New study provides insight into blood signatures of inflammation

May 8 2018

A new study from Boston University Schools of Medicine (BUSM) and Public Health (BUSPH) identifies a pattern of inflammation associated with cardio-metabolic risks among participants in the Black Women's Health Study, as well as two independent groups of vulnerable women. These findings could help underserved patients benefit from precision medicine and personalized profiles of disease risk.

According to the researchers, body mass index alone is an imperfect measure of obesity-associated disease risks, such as for Type 2 diabetes, because there are some individuals with chronic obesity who are apparently protected from cardio-metabolic complications and lean individuals with high cardiovascular and diabetes risks. Abnormal, unresolved inflammation in blood and adipose (fat) tissue, rather than obesity per se, is thought to be important for development of disease. Certain biomarkers show promise in predicting obesity-associated diabetes risk; however, the clinical utility of single biomarkers is limited for complex disease phenotypes such as these.

The research team took a data-driven, systems biology approach to discover six cytokine signatures associated with Type 2 diabetes risk in a vulnerable population: African American women with obesity and varying degrees of metabolic health. These six distinct signatures are patterns of sixteen cytokines/chemokines that promote or reduce inflammation.

Analyses of plasma samples from participants in the Black Women's

Health Study, formed the basis for the discovery dataset, which was then validated in two separate groups, African American women volunteers with obesity who had donated plasma to the Komen Tissue Bank, and African American women with obesity who were breast reduction surgical patients at a safety net hospital in Greater Boston. The patterns or signatures in the validation cohorts closely resembled the distributions in the discovery cohort.

"These findings are highly relevant to an understudied and underserved population that experiences elevated risks for co-morbidities of obesity. The overall impact of this report is high because of the potential utility of the new signatures just discovered and validated, which could assist clinical decision making with more personalized information," explained corresponding author Gerald V. Denis, PhD, associate professor of pharmacology and medicine at BUSM.

These findings appear in the journal *PLOS ONE*.

Provided by Boston University School of Medicine