PANEL SUMMARY

PANEL SUMMARY: THE REVOLUTION IN RISK ASSESSMENT AND DISEASE DETECTION: IMPLICATIONS FOR POPULATION SCIENCE

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SUMMARY

Obesity has reached epidemic proportions and complications related to obesity contribute substantially to both health care costs and mortality. Obesity, particularly when accompanied by an excess of visceral/ectopic fat, is a major risk factor for diseases ranging from insulin resistance, type 2 diabetes, nonalcoholic fatty liver disease, and cardiovascular disease.[1-5] Also, coronary atherosclerosis is another important risk factor associated with obesity and proved to be a predictor for cardiovascular disease (CVD) across ethnic groups.[6] Accordingly, risk for obesity and its assessments should be considered by utilizing the existing JHS data to its fullest, especially with the rich computed tomography (CT) and magnetic resonance imaging (MRI) datasets.

The benefits of utilizing biomarkers include: 1) enable faster, efficient clinical trials for life-saving or health-promoting interventions; 2) help inform healthy diet choices; 3) enable tracking of health concerns and decisions about care.

Panel Recommendations

1. Imaging structural biomarkers, such as body fat distribution and coronary calcification, is a unique tool to examine the association of different obesity phenotypes with the development of CVD. It will help to identify individuals with or without high cardiovascular risk.[7] Also, prospective studies should be considered to evaluate the power of these fat depots in the prediction of cardiovascular disease in African Americans.[8]

2. Examine body fat distribution in relation to cardiovascular outcomes in the JHS as compared to other study cohorts to address health disparities in CVD.[9]

3. Atherosclerosis, defined by coronary calcium score, should be considered in prediction of CVD events for African Americans.[10]

4. A lower adiponectin (ADPN) level is associated with increased left ventricular mass and geometry. More study is needed on how ADPN will perform longitudinally.

5. Pericardial adipose tissue (PAT) is a biomarker of visceral adipose tissue, which is significantly correlated with most cardiometabolic risk factors. PAT may exert a local effect on the coronary vasculature.

6. Imaging heart function, myocardial functions defined by MRI, can help gain more information to predict CVD events.[11] In addition, MRI can be more accurate and can enable earlier detection of myocardial structural and functional abnormalities .[11]

7. JHS has measured many biomarkers, including serum and urine, which can be used to characterize surrogate endpoints in disease, health, nutrition or nutrition intervention to reduce disease risk or health-related conditions.

8. Recommendations from the Institute of Medicine *Report on Evaluation of Biomarkers and Surrogate End Points in*

Chronic Disease that emerged after two years of study by a 12-member panel include:

1) the use of an evaluation framework emphasizing 3 steps:

   a. Analytical validation: evidence on the analytical performance of the assay.
   b. Qualification: evidence on association between disease and biomarkers.
   c. Utilization: determination of whether validation and qualification conducted provide sufficient support for the use proposed and the applicability of available evidence to this use

2) Scientific process harmonization; and
3) Improving evidence-based regulation.[12]

Challenges

1. Harmonize JHS protocols with other African American studies to facilitate data comparisons.
2. Determine the advantages of biomarkers, eg, objective assessment, measurement precision, validation and reliability vs the costs.
3. Understand limitation of biomarkers. A biomarker may be associated with outcomes through multiple pathways but not impact the clinical outcomes. So biomarkers are good for primary intervention but not for secondary intervention.[13]

JACKSON HEART STUDY ADVANTAGES

1. The wealth of historical, baseline and longitudinal data, combined with genetic and imaging data, make the JHS a national research platform for an understudied, high-risk population. The richness of phenotype/genotype data would be difficult to duplicate in a typical clinical trial.
2. JHS is an epidemiological study in a southern African American population, which has unique social, dietary and behavioral contextual characteristics, which may not be well-accounted for in typical clinical trials.

In addition to the topics mentioned above in the conference, future JHS research and publications should focus more efficiently on how diet patterns or other non-traditional factors impact CVD outcomes in JHS participants.

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