

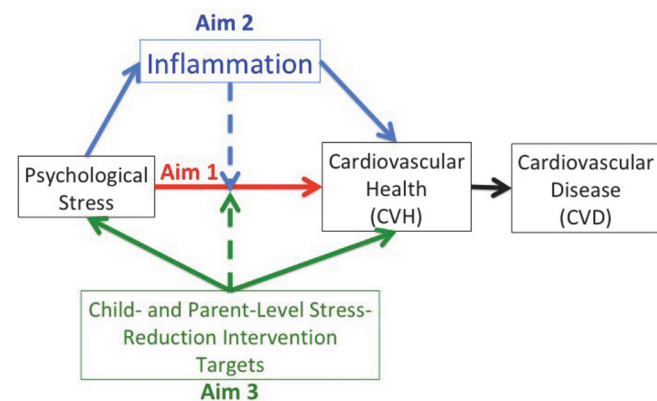
## Lupus 21<sup>st</sup> Century 2022 Meeting Abstract Cardiovascular Disease and Lupus

### 502 PSYCHOLOGICAL STRESS AND CARDIOVASCULAR HEALTH IN JUVENILE LUPUS AND DERMATOMYOSITIS

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10.1136/lupus-2022-lupus21century.19

**Background** The American Heart Association (AHA) has defined 7 protective factors comprising ideal cardiovascular health (CVH), a positive health construct whose maintenance in childhood and young adulthood predict markedly reduced rates of cardiovascular disease (CVD) events in middle-age. In the general population, suboptimal CVH is observed in 58% of individuals by young adulthood and is associated with increased carotid intimal media thickness (cIMT) - a predictor of CVD. For youth with juvenile systemic lupus erythematosus (JSLE) and juvenile dermatomyositis (JDM), risk of premature CVD is even more pronounced. The Atherosclerosis Prevention in Pediatric Lupus Erythematosus (APPLE) trial demonstrated that carotid intimal media thickness (cIMT) progresses faster in JSLE than familial dyslipidemia. Both traditional CVD risk factors and disease-related variables (e.g. chronic inflammation, endothelial dysfunction) likely underlie why patients with JSLE and JDM follow worse CVH trajectories than the general population. Potentially augmenting the impact of biological disease-related variables on CVH in youth with JSLE and JDM is psychological stress, which can negatively impact long-term CVH trajectories by triggering systemic inflammation and endothelial dysfunction. Children with rheumatic diseases experience significant psychological stress related to their health condition, with up to half of JSLE and JDM patients warranting professional mental health referral. We hypothesize that the high stress and inflammation of JSLE/JDM create a “perfect storm” that leads to early loss of CVH, compounding CVD risk. Stress is a modifiable risk factor amenable to intervention, but optimal intervention targets have not yet been identified in JSLE/JDM.



**Abstract 502 Figure 1** Conceptual model showing that stress and inflammation deplete CVH while stress-reduction can preserve CVH. As CVH is depleted, CVD risk increases over the life course.

**Methods** We are conducting a 2-site (Duke, UNC) prospective observational study with the following three aims: (1) Prospectively assess the association of psychological stress and CVH indicators in JSLE/JDM patients; (2) Prospectively quantify the mediating effect of inflammation on psychological stress and CVH in JSLE/JDM patients; and (3) Identify optimal stress-reduction intervention targets that moderate the impact of psychological stress on CVH in JSLE/JDM patients (figure 1).

**Results** Data/specimen collection is ongoing, with 53 participants enrolled in the study to date and planned follow up for 1 year for study participants. Cross-sectional analyses of baseline data are planned in early 2023, followed by analysis of the full longitudinal dataset in late 2023/early 2024.

**Conclusions** Successful completion of this study will produce quantitative support for a novel, generalizable framework relating stress, inflammation, and CVH in JSLE/JDM and other pediatric-onset rheumatic diseases. Additionally, preliminary study data will inform development and pilot testing of stress-reduction interventions to improve CVH in JSLE/JDM.

**Lay Summary** Juvenile lupus (JSLE) and dermatomyositis (JDM) patients are at high risk of cardiovascular disease. The American Heart Association has defined ‘cardiovascular health’ (CVH) as the factors that can protect against heart attack, stroke, and other cardiovascular diseases. Studies show that JSLE/JDM patients have worse CVH than children and adolescents who do not have these conditions.

Recent studies show that stress can worsen CVH, partly by increasing inflammation, but this has not been studied yet in JSLE/JDM. In this study, we will assess stress, inflammation, and CVH in JSLE/JDM patients over 1 year to determine if stress triggers inflammation and worsens CVH. We will also evaluate factors that might prevent stress from negatively affecting inflammation and CVH.

### 503 STRESS AND DISCRIMINATION PREDICT CARDIOVASCULAR DISEASE IN A POPULATION-BASED COHORT WITH SYSTEMIC LUPUS ERYTHEMATOSUS

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10.1136/lupus-2022-lupus21century.20

**Background/Purpose** Stress is known to contribute to the development of atherosclerosis in the general population. African American (AA) people are more likely to experience psychosocial and environmental stressors and are three times more likely to develop systemic lupus erythematosus (SLE) than White people.

Cardiovascular disease (CVD) is a leading cause of SLE morbidity and mortality. However, the increased CVD risk is not completely attributable to disease activity and traditional risk factors. We examined if psychosocial stress predicts CVD in SLE.

**Methods** Georgians Organized Against Lupus (GOAL) is a population-based cohort of validated SLE patients in Atlanta, Georgia supported by the Centers for Disease Control and Prevention. Sociodemographic information, disease factors, CVD risk factors and social determinants of health measures were collected at baseline in 2016. Potential CVD events were identified by participant report and by matching with the