Conclusions Systemic disease activity may drive neuronal affliction in SLE patients, even in the absence of overt NP-symptoms. Hence, controlling SLE disease activity is crucial for achieving better cerebral outcomes.

P60 PERFORMANCE OF SLE-DAS TO ASSESS SUBCUTANEOUS BELIMUMAB EFFICACY IN A COHORT OF SYSTEMIC LUPUS ERYTHEMATOSUS PATIENTS

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Objective The assessment of disease activity in patients with Systemic Lupus Erythematosus (SLE) represents an essential need for clinical practice and clinical trials. Nevertheless, the validation of a sensitive and reproducible instrument remains a challenge for the rheumatologist due to SLE heterogeneity. SLE-DAS (SLE Disease Activity Score), a recently proposed index, demonstrated higher sensitivity to change in comparison to SLEDAI-2k. However, few studies have tested its performance in the assessment of treatment efficacy. Thus, we aimed at assessing the efficacy of subcutaneous (sc) belimumab (BLM) by SLE-DAS in a monocentric SLE cohort. In particular, we evaluated the achievement of remission according to SLE-DAS and DORIS definition. Secondly, we investigated the construct validity of SLE-DAS in comparison with SLEDAI-2k.
Methods We evaluated SLE patients treated with sc BLM from March 2019. Disease activity has been assessed by SLEDAI-2k, SLE-DAS and PGA (Physician Global Assessment) in all the established time-points [baseline (T0), after 1 (T1), 3 (T3), 6 (T6) and 12 (T12) months]. Furthermore, we applied and compared the achievement of remission according to SLE-DAS values (SLE-DAS ≤2.08 + PDN ≤5mg/daily) and DORIS definition (clinical SLEDAI-2k=0 + PGA<0.5 + antimalarials treatment, PDN≤5mg/daily, stable immunosuppressive treatment).
Results We enrolled 86 patients [M/F 5/81, median age 48 years (IQR 17.5), median disease duration 166 months (IQR 216)]. At baseline, median values of SLEDA-2k and SLE-DAS were 6 (IQR 4) and 5.77 (IQR 4.33), respectively, and they significantly correlated (r=0.719, CI 95% 0.586–0.815, p<0.0001; figure 1A). Median duration of treatment was 14 months (IQR 20). We found a significant reduction of SLE-DAI-2k and SLE-DAS already at T1, maintained in the subsequent time-points (p<0.0001). At T12, a remission state was achieved by 60.4% of patients according to SLE-DAS definition and by 62.3% according to DORIS one (figure 1B). The two definitions of remission have demonstrated an agreement of 84%, with a Cohen's kappa equal to 0.6.
Conclusions In this study we applied SLE-DAS to assess the efficacy of sc BLM, by analyzing its over-time changes and by comparing its performance with SLEDAI-2k. Indeed, our results suggest the usefulness of this new activity index in a real-life setting.

P61 HARNESSING MACHINE LEARNING TO PREDICT NEUROPSYCHIATRIC EVENTS IN SYSTEMIC LUPUS ERYTHEMATOSUS

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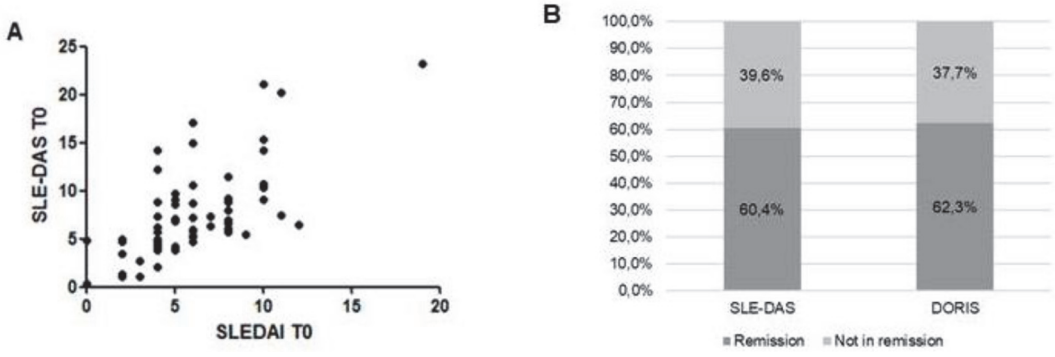
Objective Neuropsychiatric systemic lupus erythematosus (NPSLE) is linked to increased morbidity, mortality, and adverse health-related quality of life. Early disease, a history of NPSLE, antiphospholipid antibody positivity, and high disease activity are considered risk factors for NPSLE. However, there is currently no clinical tool for predicting neuropsychiatric flares. We aimed to assess the effectiveness of machine learning (ML) in predicting NPSLE flares within a large cohort of patients with active SLE, yet no active severe NPSLE.
Methods We analysed data from five phase III trials (BLISS-52, BLISS-76, BLISS-NEA, BLISS-SC, and EMBRACE) after excluding patients with baseline neuropsychiatric British Isles Lupus Assessment Group (BILAG) score A (N=3638). Neuropsychiatric flares were defined as a transition from BILAG score C, D, or E to score A or B, or from score B to score A in the neuropsychiatric domain of the classic BILAG index



Abstract P60 Figure 1 (A) Correlation analysis by Spearman test between SLEDAI-2k and SLE-DAS at baseline (r=0.719, p<0.0001). (B) Stacked column chart for remission states according to SLE-DAS and DORIS definitions

throughout a 52-week long follow-up. After constructing panels of variables based on knowledge, we employed ML to develop predictive models utilising the least absolute shrinkage and selection operator (LASSO) and logistic regression. A stratified split was applied to partition the study population into a training (70%; N=2547), and a test set (30%; N=1091). The training set was used in model development while the internal validation was developed by a 10-fold cross validation. The test set was used for validating the built model.

