Do We Really Need More Biomarkers?

In this issue of JACC: Heart Failure, we notice a number of important contributions in the field of biomarkers. In an effort to understand the pathophysiology, diagnostic, and prognostic value in our patients, many heart failure clinicians have come to love the value of biomarkers. Not so long ago when many of us first began to practice, biomarkers did not play a large role in the field of heart failure, nor were they often used clinically in the management of patients with heart failure. In contrast, biomarkers were the cornerstone of management for patients with acute coronary syndromes; however, this was not always the case. Imagine a time prior to most of our clinical experience, when acute myocardial infarctions were not diagnosed based on clinical evaluation and electrocardiogram, particularly in patients with non–ST-segment elevation changes, what a difficult challenge it must have been to diagnose these patients as having myocardial injury.

Fortunately, for heart failure clinicians, biomarkers have been an area of intense investigation and have resulted in important contributions to the everyday management of patients. The natriuretic peptides have emerged as one of the strongest biomarkers developed in cardiology. It has become a guideline Level 1A recommendation in the diagnosis of patients with undifferentiated dyspnea presenting to the emergency room, because of its strength of diagnostic characteristics. The natriuretic peptides have also emerged as one of the strongest covariates for predicting intermediate and long-term outcomes, often measuring as the top covariate in multivariate models, along with other important clinical phenotypic characteristics. Recently, the natriuretic peptides have been combined with clinical endpoints to form important composite clinical endpoints for phase II clinical trials and drug development. Finally, biomarkers are now a target of therapeutic interventions. Yet we continue to have significant misunderstanding regarding the heterogeneity of heart failure patients presenting to the hospital with acute decompensated heart failure or in a chronic ambulatory state. Further characterization of patients, using additional biomarkers such as troponin, or other recently FDA-approved biomarkers have allowed us to better characterize our patients, provide additional prognostic information, and perhaps begin to give us a better understanding of which patients may respond best to therapeutic interventions.

Currently, many countries across the globe have uniformly decided that device therapies such as implantable cardioverter defibrillators (ICDs) and cardiac resynchronization therapies (CRTs) cannot be deployed due to cost. This is, in large part, because of the blunt deployment of these devices, recommended purely on ejection fraction, QRS duration, and heart failure class. Think of how many lives could be saved with the development of a biomarker that could accurately predicted those who would benefit from an ICD, so countries with limited healthcare resources could use these devices in those patients who would benefit to the greatest extent. This is one of the most important areas of biomarker investigation: the role of biomarker profiling to better characterize the phenotype of patients who might best respond to therapeutic interventions whether it is drug or device therapies.

Overwhelmingly, so many of our large-scale clinical trials are neutral, several of which were presented at the ACC Scientific Sessions in San Francisco. Yet it is likely that there
are specific subgroups of patients characterized by biomarkers that may have important therapeutic responses. Without collecting DNA and biomarkers carefully in all clinical trials of therapeutic interventions, we may be discarding valuable information about therapies in targeted populations. Our oncology colleagues have advanced this strategy of a more personalized approach based on biomarkers and DNA profile for chemotherapeutic interventions to a much greater extent than we have in cardiology.

At *JACC: Heart Failure*, we are committed to publishing important investigations around biomarker development; whether to improve diagnosis, prognosis, or more importantly, determining subgroups of patients who may respond more favorably to certain therapies. We are committed to advancing this field of knowledge, so it will be easier to balance a benefit/risk ratio into the clinical setting to help improve quality and duration of life for our much needed heart failure patients.

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