Commentary

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A Note on Cardiac Biomarkers and its Advantages

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Description

A biological molecule present in blood, other bodily fluids or tissues that indicates the presence of a normal or nonspecific process, as well as a condition or illness. A biomarker can be used to assess how effectively the body reacts to a disease or therapy.

Types of biomarkers

- Diagnostic biomarker (used for early detection)
- Predictive biomarker (to infer the efficacy and toxicity of drug)
- Prognostic biomarker (to assess treatment)
- Staging biomarker (to determine the disease progression stage)

Cardio Vascular Disease (CVD) continues to be the main cause of death globally. Traditional risk factors such as age, hypercholesterolemia, hypertension, diabetes mellitus and smoking have been identified, which has improved primary CVD prevention. However, total mortality from cardiovascular disease continues to rise. Further scientific advances have resulted in the identification of a plethora of novel biomarkers linked to cardiovascular risk, including B-type Natriuretic Peptide (BNP), lipoprotein-associated phospholipase A2, N-Terminal prohormone BNP (NT-proBNP), Myeloperoxidase (MPO), troponin, C-Reactive Protein (CRP), fibrinogen, TMAO and cysstatin C.

Cardiac biomarkers are molecules found in the blood that are secreted when the heart is damaged or strained. These biomarkers are measured to assist in the diagnosis of Acute Coronary Syndrome (ACS) and cardiac ischemia, both of which are caused by inadequate blood supply to the heart. Several clinical biomarkers are now closely linked with cardiovascular events. C-Reactive Protein (CRP), cardiac Troponins I and T (cTnI and cTnT), B-type Natriuretic Peptides (BNP and NT-proBNP) and D-dimer are among the biomarkers.

Troponin is the current biomarker test of choice for identifying heart injury. Other cardiac indicators are less specific to the heart and may be raised in other circumstances, such as skeletal muscle damage. Despite the fact that these biomarkers have predictive value independent of the previously mentioned conventional risk variables, only a few have become essential diagnostic tools in medical practice. BNP and NT-proBNP have been shown in clinical trials to be useful in the diagnosis of heart failure and/or heart failure exacerbation. Troponin has been utilised as a cardiac biomarker to diagnose and stratify individuals with probable Acute Coronary Syndrome (ACS). High sensitivity CRP (hs CRP) levels in the blood have been used to predict the risk of CVD, heart attack and stroke. MPO levels in the blood have been used to predict the risk of coronary heart disease.

Advantages

- A biomarker of exposure has an advantage over a history of exposure in that it predicts the actual "internal" dosage of the exposure. This enhances precision in measuring any risk factor by including both internal and external validity when analysing the influence of the exposure on the result.
- Cardiac Risk Indicators Profile calculates the levels of cardiac risk markers in the body, which aids in the evaluation of heart function. The test also assesses lipid levels in the body, which can contribute to heart attacks or other severe cardiac diseases.

However, none of these indicators have considerably improved the differentiation between health and illness state thus far. Scientists and physicians continue to face enormous obstacles in the development of new biomarkers that may enhance CVD risk prediction, monitoring disease progression and possibly be employed as targeted therapy before clinical signs and symptoms manifest.

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