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Cardiovascular disease-specific proteomics of Korean patients with atopic dermatitis reveal distinct proteomic signatures

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Introduction & Objectives: Cardiovascular diseases (CVDs) have been found to be associated with atopic dermatitis (AD) in Korean patients. This study aimed to characterize the blood proteomic signature in Korean patients with moderate to severe AD, by focusing on proteins related to CVDs.

Materials & Methods: A total of 78 patients with AD and healthy controls were enrolled. The patients were clinically assessed for eczema area and severity index (EASI) scores. Patient blood proteomics were collected using the Olink CVD II panel. The functions of the proteins were examined through gene ontology (GO) and pathway analyses. Protein expression levels were visualized on the heatmap. AD proteomics and control proteomics were compared using the principal component analysis (PCA). Correlation and multiple linear regression analyses were performed to examine correlations among protein expression levels and the association between the disease severity and the protein expressions, respectively.

Results: The CVD II panel incorporated proteins involved in PI3K-Akt, ERK1, and ERK2 pathways. The unsupervised hierarchical clustering and subsequent analyses yielded 39 upregulated and 10 downregulated proteins. Ninety-two proteins, as well as 39 upregulated and 10 downregulated proteins, could distinguish AD patients from healthy subjects in the PCA and clustering analyses. Twenty-five upregulated proteins, such as MMP12, CCL17, IL6, IL-1R2, and FGF21, were highly correlative in the correlation analysis. STK4, ITGB1BP2, and DECR1 were newly found to be upregulated in Korean patients with moderate to severe AD. A multiple linear regression model comprising CCL17 and FGF21 highly correlated with the EASI score (R = 0.619).

Conclusion: The blood proteomics of Korean patients with moderate to severe AD were readily distinguished from those of the healthy volunteers with the CVD II panel. Some CVD-related proteins were newly found to be upregulated in Korean AD patients.