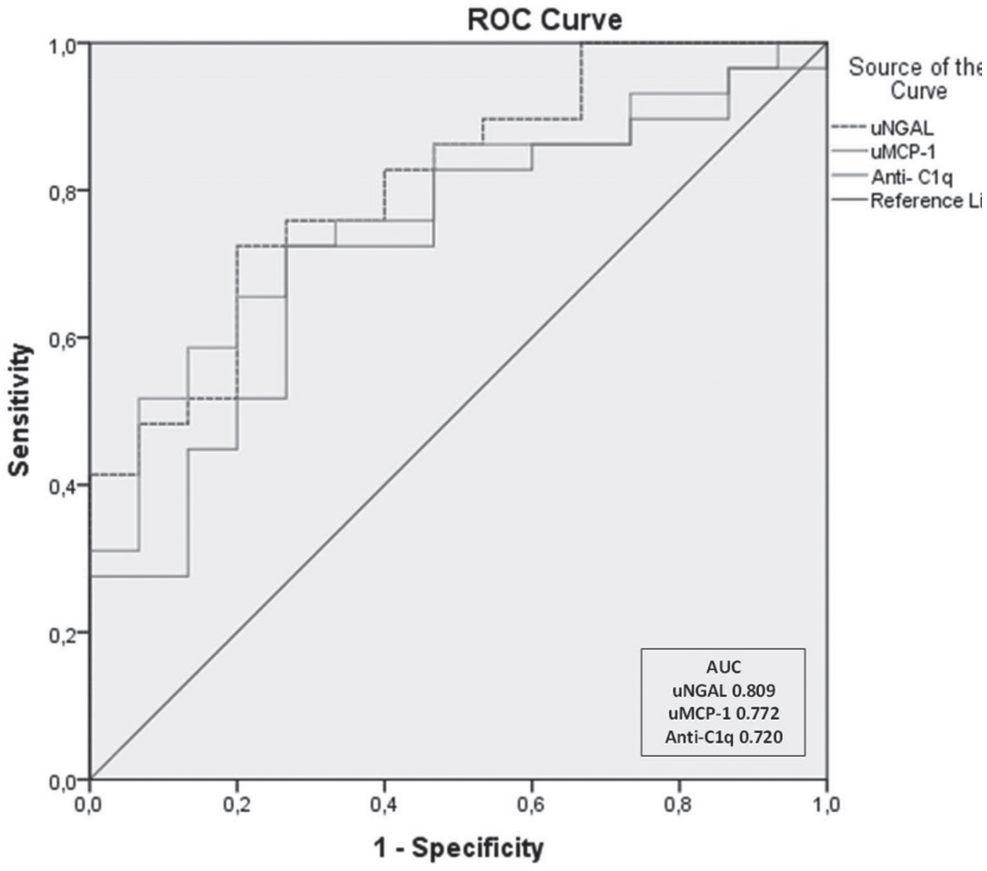
**Background** Some previous studies in Caucasian, Asian, and African-American patients have shown that urine levels of Neutrophil Gelatinase–Associated Lipocalin (uNGAL) and Monocyte Chemoattractant Protein-1 (uMCP-1) were significantly greater in patients with LN. However, information in Mestizo and Afro-Latin American patients is very limited. Our aim was to evaluate diagnostic value of uNGAL and uMCP-1 as potential markers for the diagnosis of LN in Colombian SLE patients
**Materials and methods** We examined urinary levels of NGAL and MCP-1 in 93 consecutive SLE patients (ACR criteria 1982) from Hospital San Vicente Fundación, at Medellín, Colombia. uNGAL and uMCP-1 were measured by ELISA techniques (R&D system, Minneapolis, USA). In addition, serum Anti-C1q antibodies were measured (Inova, San Diego, USA). Several clinical and serological features were analysed as well as disease activity (SLEDAI). Mann-Whitney tests were used to compare data and Spearman's rho for correlations. Additionally, ROC curves relating the specificity and sensitivity profiles of the 2 biomarkers were done.




**Abstract CE-06 Figure 1** Receiver operating characteristic (ROC) curve of urinary NGAL, MCP-1 and anti C1q for the identification of LN (dotted line for uNGAL, solid green line for uMCP-1 and solid red line for anti C1q)

**Results** Ninety-three SLE patients were recruited (88% female) with median age of 33.6 ± 12.4 years and median disease duration of 11.5 ± 14.8 years. Mestizo (75%) and Afro-Latin American (22%) were majority. One quarter of patients had an early SLE (< 2 years of duration) and 64 were admitted at the time of urine collection. Hematologic disease (89%), arthritis (83%), cutaneous involvement (82%), and renal disease (66%) were among most common manifestations. 63% of patients were positive for anti-C1q. We found significant positive correlation between uNGAL levels and SLEDAI ($r = 0.331$, $p = 0.02$) and between uMCP1 with SLEDAI ($r = 0.428$, $p < 0.02$) and with uNGAL ($r = 0.467$, $p < 0.0001$). uNGAL and uMCP-1 were significantly higher in patients with LN than in patients without LN (53.0 ± 56.3 vs 16.0 ± 16.6 pg/ml, $p = 0.001$ and 2340.4 ± 4521.4 vs 472.4 ± 596.5, $p = 0.015$, respectively). uNGAL levels were also significantly higher in patients with active LN (>500 mg proteinuria/24 hrs) than in inactive LN (66.1 ± 61.9 vs 9.0 ± 8.6, $p < 0.001$). A ROC curve constructed for uNGAL, uMCP-1, and anti-C1q for LN in all SLE patients showed a good level of sensitivity and specificity (Figure 1).

**Conclusions** Colombian LN patients had 4 times and 5 times higher levels of uNGAL and uMPC-1, respectively than patients without LN. Additionally, uNGAL was significantly higher in patients with active LN. Both markers were correlated with disease activity. A multinational prospective study is ongoing under GLADEL cohort, in order to evaluate those biomarkers in 14 Latin American countries.

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## CE-07 SENSITIVITY OF LUPUS CLASSIFICATION CRITERIA FOR SPECIALIST-DIAGNOSED SYSTEMIC LUPUS ERYTHEMATOSUS IN A POPULATION-BASED REGISTRY OF AMERICAN INDIAN/ALASKA NATIVE PEOPLE

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**Background** The Indian Health Service Lupus Registry previously reported a high prevalence of systemic lupus erythematosus (SLE) among American Indian/Alaska Native populations. SLE was defined based on having documentation in the medical record of the American College of Rheumatology (ACR) classification criteria. The SLICC criteria have recently been developed for SLE. The Boston weighted criteria were previously developed for epidemiologic studies. The primary aim of this analysis is to compare the sensitivity of the ACR, SLICC, and Boston weighted criteria for specialist-diagnosed SLE in this population-based registry.

**Materials and methods** We included all individuals in the IHS Lupus Registry with a documented specialist diagnosis of SLE in