PhD student:
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Research project:
Use of Advanced Echocardiography and Metabolomic Profiling to Monitor Disease Evolution in Patients with Systemic Lupus Erythematosus (SLE)

Abstract:
Introduction
Cardiac involvement is a leading cause of morbidity and mortality in systemic lupus erythematosus (SLE). Echocardiography is a pivotal, non-invasive tool for detecting, assessing and following cardiac abnormalities in these patients. Although isolated studies have linked individual echocardiographic parameters to disease activity, reliable markers that track long-term clinical progression and the evolution of cardiovascular risk remain lacking.
Aims
To identify advanced echocardiographic parameters and plasma metabolomic signatures associated with long-term, system-wide progression of SLE.
To determine whether these parameters and profiles can predict an unfavourable clinical course, quantified by cumulative damage (Systemic Lupus International Collaborating Clinics Damage Index, SLICC–SDI) and by an increase in cardiovascular risk.
Methods
Study design: Prospective cohort with two assessments (baseline and 6-year follow-up).
Population: Consecutively enrolled patients with a confirmed diagnosis of SLE attending our centre.
Data collection:

- Clinical: Organ involvement attributable to SLE and traditional cardiovascular risk factors.
- Laboratory: Disease-specific autoantibodies, lipid profile, blood-pressure measurements.
- Therapy: Type and dosage of immunosuppressants and corticosteroids.
- Echocardiography: Three-dimensional right-ventricular study (fractional area change, RV ejection fraction, septal and free-wall strain).
- Metabolomics: Plasma profiling by mass spectrometry.

Statistical analysis: Correlations between echocardiographic/metabolomic variables and changes in SLICC–SDI; multivariable regression models to identify independent predictors of clinical and cardiovascular worsening.
Results
Data analysis is currently underway to explore the potential relevance of the investigated parameters.