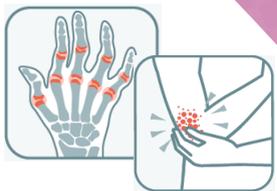


Are Blood Metabolites Useful for Predicting Cardiovascular Events in Patients with Psoriatic Arthritis and Psoriasis?

✦✦ We identified potential biomarkers that may offer early mechanistic clues leading to cardiovascular events



Findings:

1

We identified a range of metabolites in biochemical pathways associated with higher cardiovascular risk, offering novel insights into the metabolic nature of atherosclerosis and psoriatic disease

In ~1,000 patients with psoriatic disease, a targeted metabolomics platform was used to quantify 68 metabolite measures, including:



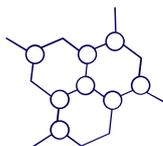
Lipoproteins



Amino acids



Fatty acids



Glycolysis precursors



Ketone bodies

2

Apolipoprotein B, glycoprotein acetyls and the amino acid phenylalanine are associated with increased cardiovascular risk, whereas the **amino acids tyrosine and alanine, and omega-3 fatty acids** are associated with decreased risk. We summarized their potential underlying mechanisms and their link to obesity, diabetes and kidney disease, which are common in patients with psoriatic disease

3

A combined model that included **13 metabolite biomarkers in addition to age and sex** performed well in predicting cardiovascular risk in patients with psoriatic disease



Targeted Metabolomic Profiling and Prediction of Cardiovascular Events: A Prospective Study of Patients with Psoriatic Arthritis and Psoriasis

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Objective: In patients with psoriatic disease (PsD), we sought serum metabolites associated with cardiovascular (CV) events and investigated whether they could improve CV risk prediction beyond traditional risk factors and the Framingham Risk Score (FRS).

Methods: Nuclear magnetic resonance metabolomics identified biomarkers for incident CV events in patients with PsD. The association of each metabolite with incident CV events was analyzed using Cox proportional hazards regression models first adjusted for age and sex, and subsequently for traditional CV risk factors. Variable selection was performed using penalization with boosting after adjusting for age and sex, and the FRS.

Results: Among 977 patients with PsD, 70 patients had incident CV events. In Cox regression models adjusted for CV risk factors, alanine, tyrosine, degree of unsaturation of fatty acids, and high-density lipoprotein particles were associated with decreased CV risk. Glycoprotein acetyls, apolipoprotein B, and cholesterol remnants were associated with increased CV risk. The age- and sex-adjusted expanded model with 13 metabolites significantly improved prediction of CV events beyond the model with age and sex alone, with an area under the receiver operator characteristic curve (AUC) of 79.9 vs. 72.6, respectively ($p=0.02$). Compared to the FRS alone (AUC=73.9), the FRS-adjusted expanded model with 11 metabolites (AUC=75.0, $p=0.72$) did not improve CV risk discrimination.

Conclusions: We identify novel metabolites associated with the development of CV events in patients with PsD. Further study of their underlying causal role may clarify important pathways leading to CV events in this population.