Clinical pathology selected abstracts

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Association of sickle cell trait with incidence of CHD in African-Americans

April 2021—The incidence of cardiovascular disease and coronary heart disease is disproportionately higher among African-Americans compared with non-Hispanic whites. It has been hypothesized that genetic variation is associated with these higher rates of cardiovascular disease (CVD) and coronary heart disease (CHD) among this race. The heterozygous state for the sickle cell variant or sickle cell trait may be associated with the higher risk of CHD in African-Americans. Several studies have shown that, as with the *APOL1* gene variant, the sickle cell variant (sickle cell trait [SCT]) is associated with the incidence and progression of chronic kidney disease and albuminuria, both of which are associated with CVD. The authors conducted a study to determine if African-Americans with SCT had a higher risk of myocardial infarction (MI) or CHD after adjusting for other risk factors associated with the latter. They conducted a large prospective cohort study of African-Americans who had participated in five population-based studies: the Women's Health Initiative, Reasons for Geographic and Racial Differences in Stroke, Multi-Ethnic Study of Atherosclerosis, Jackson Heart Study, and Atherosclerosis Risk in Communities. The follow-up periods for the studies had spanned various ranges between 1993 and 2016. Data analysis was conducted between October 2013 and October 2020. The study participants were evaluated using direct genotyping or high-quality imputation of rs334 (the sickle cell variant) to confirm the sickle cell trait. Participants were excluded from the analysis if they had sickle cell disease or a history of CHD. The authors used questionnaires, physical examinations, and physiological assessments at baseline that had been collected from the five studies in their analysis. Factors associated with CHD were recorded. The main outcomes of the study were incident MI, which was defined as adjudicated nonfatal or fatal MI, and incident CHD, which was defined as adjudicated nonfatal MI, fatal MI, coronary revascularization procedures, or death due to CHD. The authors also used Cox proportional regression models to estimate the hazard ratio for incident MI or CHD in SCT carriers compared with noncarriers. The study included 23,197 African-American men (29.8 percent) and women (70.2 percent), of whom 1,781 (7.7 percent) had SCT. A meta-analysis of the five studies showed that SCT was not significantly associated with MI (hazard ratio, 1.03) or composite CHD outcome (hazard ratio, 1.16). The authors concluded that SCT was not associated with an increased risk of fatal and nonfatal MI or CHD. To their knowledge, this is the largest study to examine the association between SCT and incidence of MI and CHD. The authors noted that these data may be useful in the workup of patients who have SCT and present with CHD symptoms.

Hyacinth HI, Franceschini N, Seals SR, et al. Association of sickle cell trait with incidence of coronary heart disease among African American individuals. *JAMA Network Open*. 2020;4(1). doi:10.1001/jamanetworkopen.2020.30435

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Hematologic indices as predictive parameters for systemic lupus erythematosus

Systemic lupus erythematosus is a chronic inflammatory disease caused by an autoantibody that is formed against nuclear and cytoplasmic antigens. It results in periods of exacerbation and remission, so predicting a patient's disease activity is critical to assessing therapeutic treatment options. Because SLE affects multiple organs, it can be challenging to monitor variations in disease activity over time. Furthermore, there are no reliable laboratory tests to measure SLE disease activity. The authors conducted a study to identify novel biomarkers that could more accurately assess SLE disease activity and progression. Lymphocytes and neutrophils have been identified as biomarkers of inflammation in several disease states, including autoimmune diseases. The study assessed the neutrophil-to-lymphocyte ratio (NLR), platelet-to-lymphocyte ratio (PLR), mean platelet volume (MPV), platelet distribution width (PDW), and red cell distribution width (RDW) in SLE patients and their correlation with disease

activity. The authors recruited 208 subjects between the ages of 18 and 55 years who were diagnosed with SLE and 205 sex- and age-matched healthy control subjects. The patients' disease activity was assessed using the SLE disease activity index 2000 (SLEDAI-2K). Patients were classified into three groups based on the index: inactive (SLEDAI-2K, <6), moderately active (SLEDAI-2K, 6–10), and highly active (SLEDAI-2K, ≥11) SLE disease. Hematological specimens were then analyzed for each participant. The results showed that the lymphocyte and platelet counts were significantly lower in SLE patients than in control subjects. However, the NLR, PLR, and RDW were significantly higher. Furthermore, the neutrophil counts, NLR, and PLR were significantly higher in the highly active and moderately active SLE patients than in those with inactive disease, but the lymphocyte count was significantly lower. Based on receiver operating characteristic area under the curve analyses, the lymphocyte count and PLR were significantly higher than the platelet count, NLR, MPV, PDW, and RDW. To the authors' knowledge, this research is the largest study to date that examines hematological parameters as a biomarker of SLE. The authors concluded that the lymphocyte count and PLR can be used to predict active SLE with better sensitivity and specificity than other hematological parameters. Therefore, PLR may be considered a biomarker for predicting SLE disease activity. The authors stated that prospective longitudinal studies are needed to better define changes in hematological parameters at different levels of SLE disease activity.

Peirovy A, Mahdavi AM, Khabbazi A, et al. Clinical usefulness of hematologic indices as predictive parameters for systemic lupus erythematosus. *Lab Med*. 2020;51:519–528.

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