Results A total of 105 SLE patients (2.89%) experienced a neuropsychiatric flare during follow-up. Knowledge-driven feature selection included a history of NPSLE, disease duration, anticardiolipin positivity, clinical Systemic Lupus Erythematosus Disease Activity Index 2000 (SLEDAI-2K), sex, age, and the use of antimalarials. Both classifiers demonstrated comparable performance, with an AUC of 0.80 and 0.80, sensitivity of 0.61 and 0.61, and specificity of 0.83 and 0.82, respectively.

Conclusions The integration of traditional risk factors for NPSLE into ML-based models can predict neuropsychiatric involvement in SLE with high specificity and modest sensitivity. We herein propose a pragmatic, robust, and highly accurate prediction tool forecasting neuropsychiatric flares in SLE patients. The utilisation of this ML-based tool holds promising prospects for improving patient care and outcomes in real-world settings.

Conflicts of Interest IP has received research funding and/or honoraria from Amgen, AstraZeneca, Aurinia, Bristol Myers Squibb, Elli Lilly, Gilead, GlaxoSmithKline, Janssen, Novartis, Otsuka, and Roche. The other authors declare that they have no conflicts of interest related to this work. The funders had no role in the design of the study, the analyses or interpretation of data, or the writing of the manuscript.

P62 MACHINE LEARNING APPROACHES FOR PREDICTION OF RENAL FLARES IN SYSTEMIC LUPUS ERYTHEMATOSUS: KNOWLEDGE-DRIVEN MODELS OUTPERFORMED DATA-DRIVEN MODELS

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Objective Renal flares in patients with systemic lupus erythematosus (SLE) result in significant nephron loss. Thus, identification of reliable early signals of impending renal flares is anticipated to improve the prognosis for these patients. In this study, we implemented two different approaches of machine learning (ML) algorithms to identify baseline clinical determinants of renal flare occurrence in a large cohort of SLE.

Methods We analysed data from five phase III trials (BLISS-52, BLISS-76, BLISS-NEA, BLISS-SC, EMBRACE) after excluding patients with baseline British Isles Lupus Assessment Group (BILAG) A or B (N=3169). Renal flare was defined as a change from C, D, or E to A or B in the renal domain of the classic BILAG index within a 52-week long follow-up. Following construction of panels of variables using either (i) knowledge or (ii) feature selection methods, we developed ML classifiers including extreme gradient boosting (XGBoost), least absolute shrinkage and selection operator (LASSO), random forest (RF), and logistic regression. A stratified split was applied to partition the study population into a training (90%; N=2853) and a test set (10%; N=316). The training set was used in model development while the internal validation was developed by 10-fold cross validation. The test set was used for validation of the built model. Both approaches yielded final models that utilised the minimal number of features while maintaining optimal performance.

Results Of 3169 patients, 899 (28.3%) developed a renal flare during follow-up. XGBoost yielded the greatest accuracy both in the hypothesis-driven (0.97) and data-driven approach (0.88), as well as the highest performance metrics (AUC: 0.97 and 0.91; sensitivity: 1.00 and 0.82; specificity: 0.94 and 0.94, respectively) and an adequate calibration on the test dataset. The final model successfully reduced the number of features to five: renal BILAG C or D, urine protein creatinine ratio, serum albumin, blood urea nitrogen, and C3 levels.

Conclusions The knowledge-driven approach outperformed the data-driven approach which solely relied on feature selection methods. Our data suggests that the utilisation of five routine clinical parameters (proteinuria, albuminaemia, urea, C3) could be combined into accurate tool for predicting renal flares in SLE patients.

Conflicts of interest IP has received research funding and/or honoraria from Amgen, AstraZeneca, Aurinia, Bristol Myers Squibb, Elli Lilly, Gilead, GlaxoSmithKline, Janssen, Novartis, Otsuka, and Roche. The other authors declare that they have no conflicts of interest related to this work. The funders had no role in the design of the study, the analyses or interpretation of data, or the writing of the manuscript.

P63 TIME IS IMPORTANT: IMPLICATIONS OF DISEASE DURATION AND AGE FOR SYSTEMIC ERYTHEMATOSUS LUPUS NEUROIMAGING

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Objective Describe advanced and conventional Brain Magnetic Resonance Imaging (MRI) findings in Systemic Erythematosus Lupus (SLE) patients, that attended routine consultation, and identify possible factors associated.

Methods It was a cross-sectional study with forty-two SLE women (2019 EULAR/ACR criteria) that attended medical routine consultation. Brain MRI was performed on 1.5T system, including conventional sequences, diffusion tensor imaging (DTI), MR spectroscopy and MRI angiography without gadolinium (3D Time of Flight). The disease activity and cumulative organ damage were evaluated by SLEDAI and SLICC/ACR damage index. MRI dataset was blindly evaluated by two experienced radiologists. Statistical analysis was performed using JASP and Jamovi softwares.

Results Most of the patients did not have activity disease with neuropsychiatric alterations and have no irreversible organ damage, with SLEDAI less than 8 (70.73%) and SLICC = 0 (75.61%). White Matter Hypersignal Foci (WMHF) was the most frequent finding (61.9%), followed by brain atrophy (38.1%). Artery stenosis occurred in 14.29%, cerebral chronic