THE RENAL ACTIVITY INDEX FOR LUPUS IDENTIFIES AND PREDICTS COMPLETE RENAL REMISSION OR ABSENCE OF KIDNEY INVOLVEMENT IN SLE

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Background

Effective, non-invasive disease activity and treatment response assessments are needed for patients with systemic lupus erythematosus (SLE), especially if associated with kidney disease, i.e. lupus nephritis (LN). The treatment goal of LN is the achievement of complete renal remission (CRR), and otherwise unexplained proteinuria of > 0.5 gram can prompt a kidney biopsy to diagnose LN. The Renal Activity Index for Lupus (RAIL) measures the degree of kidney inflammation. The RAIL-score is calculated from the creatinine-adjusted RAIL biomarkers (NGAL, KIM-1, MCP-1, adiponectin, hemopexin, ceruloplasmin) and higher scores indicate higher kidney inflammation.

Objetives

1 Evaluate the role of RAIL to distinguish CRR status and identify the cut-point for RAIL.

2 Evaluate the role of RAIL in predicting change in CRR status over time.

Methods

Urine samples collected from 69 SLE adult patients (pts) with and without LN were studied longitudinally at enrollment into the GLADEL cohort (T0), at 6 months (T1) and 12 months (T2). Absolute and changes in RAIL-scores over time were assessed for presence of CRR status [proteinuria of < 0.5 grams] by logistical regression models. The Youden Index optimal cut-points on the ROC curves were calculated.

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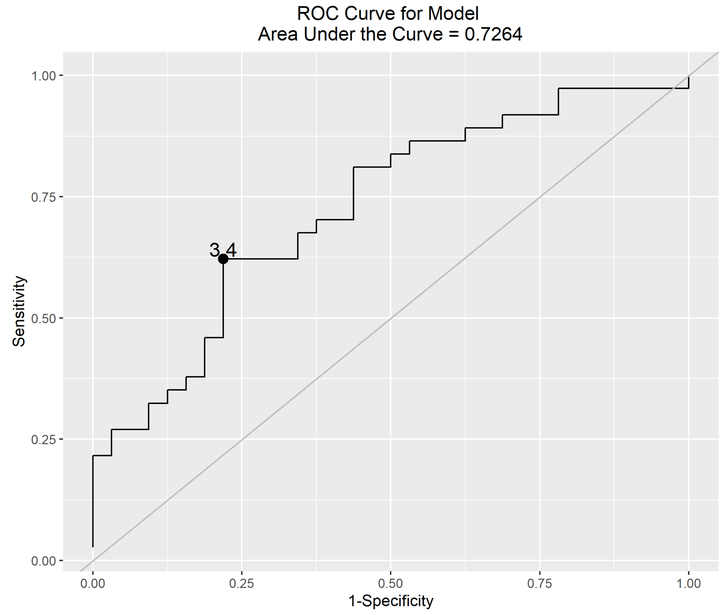
Results

For 186 visits from 51 (74%; 91% female) pts with LN and 18 (26%) pts without diagnosis LN. Pts characteristics and disease courses are shown in Table 1. RAIL-scores were correlated with renal-SLEDAI (r=0.46; p<0.0001) and proteinuria (r=0.37; p=0.002). Considering all visits (CRR present/absent=146/40), mean+SD RAIL-scores with CRR-status were 1.17+1.53 lower (p=0.023; area under the ROC curve =0.73) than without CRR. As shown in Figure 1 and scores of >3.4 identified CRR-status with 78% specificity (PPV=0.77, sensitivity =62). Pts who newly attached CRR-status at the next visit had a RAIL-score decrease of 1.0+1.524 since the last visit (p=0.0024) and a decrease of >0.57 had a PVV of 82% of achieving CRR at the next visit.

TABLE 1
Patient characteristics & RAIL-scores over time

Variable	T0 (n=69)	T1 (n=58)	T2 (n=59)
Complete Renal Response, n (%)	37 (54)	51 (88)	55 (93)
RAIL-Cr score	3.74 (2.72, 4.88)	3.47 (2.47, 4.12)	3.46 (2.43, 4.62)
Time at diagnosis (months), median (Q1, Q3)	28 (21-36)		
Age at cohort entry (years), median (Q1, Q3)	37 (25-44)		
Ethnicity Caucasian / Mestizo, n (%)	10 (15.5%) / 58 (84%)		
Proteinuria	0.36 (0.12, 1.7)	0.16 (0.1, 0.3)	0.13 (0.1, 0.29)
Hematuria	19 (28%)	7 (12%)	3 (5%)
C3 / C4, low	61 (88%)/ 57 (83%)	14 (24%)/15 (26%)	16 (27%)/18 (31%)
SLEDAI total score (range)	6 (2, 13)	2 (0, 4)	2 (0, 4)
SDI total score (range)	0 (0, 1)	0 (0, 1)	0 (0, 1)
Treatments n (%)			
ACE/ARB	37 (54%)		
Azathioprine	9 (13%)		
Prednisone / Steroids pulses	56 (81%) /12 (17%)		
Antimalarials	65 (94%)		
Cyclophosphamide	9 (13%)	12 (21%)	4 (7%)
Mycophenolate mofetil	24 (35%)	21 (36%)	34 (58%)
Tacrolimus	3 (4%)	2 (3.5%)	4 (7%)

FIGURE 1



Conclusion

RAIL-scores are significantly lower with CRR-status in SLE and decreases of 1.0 between visits > 0.57 or larger predict future CRR achievement.